

FACULTY OF KINESIOLOGY AND PHYSICAL EDUCATION



ANNUAL RESEARCH REPORT 2013-2014



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MEET THE FACULTY.....	3	MEDIA AND MOTION LAB	20	IOVATE / MUSCLETECH LAB.....	32
2013-14 NEW MINDS.....	4	CENTRE FOR MOTOR CONTROL.....	22	HUMAN PHYSIOLOGY RESEARCH UNIT.....	35
HEALTH AND EXERCISE PSYCHOLOGY UNIT.....	6	BIOMECHANICS AND INJURY PREVENTION LAB	25	KPE RESEARCH FUNDING AWARDED – 2013-2014	36
SPORT AND PERFORMANCE PSYCHOLOGY LABORATORY	13	EXERCISE AND CARDIAC HEALTH LAB.....	26	PUBLICATIONS (2013-2014).....	38
CONCUSSION PROGRAM	14	HEALTH AND PERFORMANCE LAB	28		
CENTRE FOR SPORT POLICY STUDIES	16	MUSCLE PHYSIOLOGY LAB	30		

WELCOME

Welcome to the inaugural Research Report of the Faculty of Kinesiology and Physical Education!

In this report, we showcase the extraordinary research productivity of our Faculty from May 2013 to April 2014. It was an outstanding year: Faculty members were awarded 32 grants, garnering nearly three million dollars of research funding. This significant growth in our research income is due in large part to successful applications to the Canada Foundation of Innovation (CFI) granting program. Faculty members also published 185 peer-reviewed papers, three books, 36 book chapters, 11 abstracts and made nearly 200 conference contributions – representing a tremendous amount of new knowledge. And, our research capacity was strengthened considerably with the addition of four new faculty members.

In the following pages, you will meet our faculty and read about their many research accomplishments. I have no doubt that our talented researchers and scientists make this faculty one of the best in the world. We hope you enjoy the report.

Here's to many more successful years!

Ira Jacobs, Dean

Faculty of Kinesiology and Physical Education



Fig. 1 Research Funding by Year (Apr-Mar) Awarded

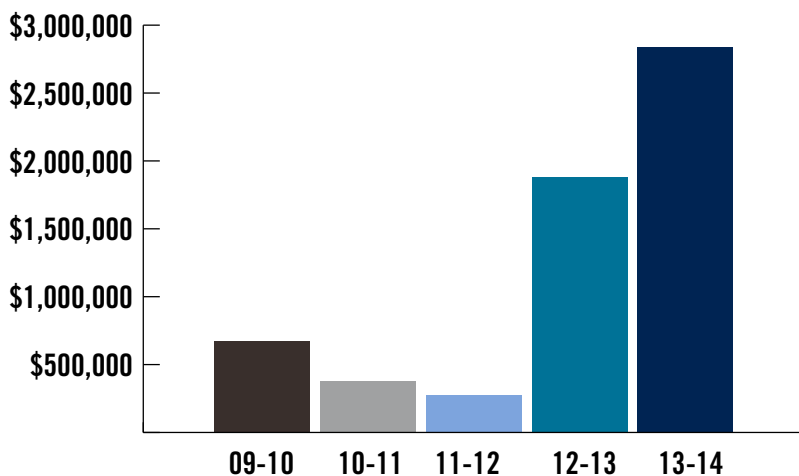
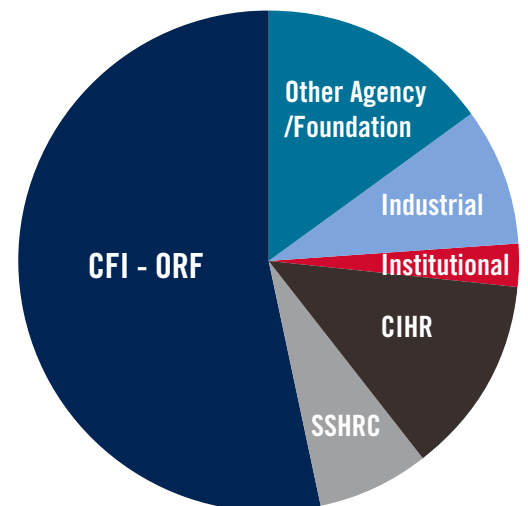


Fig. 2 2013-2014 Research Funding By Sponsor Type



MEET THE RESEARCH FACULTY



Prof. Kelly Arbour-Nicitopoulos
Health and Exercise Psychology Unit
 Psychosocial predictors of physical activity - interventions in populations with chronic disability
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Prof. Michael Atkinson
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Prof. Tyson Beach
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 Biomechanics & ergonomics of work, sport and exercise - qualitative & quantitative analysis of human movement
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Prof. Simon Darnell
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 Sociology of sport & physical activity - sport for development & peace - sport & public policy
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Prof. Peter Donnelly
Centre for Sport Policy Studies
 Sport subcultures - sport and social inequality - sport and space - sociology of risk taking
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Prof. Guy Faulkner
Health and Exercise Psychology Unit
 Physical activity (PA) promotion in the community & rehabilitation - PA and psychological well-being in children & adults
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Prof. David Frost
Biomechanics and Injury Prevention Laboratory
 Musculoskeletal health & injury prevention - movement screening and evaluation - strength & conditioning
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Prof. Caroline Fusco
Centre for Sport Policy Studies
 Sociology of physical activity & health - cultural geographies of child and youth physical activity/sport environments
 c.fusco@utoronto.ca



Prof. Jack Goodman
Exercise and Cardiac Health Lab
 Cardiac & hemodynamic response to prolonged exercise - cardiac rehabilitation - exercise and heart failure
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Prof. Michael Hutchison
Concussion Program
 Sport concussion & brain injury - rehabilitation - injury prevention - neuropsychology - epidemiology
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Prof. Ira Jacobs
Human Physiology Research Unit
 Exercise physiology - adaptations to acute short-term, high-intensity exercise - exercise pharmacology
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Prof. Gretchen Kerr
Sport and Performance Psychology Laboratory
 Harassment & abuse in youth sport - athlete-centred coaching practices - the retirement transition from sport
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Prof. Bruce Kidd
Centre for Sport Policy Studies
 History & political economy of Canadian sport and physical activity - Olympic, Paralympic and Commonwealth Games
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Prof. Marius Locke
Muscle Physiology Laboratory
 Cellular response to muscle damage - heat shock proteins and their ability to protect skeletal muscle from damage
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Prof. Margaret MacNeill
Media and Motion Lab
 Health communication - health & physical literacy - visual media methodologies - critical policy studies of public health
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Prof. Lynda Mainwaring
Concussion Program
 Emotional recovery from concussion, psychological recovery from dance & athletic injuries - sport psychology
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Prof. Dan Moore
lovate / Muscletech Metabolism and Sports Science Laboratory
 Muscle protein metabolism - sports nutrition - training adaptations - musculoskeletal health with exercise & disuse
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Prof. Doug Richards
Concussion Program
 Concussions in sport, clinical sport medicine, biomechanics of injury - health & lifestyle - injury prevention
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Prof. Catherine Sabiston
Health and Exercise Psychology Unit
 Psychosocial determinants of health behaviour - body-related emotions - physical activity & cancer - mental health
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Prof. Katherine Tamminen
Sport and Performance Psychology Laboratory
 Sport psychology - stress, coping & emotion - youth sport & adolescent athletes
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Prof. Scott Thomas
Health and Performance Lab
 Increasing access to cardiovascular health - exercise and aging - exercise and performance - fitness testing
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Prof. Luc Tremblay
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 Multisensory integration: vision, proprioception, audition - neuromotor control of voluntary action
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Prof. Greg Wells
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PUBLICATION SUMMARY	2013/2014
Peer Reviewed Journal Publications	185
Books – written	3
Books –edited	-
Book Chapters	36
Conference Abstracts	11
Conference Presentations	194
Non Peer-Reviewed Publications	31

2013-14 NEW MINDS



PHOTO/ (LEFT) PROVIDED BY KATHERINE TAMMINEN (RIGHT) ANDREW VOWLES

Recruits bring expertise in nutrition, exercise behaviour

This July the Faculty will expand its exercise behaviour team and welcome an expert in nutrition, with the recruitment of new assistant professors Katherine Tamminen and Daniel Moore.

Moore brings valuable experience from both the lab and the field. From 2009 to 2011, he worked as a research and development specialist at the Nestlé Research Centre in Lausanne, Switzerland – an organization he continues to work for as a scientific consultant. He is currently a post-doctoral fellow in the department of health and nutritional sciences at the University of Guelph, where his research focuses on how exercise and nutrition impact the body in a breadth of population groups.

Tamminen, currently a postdoctoral research fellow at the University of British Columbia, completed her PhD with a focus on stress management in adolescent athletes. Most recently, the already well-published researcher worked as co-investigator for a Social Sciences and Humanities Research Council-funded project investigating children’s physical activity and play.

“Drs. Moore and Tamminen will be important additions to our faculty complement,” says Dean Ira Jacobs. “Each will inspire our students and enable exciting collaborative and networking opportunities within and outside of our Faculty.”

Originally Published in *Pursuit* Spring 2013 by Valerie Iancovich

Changing the world through sport



Dr. Simon Darnell brings his expertise in international development and sport to the Faculty in July.

This summer, the Faculty of Kinesiology and Physical Education welcomes Dr. Simon Darnell, Assistant Professor, specializing in sport for development.

With an undergraduate and master's degree from the School of Human Kinetics at UBC, Darnell went on to earn his PhD at U of T in 2008. He was subsequently awarded a Social Sciences and Humanities Research Council of Canada (SSHRC) post-doctoral research fellowship in the Department of International Development Studies at Dalhousie University, where he was also an instructor.

Darnell is currently finishing his third year as a lecturer in the Sport, Exercise and Physical Activity Programme at Durham University in the United Kingdom, and is looking forward to returning to our campus.

“Moving back to Toronto is a bit of a homecoming for me,” said Darnell. “This is an exciting opportunity – it’s rare to see such an institutional commitment to this type of research. U of T has become a hub for studies on the relationship between sport and international development, and there is very important work being done here. I’m excited to be a part of that.”

Balancing a unique blend of global citizenship and physical culture, Darnell’s research includes topics such as the effects of major sporting events on communities, athletes as political activists and sport for development and peace.

Darnell will begin teaching in January of next year with an undergraduate course for students interested in his areas of study.

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Faculty complement grows again



In addition to the recent announcement of Professors Katherine Tamminen and Dan Moore, featured in the spring issue of *Pursuit*, Dr. David Frost joins the Faculty as assistant professor for a three-year term.

His research interests focus on the capacity of individuals’ musculoskeletal systems to withstand the physical demands of their work, sport and activities of daily living. Frost shares research interests and lab space with Professor Tyson Beach. Working with other faculty members and instructors, he will also plan and coordinate the core first-year and second-year practica courses, while teaching the third-year practica and an upper-year kinesiology course.

Frost received his PhD in biomechanics from the University of Waterloo in January 2013. His MSc is in sports biomechanics from Edith Cowan University in Australia. He has three undergraduate degrees from Queen’s University: a BSc in electrical engineering, a BA in health studies, and a BPHE. An experienced practising kinesiologist, Frost has been actively engaged as the director of education for the Ontario Kinesiology Association as well as in consultations with the Transitional Council of the College of Kinesiologists of Ontario.

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HEALING POWER

ACTIVITY AS ANTI-DEPRESSANT

BY ELAINE SMITH

ILLUSTRATION BY LUKE PAUW



Mark Duncan first took an interest in psychology and neuroses in high school, intrigued by how the brain sends messages to the body. However it wasn't until his undergraduate days at the University of Toronto, after he injured his back while skiing, that he realized how closely exercise was linked to mental health.

"Skiing was my outlet for activity," said Duncan, now a master's degree student in exercise science. "I belonged to the U of T Ski and Snow Club, and I would hop on the bus on weekends to go up to Blue Mountain to get away."

A back injury during a ski vacation made for an uncomfortable journey home. The following day, Duncan was unable to get out of bed. Eventually, he saw a physiotherapist and began an exercise regimen.

"Prior to starting an exercise program, I felt down and not able to focus," said Duncan. "I don't think I would have met the diagnosis criteria for clinical depression, but I certainly felt sadness."

Duncan isn't the only university student who has struggled with stress or depression. They are both issues that have received increased attention on Canadian university campuses in the past few years. Students feel the pressure to perform and a large number are far from the friends and family who are usually there to offer them support.



Statistics from the Canadian Mental Health Association (CMHA) help tell the tale. Approximately five per cent of male youth and 12 per cent of female youth, ages 12 to 19, have experienced a major depressive episode, while it is estimated that 10 to 20 per cent of Canadian youth are affected by a mental illness or disorder – the single most disabling group of disorders worldwide. Suicide is among the leading causes of death in 15 to 24-year old Canadians, second only to accidents.

Unfortunately, there are often long wait times for mental health treatments. The University of Toronto has a Counselling and Psychological Services office for its students, but it, too, can be overwhelmed by demand.

Luckily, progress is being made – particularly by Professors Guy Faulkner, Catherine Sabiston and Kelly Arbour-Nicitopoulos from the Faculty of Kinesiology & Physical Education. This unique group of professors is in the process of establishing the Mental Health and Physical Activity Centre (MPARC) at U of T. Thanks largely in part to a \$500,000 grant from the Canadian Foundation for Innovation (CFI), MPARC will take shape as a new research centre that will allow these faculty members to study the effects of exercise on mental health in various population groups.

“One in five Canadian adults will experience a mental illness

during a one-year period, and rates are at least triple among clinical populations such as individuals diagnosed with a chronic disease,” Faulkner wrote in the CFI proposal. “One of the most effective non-pharmacological interventions for mental illness is engagement in physical activity.”

In what he calls a “defining first project of the facility,” Faulkner hopes to create and implement strategies that can be used by U of T students to increase a sense of wellbeing. He will be reaching out to the university’s Counselling and Psychological Services office, offering valuable research to aid their work in reducing student stress and depression.

With the development of a university-wide mental health strategy underway, U of T students like Duncan are encouraged to exercise at the athletic facilities on all three campuses as one outlet for stress reduction. The university has also implemented MoveU, a tri-campus physical activity engagement strategy that combines messaging about the benefits of activity with a peer-to-peer network and programs to encourage students to try a range of activities and movement options. For example, MoveU offers 15-20 minute Brain Breaks at the library during exam periods and five-minute MoveU Moments in classroom settings, as well as regular skating nights at Varsity Arena.

Thanks to a \$500,000 grant

from the Canadian Foundation for Innovation, the Faculty of Kinesiology and Physical Education will boast a new research centre where faculty members will study the effects of exercise on mental health.

“We look at ways to create opportunities for students to be happy, healthy and well,” said Michelle Brownrigg, Director of Physical Activity and Equity at the Faculty of Kinesiology and Physical Education. “MoveU’s essence is to use physical activity as a means of positive mental health, academic success, community building and forging links to creativity.”

As successful as these options may be, they are not formal programs to stave off depression, and that’s where Faulkner hopes MPARC’s research can assist.

“One focus for me is depression,” Faulkner said. “One of the distressing aspects of mental health care is wait time. Given the evidence that exercise can be an anti-depressant, can we get students to come in and exercise and look at what type of short-term benefits they see?”

“Here is a facility where we can provide safe care. It’s a very exciting project I’d like to pursue.”

Working with the university’s counselling service, Faulkner said it would be necessary to establish a referral process to see if students like Duncan would come, given the lessening of energy and motivation that accompanies depression.

“Physical activity is a win-win,” said Faulkner. “It’s a cycle. People are more likely to be physically active when they have good mental health, and they’re more likely to have good mental health when they’re more physically active.”

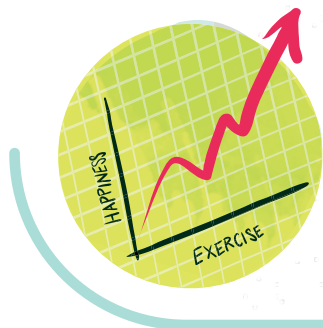
“It just makes sense to help out, because part of the work universities do is to ensure adequate care and support for students.”

Other at-risk groups will also reap benefits when the centre is up and running.

“Our focus is on developing interventions to promote physical activity,” said Faulkner, “with the main outcome being mental health.”

For a number of years, Faulkner has been involved in exercise research among people with schizophrenia; he is currently part of a research program funded by the Canadian Institutes for Health Research. People with schizophrenia are very susceptible to heart disease, are generally less active than the general population and tend to die 25 years younger.





“Physical activity is a win-win,”

said Faulkner. “It’s a cycle. People are more likely to be physically active when they have good mental health, and they’re more likely to have good mental health when they’re more physically active.”

“I’ve explored how to develop interventions for that population, while addressing a whole host of their cognitive and motivational challenges,” he said. “There have been mobile apps and web-based techniques developed to help them, but now we will have the facilities to develop more structured programs.”

The creation of MPARC also offers another enormous benefit, both to the researchers and the university. It will enable Faulkner and his colleagues to broaden the scope of their research, working on much larger projects. He expects invitations from partners both locally and globally to participate in multi-site trials, and there will be opportunities for him and his colleagues to initiate large-scale studies of their own. Previously, KPE didn’t have the requisite capacity.

“A fabulous exercise treatment facility is what attracts people, so we wouldn’t be able to do this without CFI involvement,” Faulkner said.

Faulkner noted that multi-site trials are becoming much more common in exercise psychology because they offer the opportunity to study large groups of subjects. With MPARC in the works, he and Sabiston were recently able to apply to become a research site for a large study that will evaluate men going through prostate cancer treatment, looking at sedentary behaviour and exercise.

“It would be very exciting to be involved at the cutting edge of a large intervention that is going on globally,” said Faulkner.

The facility’s seven suites will comprise two cardiovascular and strength-training suites, as well as suites for baseline and primary end point cardio-respiratory and muscular fitness data collection; biochemical indices; counselling, interviews and focus groups; psychological indices and web-based applications; and data analysis.

“People have wondered why a facility like this doesn’t exist in Toronto,” Sabiston said. “We put together a dream list of equipment, and now we’ll have a testing suite that will allow us to do the types of tests that have been missing from our research studies.

“It’s important to have the same equipment that other labs have so we can compare results. With this infrastructure, large studies will come our way.”

Arbour-Nicitopoulos believes the new centre will also be a draw for students interested in research.

“There will be volunteer opportunities for undergraduates, and they will get to do placements, too,” she said.

“The skill set they will develop during directed research projects will be just incredible.

“As for graduate students, they’ll really be able to do some interesting studies and make contributions to their areas of study,” she said. “I’m excited that the students will be exposed to different types of studies and techniques. It will make them even more marketable and let them see all the opportunities that are out there for them nationally and internationally.”

Duncan, the master’s degree student, is early proof of the centre’s powers of attraction. His thesis research focuses on schizophrenia and exercise, and the MPARC is one of major factors in his decision to remain at U of T to pursue his PhD.

“It’s a dream come true for me as a trainee,” Duncan said. “I’m coming into something I’m already excited about and to know I’ll have access to the range of equipment in the new facility is fabulous.”

Faulkner noted that the equipment may be more sophisticated and the studies larger in scope, but the focus will continue to be on developing interventions to promote physical activity.

“At the end of the day, we’re still fixated with the challenge of how to get people moving,” he said.

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STRESSED STUDIES:

The American College Health Association surveyed a sample of 32 Canadian universities, looking at mental and physical health among students at both large and small institutions. Their findings, based on about 34,000 respondents, indicate that within the 12 months preceding the survey;

89.3% of students felt overwhelmed by all they had to do

53.8% felt things were hopeless

56.5% felt overwhelming anxiety

86.9% felt physically exhausted, but not due to activity

Matching survivors with ideal workout partners



Inspired by the idea of online dating, associate professor Catherine Sabiston is hoping to help cancer patients find their perfect exercise “match” post-treatment.

“One of the biggest barriers that women with cancer identify is lack of social support,” said Sabiston. “They say that if they just had someone to knock on their door and pull them out of the house, they’d exercise. It made me wonder how to match these women with other women so that they can get that social support and hopefully exercise more.”

Sabiston met with computer engineers who had developed a popular online dating service and discovered that she

could create a similar forum where cancer survivors can specify criteria and find an ideal workout partner. Tentatively called Connecting Peers in Motion, or CPM, the website idea received an innovation grant worth over \$191,000 from the Canadian Cancer Society.

Features of the website will be tailored to accommodate partnered exercise and include resources like a partner-matching tool, discussion forum and examples of exercises made for pairs.

“The social dimension of exercise has more of an impact than the physical dimension in terms of improving quality of life,” said Sabiston. “A quality match can not only impact one’s fitness

level, but also improve their life from a social and emotional point of view.” The study will look at women of various ages and with different types of cancer. Sabiston’s team will follow 50 pairs over a year, charting their progress to determine what effect social support has on physical activity.

Sabiston’s first step will be to create a website design based on feedback from focus groups. Once she has determined what participants would like to see in an online matching system, the CPM website will be built, tested and ready to launch later this spring.

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Stress relief

improving the youth sport experience

Professor Katherine Tamminen's goal is clear: help all children enjoy their sport experiences. Now, with the help of two new funding grants, she's well on her way.

Inspiration for Tamminen came a few years ago while she was working as a sports psychology consultant at a hockey academy. While hosting a session for the young athletes, discussing what made them feel happy and what caused them stress, one boy's response made her take pause.

He had written: one of the things that is the most stressful for me is the car ride home.

"It really struck a chord with me. He just wanted to play hockey and that car ride home after the game was such a negative experience. It wasn't the sport that was hard for him – it was dealing with the repercussions," says Tamminen. "I really want to make that situation better."

Thanks to funding from both the U of T Connaught Fund and the Social Sciences and Humanities Research Council (SSHRC), Tamminen now has two major projects on the go that will help children improve their sports experiences.

The Connaught-funded project focuses on a two-pronged, parent-and-child intervention to help young athletes better cope with stress. Separate focus groups will initially be held for parents and young athletes so that they can voice their feelings, both positive and negative. From there, Tamminen and her team will develop and test interventions based on the feedback from these interviews to help improve the sport experience.

"Some of the past research that's been published on parents in sport suggests that parents don't know what to say in those moments, or don't know what's going to be interpreted well – or not so well – by their child," says Tamminen. "So parents require assistance to improve the efficacy of those interventions."



Which is where her research comes in. A critical part of these focus groups is finding out what works well for families and using this information to create what could be called a best-practices toolbox to help parents and children communicate more effectively with one another.

"It's not just about saying 'parents you need to do this better' or 'athletes you need to do this better,'" says Tamminen. "It's about working together and improving that relationship."

Once those best practices have been identified, Tamminen's next step will be to host interventions with parents and young athletes to help them enrich the sports experience through effective communication.

In a complementary study funded by SSHRC, Tamminen is working with Respect Group, Inc. to study the Respect in Sport Parent Program, a project that promotes positive relationships in youth sport, with an aim to reduce bullying and aggression.

While the Respect in Sport Parent Program is currently being implemented within the Ontario Minor Hockey Association (OMHA), with mandatory participation from the parents of these athletes, Tamminen's research will involve a broader audience with online surveys open to parents and young athletes from any sport. In-person interviews and a review of the policies and procedures of youth sport organizations will also take place, thanks to co-investigators Gretchen Kerr and Peter Donnelly.

And while both projects are a lot to tackle, Tamminen knows that it's all for a good cause.

"We do get a lot of people who are doing things well and we want to learn from that and communicate it to others. Parents generally want what's best for their child. Sometimes they just aren't aware of how their messages are coming across."

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CONCUSSION: PRIORITY ISSUE IN THE LAB, ON THE ICE



Don Fehr, executive director of the NHL Players' Association, delivers a keynote address at Mind Matters: From concussion to recovery. Photo: Jing-Ling Kao-Beserve

On May 27, the New York Rangers headed to Quebec for a pivotal game against the Montreal Canadiens during the National Hockey League playoffs. During the third period, Canadiens forward Dale Weise took an illegal hit to the head from a Rangers defenseman. His helmet came off upon impact and Weise tumbled to the ice. Although he claimed to feel fine, Weise appeared woozy after the fall. Video footage showed Weise being led off of the ice by a teammate. He was later diagnosed with a concussion.

Injuries like the one Weise sustained made the Faculty of Kinesiology and Physical Education's seventh public research symposium, Mind Matters:

From concussion to recovery, that much timelier. Hosted on May 27, the discussion brought a panel of experts to U of T's Isabel Bader Theatre, to discuss the physiology, treatment, psychological effects and professional policy surrounding concussions.

Over 350 guests attended the public event, with audience members ranging from athletes and coaches, to researchers and concerned parents. Hosted by Dan Berlin of TSN radio's Inside the Lines, the discussion served as a platform for U of T researchers to present the latest findings on traumatic brain injury and recovery.

Dr. Doug Richards, assistant professor and medical director of U of T's David L. MacIntosh Sport Medicine Clinic, delivered the first talk of the evening. He focused on the physiology of concussion, defined the injury, and explained that no two concussions are alike.

"The term concussion is an umbrella that covers multiple slightly different injuries," Richards said. "And different injuries beg for different treatments."

Dr. Michael Hutchison, research associate in U of T's concussion lab, discussed the use of exercise as an important part of concussion treatment. While traditional treatment involves resting and abstaining from physical activity until concussion symptoms completely subside, Hutchison's research shows that intervening with

"We need to be more specific in both our diagnosis and treatment of concussion, but we're a long way away from that," — Dr. Doug Richards

structured exercise earlier in the recovery process may actually improve outcome, or at the very least, not cause harm during the recovery phase.

KPE faculty member and clinical neuropsychologist, Dr. Paul Comper, further discussed options for concussion treatment and how the complexities of this type of brain injury make it difficult to take a uniform, "one size fits all" approach to treatment and recovery.

Associate professor Lynda Mainwaring outlined the emotional consequences of concussion. During the acute phase of injury, concussed athletes experience a depressed mood, decreased vigor and sleep quality; confusion, and symptoms of anger and fatigue. Mainwaring stressed that caregivers should keep these emotional changes in mind when determining a course of treatment for concussed athletes.

Don Fehr, executive director of the NHL Players' Association, delivered a keynote address about the importance of awareness and education as key tools for professional athletes with which to arm. He shared that the NHL Players' Association facilitates workshops between players and health-care professionals that outline the signs, symptoms, and treatment options for concussion.

"When dealing with concussion, you must factor in science, medicine and politics with regards to decision-making," said Fehr. "My job is to make the players aware of everything they need to know in order to make the best decisions for their health."

Several questions were posed to the panel from the packed house at Isabel Bader Theatre, and the general theme of the evening pointed toward individualizing treatment for concussion sufferers and changing sport culture so that managing injury is a top priority for players and caregivers alike. A great message for concussed athletes like Weise, who, despite early symptoms of injury, returned to play just minutes after the jarring blow to his head.

Experts on the panel agreed that embedding concussion awareness in sport culture is the key to preventing and managing injury.

"We need to be more specific in both our diagnosis and treatment of concussion, but we're a long way away from that," said Richards. "So, we need to stop hitting our heads. The 'cure' for concussions is not in sight, so we need to take steps to prevent them."

Published 04/06/2014 by Adrienne Harry



CONCUSSIONS CAN SPELL OLYMPIC DISASTER

British teenager Rowan Cheshire's hopes of competing in the 2014 Sochi Games were dashed on Sunday, when the 18-year-old halfpipe skier fell on her face during training. Cheshire, whose fall came just four days before her scheduled event, was withdrawn from the Sochi Games by Team Great Britain's medical staff.

"A concussion is an injury that can occur when the brain is subject to trauma if a person stops quickly or is struck by something," said Michael Hutchison, PhD, a research associate at the Faculty of Kinesiology and Physical Education who specializes in concussion research. "Rapid acceleration or deceleration results in significant movement and parts of the brain may compress or stretch, altering communications channels between or within the brain's neurons."

Each individual concussion is different, affecting the subject in physical, cognitive, sensory or emotional ways, causing symptoms such as headache, memory problems, sensitivity to bright lights or loud noises, and sadness or irritability, Hutchison explained, something that can be confusing to both the sufferer and to onlookers. Symptoms may be present for only two days or for months.

The good news: healing and recovery are possible. The bad news: healing and recovery take time. At an Olympic Games, time is often at a premium for athletes who have a day or two to perform at their peaks.

"Recovery is a process," said Hutchison. "Athletes need to reach benchmarks before they can receive medical clearance."

First, athletes must not demonstrate any symptoms when they are at rest. Next, they must show that they don't have symptoms during the phases of an increasingly demanding exercise protocol. Finally, they attempt to undertake sport-specific exercises without symptoms.

"If their symptoms resolve quickly, they may work through the stages more quickly," said Hutchison.

Unfortunately for an Olympian, it may not be quickly enough to compete.

"If a concussion is reported or identified, the chances of continuing to participate are definitely in question," said Hutchison. "It's not so different from any other sports injury. If you tear your medial-collateral ligament (MCL) or separate your shoulder, you likely won't be able to continue on the same day."

If an athlete doesn't report the injury and competes anyway, Hutchison says he or she runs the risk of sustaining another injury (brain or otherwise) as well as making the symptoms worse and being away from the sport for a longer period of time.

"From a performance standpoint, if you alter your brain through injury, you won't be able to process information or make

decisions as fast and you won't perform well," he said. "The idea that you are doing a good service by staying in the game and being a warrior has enormous consequences."

Hutchison says any high-performance athlete could sustain a concussion, but some sports offer more risk than others: hockey, with its deliberate body contact; alpine skiing, with its high-speed acceleration and deceleration; other alpine sports where there is a risk of falling; and speed skating, due to the speeds achieved and the falls skaters take.

Although the recovery timeline is too tight for Cheshire to compete in Sochi, she already has her sights set on the 2018 Games in PyeongChang, South Korea.

"I am hugely disappointed I won't be able to compete on Thursday," Cheshire said in a statement to British newspaper The Telegraph. "I am determined to be back in four years' time competing for an Olympic medal."

Published 18/02/2014 Elaine Smith

A PASSION FOR PLAY

Paloma Holmes is living out many a child's fantasy: she has run away to join the circus.

Holmes, a third-year PhD student in exercise science at the Faculty of Kinesiology and Physical Education, is spending a year as the researcher-in-residence for the National Circus School in Montreal where she is exploring the convergence of arts and athletics. She is hoping that an understanding of the circus pedagogy will shed new light on the important roles of emotion, playfulness and body language to physical activity.

"There has been little research done on the more theatrical and artistic ways of getting people to move" said Holmes, who is supervised by Professor Michael Atkinson. "I'm looking at more collaborative spaces, as opposed to competitive ones. I think that what sustains people is using their bodies in ways that are playful, fun and creative, rather than focusing on attaining a certain number and reducing the body to quantitative measurements."

The National Circus School is located in Montreal North, in between the international headquarters of Cirque du Soleil and a performance space run by TOHU, a non-profit organization dedicated to disseminating circus arts. As researcher-in-residence, Holmes will take an in-depth look at a core group of students from each of the three years of the school's program, as well as their instructors. She will investigate how students learn to use their bodies as communicative tools and how collaboration, rather than competition, helps them excel.

"I like the idea of looking at body language as a way of engaging others," she said. "It may aid in improving our understanding of interpersonal communication and in becoming more attuned to the diversity of learning styles and abilities."

Holmes, who has a master's degree in sociology, is also interested in the multicultural nature of the circus.

"Circus is inherently multilingual," she said. "It isn't subject to the same standardization as sport. At its core, circus celebrates diversity, which I think is valuable for thinking about our larger political landscape.

"It has a lot to tell us about communication between different cultures."

Another aspect of the circus Holmes finds very attractive is the way it embraces playfulness. She noted that the importance of play for children has been studied and acknowledged, but as youngsters reach adolescence, play is devalued.

"Adolescents are expected to develop an interest in sports and then there is an infantilizing of play," she said. "The circus is unique. It recognizes play as integral to learning across the lifespan.



Paloma Holmes finding her playful side at the Toronto Circus School.

If play is crucial to a child's development and helps with critical and reflective thinking, why stop? We have much to learn about sustaining and pursuing these elements."

"If play is crucial to a child's development and helps with critical and reflective thinking, why stop? We have much to learn about sustaining and pursuing these elements."

The fear of failure Holmes has seen in gym classes isn't something prevalent in circus training, she said. There are no teams, no winning and losing, no "us" versus "them."

"They approach physical obstacles in a more creative light," she noted. "Setbacks become something to overcome playfully and a stepping stone for learning and innovative creation. If they fall, they get back up, laugh and help each other."

"They learn to try something new, to overcome their limits and expand in new ways. The students are energized by challenges and about what the body can do. This transmits to anyone who is watching; it makes you want to move."

Published 26/11/2013 by Elaine Smith



The Sochi dilemma

With the Sochi Olympics just a few months away, many are calling for action against Russia's controversial new law banning "gay propaganda." Olympian, sports historian and human rights activist Professor Bruce Kidd weighs in on the possibility of a boycott and the relationship between human rights and the Olympic movement.

What has been your reaction to recent developments out of Russia concerning LGBTIQ rights?

It's outrageous what the Russians are doing. It's important that the entire sports world puts pressure on the Russian government to repeal this new law, and supports LGBTIQ activists in Russia (and other countries where homophobia is state-sanctioned). For Sochi, we must hold the International Olympic Committee and the Russian Government to their promise that LGBTIQ and pro-LGBTIQ athletes, coaches, officials and spectators will be fully protected. In keeping with Olympic tradition, the IOC must tell Putin that during the course of the Olympic Games, Sochi is an Olympic city governed by the Olympic Charter, which prohibits discrimination of every kind, not a Russian city governed by Russian law.

If Canada and other countries were to boycott the Games, what are the potential outcomes?

A boycott is unlikely and undesirable at this stage. Our first step should be to pursue education and diplomacy. That's what the Olympics are about. They were founded as a way to bring people from different countries and different perspectives together to talk through differences. Also, athletes – despite their powerful, symbolic status – shouldn't be the only ones to carry the ball on difficult human rights issues.

What about other forms of protest?

Rule 50 of the Olympic Charter prohibits political protests and demonstrations, but up until Beijing, it was never used to prohibit self-identification. Aboriginal paddler Alwyn Morris raised his grandfather's eagle feather on the victory podium in 1984; Aboriginal sprinter Cathy Freeman ran her victory lap in Sydney with both Australian and Aboriginal flags; many athletes wear cultural or religious markings such as crucifixes, turbans and hijabs, all without incident. No athlete should be prohibited from wearing a rainbow triangle at the Games. If such action were taken, the athlete should immediately appeal to

the Court of Arbitration for Sport, which is set up at every Games to hear urgent cases, with the full legal support of the international community.

Do you think that any development or circumstance would warrant cancelling these Olympics? What action should the IOC take going forward?

Yes, if Putin were to say that if a pro-gay person comes to Sochi they will be imprisoned, then the IOC must say that we're not having an Olympics in 2014. That's a definite. And in the future, the IOC has got to make its support of human rights much more emphatic. In the past, the Olympic Movement accepted all countries regardless of their human rights records in an effort to bring everyone into the tent. But everyone is now in the tent, and the world expects a higher standard. We've got to make full respect of human rights part of the IOC contract with host cities, and it needs to clearly state that we will never even entertain a bid from a country that does not respect all aspects of human rights.

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Exploring exercise and participation

Master's candidate Patrick Jachyra is exploring why some boys become less active as adolescence approaches. Photo: Jing-Ling Kao.

Although physicians, exercise physiologists and a battalion of healthcare organizations continually point out the importance of regular physical activity for lifelong good health, data show that youth today are less active than they were in the past, says Patrick Jachyra.

It would be easy to blame this drop in activity on the prevalence of video games and other online amusements, but Jachyra, a master's candidate at the Faculty of Kinesiology and Physical Education, is determined to dig deeper. In doing so, he has turned to Sterling Hall, a private Toronto boys' school that has a research partnership with the University of Toronto through its Sterling Institute.

"This is a qualitative case study to understand the dominant practices," said Jachyra, who is supervised by Professor Michael Atkinson. "I want to know if early experiences in life translate into a desire to participate – or not – in exercise later on."

Jachyra says the statistics indicate that boys today are more inactive than girls, especially as adolescence approaches. Thus, Sterling Hall physical education classes provide an ideal venue to study young boys and their involvement with physical activity. The day school has an ethos of participation, says Jachyra, and there is a

strong focus on sports, physical activity, fitness testing and cardio endurance.

He has spent two three-month periods working with the physical education classes there, building trust and assisting, observing and talking with the students. This winter, he plans to spend another three months making additional observations.

"I want to try to influence the teaching community and benefit the teaching practice,

"I spend time with both the high ability and low ability kids," Jachyra says. "I want to understand their experiences to build a more inclusive approach to physical education."

"I'm trying to develop a teaching practice and philosophy that will increase the physical activity levels in general for both groups. If we can understand what drives them to participate, we can change things so they enjoy the experience."

He notes that a hierarchy is quickly apparent in the classes, reflecting those who are skilled at sports and those who are not. Jachyra observes that the athletically

talented students love competition; some of the less gifted athletes do, also, but they have fewer opportunities to win. "One of the most interesting findings is that kids who don't participate much in class told me that they want to keep active," he says. "They are generally involved in alternate sports that haven't migrated into the physical education paradigm: tae kwon do, kung fu or Parkour, for example."

"Can we potentially use other activities to achieve the same (health and activity) outcomes, instead of focusing only on sport? There are other physical activity cultures we can be making use of and we're not. It might help the kids who don't fit in with the dominant group. We can find ways to make exercise rewarding for kids of all abilities."

Jachyra hopes to bring his work to the attention of both the academic community and the teaching community. His goal is to see these ideas applied in the field.

"I want to try to influence the teaching community and benefit the teaching practice," he said. "By providing alternative ideas from evidence-based research findings, I can influence policies and procedures."

Published 09/12/2013 Elaine Smith



Report reveals ongoing gender imbalance in varsity sport

Kristine Drakich is well acquainted with Canadian intercollegiate sport culture. The Varsity Blues volleyball alumna has been at the helm of the team as head coach since 1989. Over the years, she has seen efforts to make varsity sport more equitable for women ebb and flow. When she heard about Professor Peter Donnelly's recent findings that the country has actually taken a marginal step backwards in terms of gender equity over the last two years, she wasn't surprised.

"When I started there was a great deal of attention paid to the lack of female coaches and resources were in place

to change that," Drakich explains. Her first role as a coach was actually part of a Coaching Association of Canada's women in sport leadership program. "It was a three-year mentorship program that had a phased-in salary support program with the goal of having a full-time position at the end. In the late 90's these resources no longer existed and the interest in providing incentives or supporting women in coaching faded."

Donnelly's report was a follow up to his initial 2011 findings that analyzed women's involvement in varsity sport across Canada. Both found similar patterns of under-representation of women in all areas. Athlete participation data were analyzed based not only on the number of opportunities, but on the gender split in the student body. Donnelly and his fellow researchers at the Centre for Sport Policy Studies (CSPS) found that although 56 per cent of post-secondary students are female, male athletes make up 57 per cent of varsity athletes (up one percentage since 2011). From Drakich's perspective, the climate for female athletes has improved over the last decade or so, but the culture remains male-centric. "Women's sport does get more attention than it did when I was competing and some things are more equitable. But women's sport is still valued less than men's at universities and in the sport

"There are fewer female university coaches in Ontario now than when I first started coaching,"

community in general."

Donnelly's research found some progress in leadership equity since 2011 when women made up only 17 per cent of athletic directors. Today, almost one in four university athletic directors are women. Yet, there are now seven fewer women head coaches, with their representation dropping from 19 per cent to 17 per cent. More men are now also coaching women's teams, up two per cent to 68 per cent.

"There are fewer female university coaches in Ontario now than when I first started coaching," Drakich points out.

"When I started at U of T there were about eight female [volleyball] coaches in the Ontario league and in 2013-14 there are four. This has changed the conversations around the table at coaches meetings and also puts a lot of pressure on the women who are there to get involved at many different levels."

Professor Bruce Kidd, a long-time international advocate for equity in sport, was a co-investigator for the CSPS report, along with PhD candidate Mark Norman. "Canadian Universities should be setting the bar in terms of equity, not scrambling to keep up," says Norman. "Women deserve opportunities proportionate to their participation in university – and they also need to be better mentored and prepared to take on leadership roles down the road."

Drakich agrees. "We need to identify female leaders, including student-athletes and encourage them to explore coaching and create opportunities to enter the coaching profession as volunteers or staff through incentives and certification opportunities. We need to provide mentorship to help them grow, develop and succeed as the leaders of tomorrow."

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EXAMINING SOUTH ASIAN WOMEN AND PHYSICAL ACTIVITY



“The participants in the study didn’t identify with physical activity, because there is not a strong female role model in South Asian culture for it...”

In her kinesiology classes at the University of Toronto and at her local gym, Vanisha Bissonauth saw very few other South Asian women and wondered why.

“I wanted to know why girls who look like me and eat like me weren’t being physically active, compared to other demographic groups,” said Bissonauth, who earned her BPEH in 2012 and is now attending teachers’ college at the Ontario Institute for Studies in Education.

“South Asians are one of the fastest growing populations in North America and they have one of the highest rates of diabetes and cardiovascular problems, so the risks of not exercising are there.”

The faculty’s third-year independent research course provided her with a perfect opportunity to explore the attitudes of South Asian women toward physical activity and to discover whether cultural traditions, norms and social capital – the ability to access information and make choices for oneself – had an impact on their participation. Bissonauth recruited Professor Margaret MacNeill as her sponsor and delved into her project.

Her first step was a review of the existing literature about South Asian women and

exercise, followed by in-depth interviews with 10 South Asian women in their late teens and early 20s. She also asked each woman to complete a standard questionnaire that gave her a sense of their activity in an average week.

The results of her study offer a picture of the cultural factors that influence health and an interest in exercise and provide a starting point for anyone interested in effecting change. “It’s an approach that can be applied to all cultures,” said Bissonauth. “Women in general aren’t participating in enough physical activity.”

Her findings offer a snapshot of South Asian women who were brought up in Canada straddling two cultures.

“My first main finding was that women had traditional views regarding food and aesthetics,” said Bissonauth. She noted that the traditional South Asian diet, with its high starch component and the amount of oil used in cooking, could contribute to the cultural propensity toward hypertension and diabetes.

There is also an emphasis on good grooming, but that doesn’t translate to an appetite for fitness, she noted.

WHEN ALL THE WORLD'S A STAGE

“South Asian women are supposed to look nice, glamorous and well kept, with nice physiques,” said Bissonauth, “but the focus is more about appearance than how to maintain their bodies.”

Many of the young women found it challenging to balance tradition and family expectations with the demands of Canadian culture. As first-generation Canadians, they walked a tightrope between the old world and the new. Their families believed that academics were paramount and took precedence over other activities, said Bissonauth, and gender norms dictated that a woman's primary responsibilities were those related to family: food preparation, childcare, etc. Setting aside time for physical activity isn't something that is valued.

“The participants in the study didn't identify with physical activity, because there is not a strong female role model in South Asian culture for it,” she said. “In addition to understanding why South Asian women don't participate, I wanted to look at building a community that normalizes physical activity in the South Asian culture.”

Since she is working toward her teaching certification, Bissonauth expects to have an opportunity to put her findings into practice with her students.

“We need to make exercise more culturally relevant so that people can see themselves taking part,” she said. “It can be very intimidating to try something new, and if you don't feel that you are represented, you aren't going to participate.”

She points to gyms that are now offering Bollywood aerobics classes, incorporating South Asian music and dance moves, as an example.

“We need a more equitable approach to physical education that can accommodate the differences in society,” she said. “You can't offer everyone the same thing.”

“However, physical activity can also help participants build connection with people from all walks of life, providing a positive effect on individual growth, as well as overall well-being.”

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The Olympic Games are more than just an athletic event – they're a corporate event, according to Margaret MacNeill, a professor of sport media and communication studies at the Faculty of Kinesiology and Physical Education.

Therefore, it's not only the rules of competition that apply. Athletes are bound by all kinds of potentially unfamiliar business rules, rules that govern what they can – or cannot – say and to whom they can say it. National Olympic Committees, sport federations and the International Olympic committee all have rules and regulations that affect the athlete's freedom, especially in the communications arena.

The IOC has social media, blogging and Internet guidelines “that encourage accredited athletes to post to social media,” said MacNeill, but notes they also restrict their freedom. Athletes are advised not to take on an actual role of journalist's role and are forbidden from reporting on competition. Instead, they are asked to blog in a “first person, diary-type format.” They are forbidden from using the Olympic symbol on their websites, tweets or posts, and may use still photographs only for non-commercial purposes.

And these are just the rules surrounding casual communication. When it comes to social issues in the host country, such as Russia's homophobic laws, athletes have to be careful about what they say, MacNeill said.

“It can be challenging,” said MacNeill. “When it comes to social issues, such as Russia and homophobia, many athletes won't speak up for fear of not having the opportunity to go to the Games.”

“They have a very small window of opportunity to be high performance athletes. They get socialized into containing their thoughts if they want sponsorship.”

On the flip side, MacNeill said, athletes should neither be silenced if they want to speak out on human rights issues, nor feel bound to be “billboards for human rights.”

“Athletes shouldn't be forced by society or groups to speak out.”

In a 1998 study MacNeill conducted with 1,200 Canadian elite athletes, she discovered that 10.3 per cent were forbidden by coaches from talking to the media; and 25 per cent withheld information in interviews for fear of retribution from coaches or sport federations. As a result, she recommends media training for athletes.

“They should have a long-term media plan with a clear sense of when they'll be available to the media – for example, once they're done competing – and when they're not,” she said. If it is made clear from the start, there will be fewer disruptions.

MacNeill also suggests that athletes plan ahead to deal with political questions, since they will undoubtedly arise.

“Athletes have a right to express themselves, but they have responsibilities, too,” she said. “They need to know the laws in the host country, so they aren't at risk if they speak out.”

Finally, she advises athletes to have a clear game plan for how they will spend their free time, who their companions will be and how they will celebrate.

“Athletes can be incredibly mature in one area and not in others,” she said. “They must be careful of what public situations they put themselves in, because the world will be watching.”

This is part of a series celebrating the Olympics.

Published 07/02/2014 by Elaine Smith

Newly-established centre to build bridges between body and brain



Professor Luc Tremblay studies a subject's brain

Whether we are pulling a pen across the page or running at high speed around a track, our bodies and our brains are in constant communication, and the conversation is extremely complex. Understanding the intricacies of human movement is a vastly multidisciplinary effort that the newly-established Centre for Motor Control (CMC) aims to tackle in new ways.

Recognized by the University of Toronto in October as an official unit hosted within the Faculty of Kinesiology and Physical Education, the CMC brings together researchers from across the university – and ultimately Ontario and beyond – in disciplines ranging from health sciences, biomedical engineering, healthy high performance, computer sciences and robotics.

As a hub for this critical research network, the CMC aims to better integrate basic and applied research and to more efficiently translate that knowledge into methods and tools that can be used for training or treatment.

“By bringing people together around the common theme of motor behaviour, we plan to streamline the inquiry process while creating new ways of tackling our research questions,” says Professor Tim Welsh, who will act as the CMC’s first coordinator.

“By bringing people together around the common theme of motor behaviour, we plan to streamline the inquiry process while creating new ways of tackling our research questions,”

Covering the entire spectrum of human movement – from patient populations to elite athletes – the CMC aims to become an international centre of excellence for the study of voluntary human movement.

“The possible outcomes are incredibly exciting and far-reaching,” says Dean Ira Jacobs. “The results of this research and the collaborations it fosters could transform approaches and applications in areas as diverse as patient rehabilitation, workplace design and athlete training.”

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Experts translate brain-body conversation



Pictured/ Left to Right:
Rosie MacLennan, Luc Tremblay, Tim Welsh

The Faculty hosted its fifth public symposium, “The Heights of Human Performance: The Symbiosis of Brain and Body” on May 8 at Isabel Bader Theatre. A spectrum of motor control theory applications were discussed – from the everyday to the extraordinary.

Olympic gold medalist Rosie MacLennan explained how she learned and successfully executed the trampoline flips and twists that earned her top spot at the London Games. Professor Luc Tremblay explained how visual information influences the way we execute all of our movements, from picking up a cup of coffee to landing a double tuck somersault. Professor Tim Welsh, coordinator of the Centre for Motor Control, was the MC of the evening and explained how the principles addressed by his fellow

speakers are informing the design of new, more sophisticated human-computer interfaces. Dr. Heather Carnahan, of the department of occupational science and occupational therapy, wove the evening’s themes together in the context of the operating room.

The speakers revisited various topics during the discussion panel, moderated by Globe and Mail science reporter Ivan Semeniuk. A video of the full event can be found at uoft.me/KPEsymposia.

The next symposium, which will explore human physiology in extreme conditions, is scheduled for Tuesday, December 3.

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The science of eye contact

A student huddles over her exam in a gymnasium packed with other test takers when suddenly she looks up at the professor and makes eye contact. The professor immediately takes note. Is the student in distress? What does she need? “There’s something very unique about this action, this fast movement and direct gaze,” says Professor Tim Welsh, whose recent research was inspired by this very scenario.

Eye contact, or direct gaze, has been researched extensively, but Welsh and his peers, Anne Bockler (Radboud University) and Robrecht van der Wel (Rutgers University), are the first to examine what happens when someone suddenly changes their gaze to look directly at you, combining the social cue of eye contact with a sudden movement.

Their research, published in the January issue of *Psychological Science*, examined whether this sudden direct gaze is processed in a single special channel or in a pair of individual channels.

What they found is that there are two independent channels working together to enhance our engagement with these sudden looks. Without the movement, the gaze would not be as powerful. And the movement alone would not elicit the same response.

The research team drew these conclusions by measuring subjects’

reaction times and attention to detail when looking at a screen with four faces. Participants were seated in front of a screen and a keyboard. The screen displayed four pictures of a human face; two of them were looking at the subjects and two of them were looking away. Each face had a number on the forehead, which intermittently changed to a letter. The subjects had to indicate as fast as possible which letter they saw by pressing a response key. The time between the change of the display and the subject’s

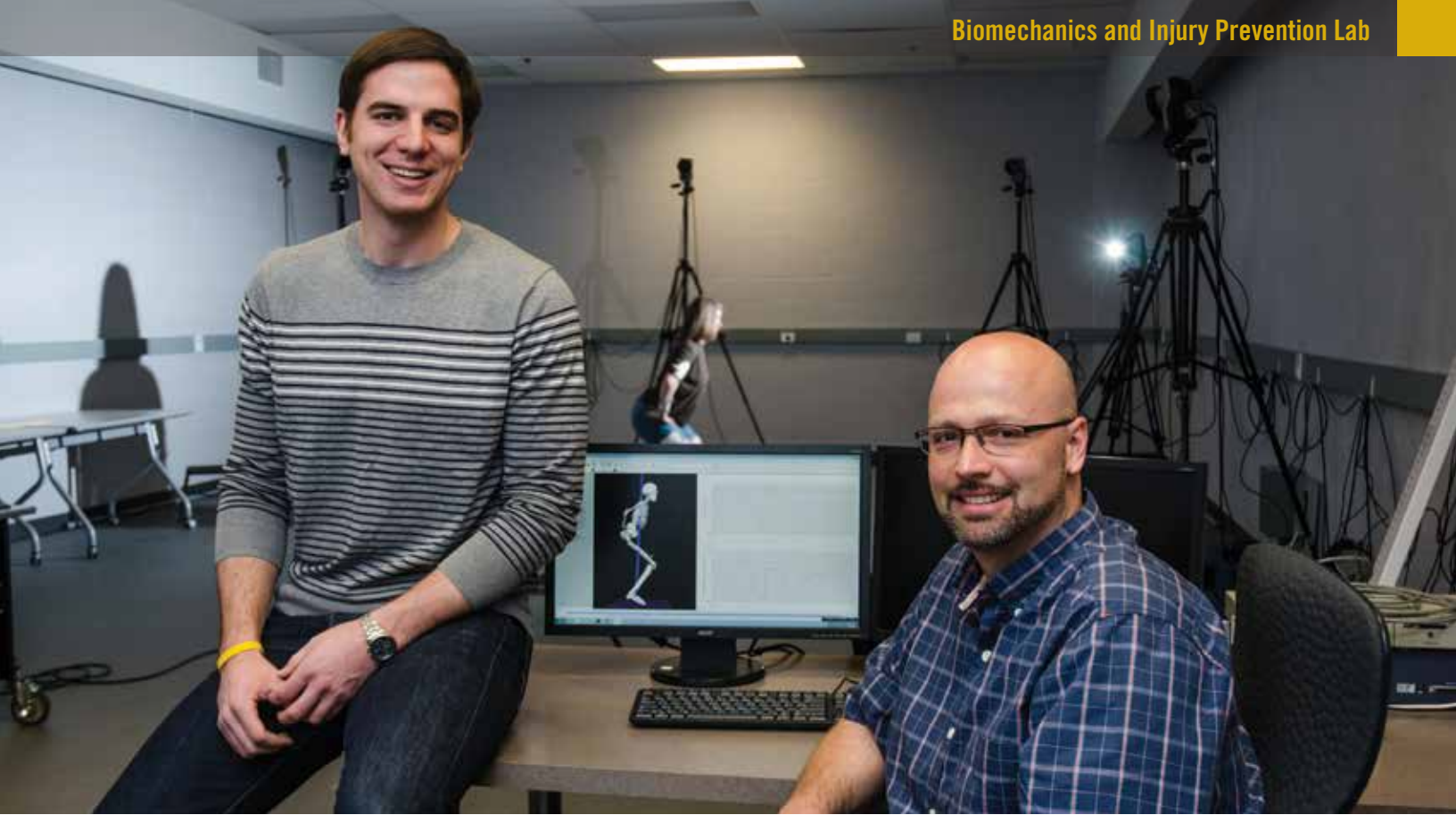
response served as an indication of how strongly attention was captured by a given face: the shorter the reaction time, the stronger the attention capture.

The researchers found that reaction times were shorter when the letter was on the forehead of a face that suddenly gazed directly at the participants, affirming what many of us experience every day—direct eye contact is a powerful thing. Moreover, moving faces capture attention more strongly than static faces. When the eye contact and motion are combined, the result is even more profound.

“So, in the case of the exam-taking students, cheaters really shouldn’t look up right before they engage in suspect behaviour,” Welsh explains. “Whether they know it or not, they’re asking us to pay extra attention to them.”

Published 03/02/2014 by Valerie Iancovich

DIRECT EYE CONTACT IS A POWERFUL THING



Injury prevention new moves to protect knees

As a former Varsity Blues basketball player, Drazen Glisic has experienced his share of knee injuries. Perhaps that's why, as a master's degree candidate at the Faculty of Kinesiology and Physical Education, he is so eager to home in on the causes of one common knee problem, patellar tendonopathy.

Patellar tendonopathy, also called jumper's knee, refers to pain in the anterior portion of the knee. It's a complaint that is very common among athletes in sports that involve a lot of jumping and running, such as basketball and volleyball. If it progresses untreated, it can lead to time away from the sport or to retirement, said Glisic, depending on the age of the athlete involved.

"It's a very common injury among university athletes, and a lot of athletes at the pro level have it as well," he said.

Glisic plans to examine the way athletes jump and how it is related to the demands put on the patellar tendon. He's hoping to identify a particular movement pattern that places a higher demand on the tendon, so that he and others can help athletes to

learn to move in a way that won't stress their connective tissue. Working with his supervisor, Professor Tyson Beach, who is a specialist in biomechanics, Glisic will place reflective markers on the bodies of his subjects and ask them to jump from a platform to a force plate. The data he collects will allow him to calculate the patellar tendon stress for each person.

The reflective markers will react to infrared cameras, providing data that allow each person's stance to be modelled in three dimensions on a computer. Glisic will be able to examine the angles and velocity of each person's motion at various key body points: trunk, hip, knee and ankle.

"I want to see if there is anything in the way they move that predicts the loads placed on the tendon," Glisic said.

He will be recruiting basketball and volleyball players – male and female – as subjects once their seasons end. He also wants to see if there is a difference between the loads men place on the tendon compared to women and whether it can be attributed to a difference in the way each one moves.

Drazen Glisic (left) and Professor Beach study "jumper's knee" and how to prevent injury.

"I am really enjoying the research process," said Glisic. "I am continuously learning. Being with Tyson [Beach] and being exposed to his expertise, I've learned about training, movement, injury prevention and performance. It has opened my eyes to another aspect of exercise science."

Glisic hopes to graduate in November and obtain the necessary certifications to work as a trainer.

"My goal is to get more experience putting research into action in a practical setting," he said.

His master's degree work has made him aware of the importance of research and how vital it will be to stay informed about the latest findings and techniques once he is working with athletes.

"In our lab, we make sure there's a practical aspect behind everything we do," he said. "It has shown me how important it is to make our research matter to others."

**Originally Published in *Pursuit* Spring 2014
by Elaine Smith**

Grad research gets to the heart of women's health



Emma O'Donnell's research explores connections between diet and heart health in women. Photo: Jing-Ling Kao.

Canadians are becoming more aware of the negative effects of too little exercise, but what about too few calories? PhD student Emma O'Donnell's research shows that caloric intake may have a broad impact on cardiovascular health in women.

"In terms of cardiovascular function, women are just different from men," says O'Donnell, who is supervised by Professor Jack Goodman. "Estrogen deficiency, which is typically prevalent in older, post-menopausal women, is associated with increased cardiovascular disease. My question is: if we believe estrogen deficiency to be a risk factor for cardiovascular disease in older women, what about younger women who are also estrogen deficient?"

It is a good question that has not yet been explored. In fact, O'Donnell's study is the first to look at estrogen deficiency and cardiovascular health in physically active women aged 18 to 35. Previous studies have only looked at two extreme ends of the continuum: older, post-menopausal women and younger, anorexic women whose disordered eating brought on amenorrhea (an abnormal absence of

menstruation). In both cases, estrogen deficiency is caused by the absence of menstrual periods. However, O'Donnell wanted to look at estrogen deficient women who fall outside of these two very specific groups.

"The women participating in my research are described as having exercise-associated amenorrhea," says O'Donnell. "They engage in recreational physical activity on a regular basis. They are not described as having eating disorders, but most times, unintentionally, are just not consuming sufficient calories." According to O'Donnell, the calorie deficit they exhibit is minimal. In fact, eating as little as 200 to 250 more calories per day—equivalent to an ounce of almonds and a serving of yogurt—could be enough to reverse exercise-associated amenorrhea in the group she studied. But many women simply do not make the connection between diet and amenorrhea.

O'Donnell's research findings suggest that even a small, but consistent calorie deficit could have surprising implications for cardiovascular health.

"We found that the heart and blood vessel function of our group mimicked that of an anorexia nervosa group," says O'Donnell. "We saw low blood pressure, a lower resting heart rate and endothelial dysfunction, or indicators that the arteries may be predisposed to premature thickening, in the blood vessels. This cardiovascular abnormality puts these women in line with coronary artery disease patients".

Could something as simple as a few more snacks per day be enough to minimize the risk of cardiovascular disease? O'Donnell says that more research is needed.

"We're only able to observe differences between estrogen-deficient groups at this point, but our findings certainly lead to further questions. If we can understand earlier how episodes of amenorrhea contribute to a woman's cardiovascular health down the line, it could be very important with regards to prevention. I think it behooves us to continue studying a little further."

Published 18/11/2013 by Adrienne Harry



Can financial incentives inspire exercise?

When it comes to sticking to an exercise plan, we're all looking for solutions to ensure that new healthy habits transform into long-term lifestyle changes. PhD candidate Marc Mitchell has published findings in the September online issue of the *American Journal of Preventive Medicine* suggesting that receiving coupons and vouchers for as little as five dollars can help people stick to new fitness regimes.

Under the guidance of Professors Jack Goodman and Guy Faulkner, Mitchell has completed a systematic review of research into the efficacy of financial incentives in inspiring lifestyle and health behaviour change, specifically in people who've experienced cardiac problems. His analysis suggests that these small rewards increase the odds that patients will maintain an active lifestyle in the longer term. Mitchell's project looked specifically at 1500 patients as they transitioned out of Toronto's Rehab's cardiac program, designed to help people with heart disease improve their strength and fitness to reduce their chances of future heart problems.

"Patients do great during the six-month program," observes Mitchell. "But a lot of them stop exercising after they leave. The idea is to offer a modest incentive to facilitate that transition to independent exercise." In the model that Mitchell is working on, patients will receive these incentives after submitting their daily exercise logs, through an online portal called, "BestLifeRewarded."

During the second phase of his project, Mitchell led patient focus groups to determine which types of incentives resonate most with the cardiac rehab patients. Many liked the idea of receiving parking vouchers to supplement their costly trips to the hospital, while others preferred grocery store vouchers or a chance to donate their incentive to a charity of their choice.

Mitchell predicts that the act of submitting the entries will serve as a stepping stone to developing increased awareness and continued patient engagement. "If they submit an empty entry, they'll still get the incentive," he explains. "Just doing that will continue to encourage them to self-monitor. We think of it as a gentle nudge; it's not supposed to be a carrot that we're dangling."

The final stage of the project – the launch of the pilot program – is set to begin later this fall.

Published 17/09/2013 by Valerie Iancovich

We're all looking for solutions to ensure that new healthy habits transform into long-term lifestyle changes.



KPE placement confirms student's passion for research

Mariana Boeira has only been at the University of Toronto since early June, but she already knows that coming to the Faculty of Kinesiology and Physical Education was a smart decision. The physiotherapy student is here to expand her research experience, visiting from the Pontifical Catholic University of Rio Grande do Sul in Porto Alegre, Brazil.

Boeira applied to come to U of T after one of her professors suggested she would be a good fit for the highly-competitive Mitacs Globalink program, which invites top undergraduate students from around the world to experience Canadian research and innovation.

“The application process was difficult and required a lot of details about my experiences and goals,” she explains. But her hard work paid off and Boeira was selected to come to the Faculty for 12 weeks to work under the mentorship of cardiac health expert Professor Scott Thomas.

“This international research program is a terrific opportunity to showcase some of the strongest elements of our program,” says Thomas. “Having top students like Mariana work in our labs enriches our projects and shows them the best of what U of T has to offer.”

Upon her arrival, Thomas arranged for Boeira to provide research support for three projects in the Faculty's cardiac lab, including one with a PhD student. “We study a lot about cardiac function, its problems and how to reduce cardiac risk factors in physiotherapy,” she says, explaining her past research into lifestyle modification and cardiovascular risk. “The research I'm participating in here is closely related to what I study in Brazil.” In the coming weeks, Boeira will also participate in projects at the Toronto Rehabilitation Institute.

So far, life in Toronto has been busy, but Boeira has says the adjustment has been smooth and inspiring. “I'm not homesick yet because there is so much to do!

I love research because you acquire both theoretical and practical knowledge,” she says. “I want to help others find better ways to deal with cardiac problems and understand prevention. I came here to see if research is really what I want to do. So far, U of T helping me to realize that yes, I want this!”

Published 16/07/2013 by Valerie Iancovich

Controlling blood pressure with a few squeezes a day



PhD candidate Danielle Bentley measures a subject's blood pressure in the radial artery as part of her research study.

Women, rejoice: if Danielle Bentley has any say in the matter, with a small amount of effort, you will be able to lower your risk for cardiovascular disease as you age.

Health Canada has found that the risk of developing cardiovascular disease increases four-fold for women after menopause; the disease is responsible for 40 per cent of their deaths. Bentley, a third-year PhD candidate in cardiovascular physiology at the Faculty of Kinesiology and Physical Education, is working with her supervisor, Professor Scott Thomas to help women prevent the onset of cardiovascular disease.

"One of the modifiable risk factors for cardiovascular disease is blood pressure," said Bentley, her eyes lighting up with excitement as she discusses her research. "If women can keep their blood pressure low enough, they may be able to keep cardiovascular disease at bay."

She acknowledges that there are prescription drugs available to control blood pressure, but Bentley wants to create an exercise-related solution that allows women to control their own health more directly. The solution she is preparing to test is an isometric handgrip exercise protocol that only takes a few minutes a day.

"Essentially, it's similar to squeezing a stress ball," said Bentley.

The exercise has been shown to reduce blood pressure in men; in fact, it is more effective than either running or lifting weights at reducing blood pressure, but it doesn't provide any of the secondary benefits of those exercises, such as weight loss. It is understudied in women, especially post-menopausal women; a group which Bentley says isn't studied often.

Bentley and Thomas are about to change all of that. They have done a pilot study and are preparing to embark upon a five-day, short-term study, testing a number of different exercise protocols to determine which is most effective at reducing blood pressure, as well as easiest for women to complete daily.

"We want the exercise to be something everyone can use, so they can complete it while they watch TV or ride on the TTC," said Bentley. "Encouraging individuals to adopt alternative means of blood pressure control, rather than pharmaceuticals, is the goal. There are a lot of ways to for everyone to be healthy, and health doesn't come in a bottle."

Through testing, they hope to find that blood pressure will drop consistently after women do the prescribed exercise. If it helps women in the short term, the next frontier will be long-term protection. Testing post-menopausal women who follow the exercise protocol over an eight-week period should help to determine whether the long-term changes are significant.

Published 14/11/2013 by Elaine Smith



Explaining the science of extreme human performance

When ultra-marathoner Ray Zahab took the final strides of his 7,500-kilometre journey across the blistering Sahara desert, his weary frame had whittled down from its pre-run 162 pounds to a meagre 119.

A collective gasp was heard throughout the crowd gathered at the Isabel Bader Theatre when Zahab shared this anecdote during his keynote address at the Faculty of Kinesiology and Physical Education's (KPE) Dec. 3 symposium, "Extreme Environments, Extraordinary Feats: How far can we push ourselves?"

Zahab was drained, dehydrated and mentally worn at the end of his run; the stories of strain that he shared at the event exemplified many of the scientific themes addressed before he took to the stage. KPE Professor Marius Locke started the night off by explaining how the body reacts on a cellular level to the stress of strenuous exercise in extreme heat, cold and other demanding environments.

Professor Judith Andersen from University of Toronto Mississauga shifted the conversation from the physical to the mental, explaining how the connection between mind and body can determine the degree to which stressors in extreme circumstances impact long-term health, in

particular for those individuals forced into dangerous environments (e.g., soldiers).

Professor Ira Jacobs, dean of KPE, shared the results of some of the research he led while working for the Department of National Defence. His findings contributed to healthier and more effective missions in high altitudes and extreme heat and under zero-gravity conditions. One example he gave highlighted a group of soldiers who lost up to 10 per cent of their body weight during a mission, drawing a parallel between how the bodies of soldiers and the bodies of athletes like Zahab cope with severe dehydration.

Following Zahab's talk, the evening concluded with a panel discussion, led by KPE Professor Greg Wells, who was the MC for the night. More than 250 event guests were invited to pose questions to the speakers; many were curious about connections between work in the field and real-life athletic and occupational applications. While each expert agreed that genetic predisposition and mental fortitude play a role in who excels under strenuous circumstances, they also emphasized that intense training and conditioning are vital in preparing the body to adapt to extreme physical challenges. Locke summed it up succinctly saying, "practice makes permanent."

Extreme athlete Ray Zahab captivated the audience at December's symposium.

"Those speakers were the ultimate combination," said Colin Henderson, a third-year kinesiology and physical education student, after hearing the panel discussion. "It was cool to see them bounce ideas off of each other like that."

Henderson took on his first marathon challenge through Zahab's impossible2possible program. For him, the symposium was an inspiring fusion of everyday lessons from the classroom and intensive in-the-field experiences.

Judith Chadwick, U of T's assistant vice-president of research services, was among the guests who attended the event, which was the Faculty's sixth in an ongoing series of public symposia.

"It was a fantastic night," said Chadwick. "It was a really interesting mixture of science and a more lay approach to the topic. It's so important to share research in venues like this. We, as universities, need to engage differently with our communities than we have historically. These symposia are a great example of how we can realize this goal."

Originally Published in *Pursuit* Spring 2014



Grad research offers clue to how muscles heal

Coaches create game plans, teach skills and offer guidance, all on a quest to build better athletes. Through his master's research, recent graduate Andrew Holwerda examined how the body can "coach" itself to enhance performance on a biochemical level.

Studying under Professor Marius Locke, Holwerda's thesis work focused on how muscles respond to concentric and eccentric phases of exercise. During concentric exercise, muscles shorten and generate tension while during eccentric exercise, muscles lengthen, incur damage and go in to recovery mode. In weight lifting, for example, the lifting itself is the concentric phase, while returning the weight to its starting position is the eccentric phase. Holwerda was particularly interested in this damage and recovery phase.

"Eccentric contractions stretch and lengthen the muscle, causing damage and encouraging a recovery phase to happen," says Holwerda. "That's why you feel sore after weightlifting or running. During this muscle lengthening, heat shock proteins [proteins that are produced when cells are exposed to heat or other stress] are synthesized by the muscle to help protect it from damage. I was interested in studying these proteins and how the muscle adapts to certain exercise."

Holwerda theorizes that the protective role of heat shock proteins explains why, over time, training becomes less painful and endurance increases. He compared concentric and eccentric

phases of exercise to see if heat shock proteins were synthesized in both instances. He found that concentric contractions were not enough of a stressor to the muscle for these proteins to synthesize, and that heat shock proteins responded more readily to muscle damage—a finding that may be important for future muscle protection research.

Through continued investigation, Holwerda sees an opportunity to help people who are more susceptible to contraction-induced muscle damage, including the elderly and those with muscular dystrophy. His findings could also be a step toward helping athletes improve performance by building endurance and power.

"This project could be the first stage in helping to improve muscle adaptation and strength, power and performance," says Holwerda, a former rugby athlete. "With future studies, we could possibly build some kind of training timeline to help protect muscle during training."

Holwerda defended his master's thesis on September 30 and is currently pursuing his PhD at Maastricht University in the Netherlands, where he continues to study muscle metabolism in humans through nutrition-based research.

Published 18/10/2013 by Adrienne Harry



ENDLESS POSSIBILITIES

Taking research to new heights

BY ALTHEA BLACKBURN EVANS

Earlier this year the Faculty received significant support from Iovate Health Sciences International, elevating the calibre of sport nutrition research at University of Toronto to an unprecedented level. Representing up to \$2 million in funding over the next six years, the gift is one of the largest private sector contributions to sport nutrition research at a Canadian academic institution.

The Iovate/Muscletech Metabolism and Sports Science Lab will be housed in the Goldring Centre for High Performance Sport, slated to open this year. Iovate funding will support the lab's research, which will break new ground in discovering healthy ways to fuel and replenish muscles taxed by exercise.

"Iovate is committed to advancing nutritional sciences that enhance performance and quality of life," said Iovate CEO Paul Gardiner. "We are thrilled to be partnering with one of the world's great research universities in supporting innovative research and knowledge generation that is such an integral component of Iovate's mission and vision."

The Iovate/Muscletech Metabolism and Sports Science Lab will be led by Professor Dan Moore, an expert in the study of the body's use of protein and other nutrients to fuel and recover from exercise. The lab's novel technologies, and the skills the recently-recruited Moore brings to the table, promise to attract top graduate students and create further collaboration with other leaders in the field.

The lab will feature state-of-the-art mass spectrometers, allowing researchers to analyze blood and muscle samples and understand exactly how muscle responds to specific exercise and nutrition.

Paul Gardiner, CEO of Iovate Health Sciences International

Professor Ira Jacobs, dean of the Faculty of Kinesiology and Physical Education, says that the partnership with Iovate will help U of T take the lead in determining optimal nutritional strategies for human performance, health and function – for novice fitness enthusiasts and elite athletes alike.

"This is a very exciting time for exercise and sport science research here at U of T, and beyond," said Jacobs. "This gift represents Iovate's vision and leadership and sets the tone for the kinds of collaborations and investments that will help us to achieve the full potential of the Goldring Centre for High Performance Sport." Moore also recently received funding from the Canada Foundation for Innovation to bolster his research in this area.

Originally Published in *Pursuit* Spring 2014

Dan Moore

REFUELLING THE ATHLETES

An outstanding athlete isn't nourished by determination and talent alone. As high performance training becomes increasingly intense, it's essential that a body pushed to its limits is replenished in efficient and healthy ways. Professor Dan Moore, who joined the Faculty in July, is poised to gain ground in this crucial field of nutrition and high performance sport when he moves to his new research space at Goldring. Plans for Moore's biochemistry lab include state-of-the-art equipment to home in on his research goals. "I'm interested in the role that nutrition can play in enhancing recovery from, and adaptation to, exercise. Specifically, I look at what types and what quality of protein can enhance muscle repair after exercise and therefore help the body to adapt to certain training programs."

A prize piece in the space will be the gas chromatography mass spectrometer. This highly-sensitive tool allows researchers to study how different nutrients (primarily protein, but also fats and carbohydrates) are metabolized in individuals and within muscle itself, tracking where they go in the body. "From that we can measure how much of each nutrient is incorporated into the muscle and therefore how quickly the muscle is repairing itself after exercise." While this technology exists elsewhere on campus, no one is yet using it to study muscle response to exercise training.

A lifelong sports enthusiast, Moore is excited to work at a centre so focused on elite athletes, but he is equally passionate about applying his research to broader populations, including children and the elderly. "We know that people lose muscle mass as they age. So how best can we target exercise and nutrition strategies to help hang on to that muscle and make sure that it's also high-quality? A lot of the findings in healthy, young individuals can be adapted to the needs of other populations. I find that really inspiring."



Originally Published in *Pursuit* Fall 2013 by Valerie Iancovich

Gillian White

REFINING RESEARCH

“The Goldring Centre was one of the reasons that I applied to the University of Toronto in the first place,” says graduate student Gillian White. The up-and-coming scholar, who defended her master's thesis in September, wants to know more about how to repair athletes' damaged muscles and how her findings could apply to broader populations. Come fall 2015, she'll be well-positioned to delve further into this topic, with standout lab space and unprecedented access to athletes in action.

White's work to date has focused on assessing the efficacy of cold water baths in muscle recovery, under the supervision of Professor Greg Wells. While cold water immersion has long been a post-training practice, White's research compared subjects' physiological responses to taking baths of varying temperatures to gain a better understanding of just how icy water needs to be in order to maximize recovery. Even among U of T athletes, temperatures can vary from a cold 20 degrees down to a frosty 10. Her findings could make recovery techniques more effective and efficient, while contributing to the broader understanding of muscle recovery.

In the very early days of the PhD program, White is still finalizing her focus but remains committed to generating research beyond the niche of high performance athletes. “My next study topic will be similar to my master's – something that applies to high performance sport, but also to general physiology and is more broadly applicable across the wider population.” Focusing on elite athletes represents one end of the spectrum, White says, which is highly valuable when trying to better understand the big picture. “Using them as a study population is logical because you can rather easily consider how your findings would apply across a broad range.”

While White has been working in one of the Faculty's newest labs in the Athletic Centre, she's eager to move to a space that integrates several areas of sport science research alongside training and competition. “We'll all be in the same area as the athletes and all those working with the athletes; just being exposed to how they do things will help to inform and improve how we do things.”

Originally Published in *Pursuit* Fall 2013 by Valerie Iancovich



KPE RESEARCH FUNDING AWARDED – 2013-2014

Investigators	Sponsor	Program	Title of Research Project	Awarded
PI: K Arbour-Nicitopoulos Co-PI's: KA Martin Ginis, AE Latimer, J Arkell, C Bourne, D Ditor, P Estabrooks, S Ginis	McMaster University	Rick Hansen Institute Subgrant	Development of SCI Action Canada's Knowledge Mobilization Training Series	2,406.60
PI: K Arbour-Nicitopoulos	University of Toronto	Internal KPE Faculty Research Grant	Examining the barriers and facilitators to the implementation of Get in Motion and Passez a l'Action	4,976.00
PI: M Atkinson	SSHRC	Purpose 1 - Small scale research	Ashtanga yoga culture on Toronto	1,629.00
PI: P Donnelly	SSHRC	Purpose 1 - Small scale research	Gender equity in sports events	1,628.00
PI: G Faulkner Co-PI's: C Sabiston, K Arbour-Nicitopoulos	Canada Foundation for Innovation	Leaders Opportunity Fund	MPARC: Mental Health and Physical Activity Research Centre	577,714.00
PI: G Faulkner	Canadian Cancer Society	Operating Grant	Run to Quit: A programme evaluation	9,875.00
PI: G Faulkner Co-PI's: C Sabiston, K Arbour-Nicitopoulos, S Alibhai, J Jones	Prostate Cancer Canada	Research Grant	Rise tx: A feasibility trail of a mobile application for reducing sedentary behaviour among prostate cancer	164,102.00
PI: G Faulkner Co-PI's: C Sabiston, K Arbour-Nicitopoulos	Ontario Ministry of Research and Innovation	Leaders Opportunity Fund	MPARC: Mental Health and Physical Activity Research Centre	577,714.00
PI: G Faulkner Co-PI: C Sabiston	University of Toronto	Internal KPE Faculty Research Grant	The U of T Longitudinal Health Behaviour Cohort Study	4,800.00
PI: G Faulkner	University of Waterloo	CIHR Subgrant	PICDP- Alicia Luciani -CIHR Training Grant for Population Intervention for Chronic Disease Prevention.	20,000.00
PI: D Frost	University of Toronto	Internal KPE Faculty Research Grant	Assessing the inter- and intra-observer reliability in spine flexion during the performance of commonly administered exercises: Contrasting the observation skills of firefighters, students and practicing kinesiologists	5,000.00
PI: C Fusco	SSHRC	Purpose 1 - Small scale research	Desire and bodies in place	1,628.00
PI: C Fusco Co-PI: M Brownrigg	University of Toronto	Internal KPE Faculty Research Grant	PanAm Pride: The opportunity of the Games' positive space in physical activity and sport at the University of Toronto	4,950.00
PI: J Goodman Co-PI's: P Backx, KA Connelly, P Dorian, S Thomas	CIHR	Operating Grant	Cardiac consequences on excessive exercise	199,196.00
PI: G Kerr Co-PI: A Stirling	Coaching Association of Canada	Operating Grant	Examining the Relationship between Previous Experience and Performance on the NCCP Make Ethical Decisions Online	12,764.00
PI: G Kerr Co-PI: A Stirling	Higher Education Quality Council of Ontario	Research Agreement	What is an internship?: Inventory and analysis of "internship" opportunities available to postsecondary	44,046.60

Investigators	Sponsor	Program	Title of Research Project	Awarded
PI: M MacNeill	University of Toronto	Internal KPE Faculty Research Grant	Social media, athletes' rights & engagement in the sporting digital economy	4,980.00
PI: L Mainwaring Co-PI's: P Comper, D Richards, M Hutchison	CIHR - Ontario Neurotrauma Foundation	Catalyst Grant	Stress markers in concussed athletes.	97,190.00
PI: L Mainwaring	University of Toronto	Internal KPE Faculty Research Grant	Stress markers in concussed athletes.	2,674.00
PI: D Moore Co-PI's: G Courtney-Martin, P Pencharz, S Thomas	Ajinomoto Co. Inc.	Innovation Alliance Program	Amino acid metabolism and basic requirements in active growing youth	249,902.00
PI: D Moore	Canada Foundation for Innovation	Leaders Opportunity Fund	High performance muscle metabolism suite	180,830.00
PI: D Moore	Ontario Ministry of Research and Innovation	Leaders Opportunity Fund	High performance muscle metabolism suite	180,830.00
PI: D Moore	University of Toronto	Internal KPE Faculty Research Grant	Development of intrinsically-labeled egg proteins for the study of human protein metabolism	4,979.00
PI: C Sabiston Co-PI's: S Amireault, K Arbour-Nicitopoulos, J Bender, P Goodwin, J Jones, K Tamminen	Canadian Cancer Society Research Institute	Innovation Grant	Connecting peers in motion: A dyadic lifestyle activity intervention for women diagnosed with cancer	191,405.00
PI: C Sabiston	McGill University	IHRT/CIHR Sub Grant	Jason Lacombe - Fellowship - The impact of physical inactivity and sedentary behaviour on mental health among breast cancer survivors	10,000.00
PI: C Sabiston Co-PI's: J Brunet, PRE Crocker, KC Kowalski, DE Mack, PM Wilson	SSHRC	Insight Grant	Understanding and improving body-related self-conscious emotion in adolescent girls' sport.	105,928.00
PI: C Sabiston Co-PI: G Faulkner	University of Toronto	Internal KPE Faculty Research Grant	Building CURVES, reducing nerves?	5,000.00
PI: K Tamminen Co-PI's: G Kerr, P Donnelly	SSHRC	Partnership Development Grant	Potential for change? Exploring the culture of youth hockey	91,360.00
PI: K Tamminen	University of Toronto	Internal KPE Faculty Research Grant	Athlete interactions in team sports: Emotion regulation, cohesion, and enjoyment.	3,280.00
PI: S Thomas	CIHR	Doctoral Research Award	Danielle Bentley - Doctoral - Evaluating the use of isometric handgrip exercise as a stimulus for long-term blood pressure	70,000.00
PI: S Thomas	University of Toronto	Internal KPE Faculty Research Grant	Enhanced assessment of vascular function	5,000.00
PI: L Tremblay	University of Toronto	Internal KPE Faculty Research Grant	Sensorimotor adaptations in stroke patients using robotic guidance.	4,992.00

TOTAL: 2,840,779

PUBLICATIONS (2013-2014)

Books

Kidd, B. (2014). *Critical support for sport*. London: Routledge.

Monaghan, L., & **Atkinson, M.** (2014). *Challenging myths of masculinity*. Ashgate press.

Taylor, D. B. (2014). *Writing skills in nursing and healthcare: A guide to completing successful dissertations and theses*. London: Sage Publications (UK).

Book Chapters

Atkinson, M. (2013). Free running and the essence of being. In B. Carrington, & D. Andrews (Eds.), *A companion to sport*. Oxford: Wiley-Blackwell

Atkinson, M. (2013). Mischief managed: On ethnographic ethics in physical culture. In I. Waddington, A. Smith, & K. Green (Eds.), *Research in the sociology of sport*.

Atkinson, M. (2013). Norbert Elias: The quest for excitement in parkour. In E. Pike, & S. Beames (Eds.), *Outdoor adventure and social theory*. London: Taylor & Francis.

Atkinson, M. (accepted). Researching sport. In R. Giuliannotti (Eds.), *Sociology of sport handbook*.

Atkinson, M., & De Lisio, A. (accepted). The sociology of 'Sport Engineering'. In K. Young, & C. Okada (Eds.), *Sport legacies and social development*.

Atkinson, M., & Gibson, K. (2014). Communion without collision: Animals, sport and interspecies co-Presence. In M. Gilbert, & J. Gillett (Eds.), *Sport, animals and society*. New York: Routledge

Crocker, P. R. E., & **Tamminen, K. A.** (2014). Coping. In R. C. Eklund, & G. Tenenbaum, (Eds.), *Encyclopedia of sport and exercise psychology*. Thousand Oaks: Sage.

Donnelly, P. (2014). Playing with gravity: Mountains and mountaineering. Reprinted in: W. Vamplew (Eds.), *Critical concepts in sports history*. London: Routledge.

Donnelly, P. (2014). Sport and human development. *The role of sport in the training of human talent*. Quito, ECUADOR: Coordinating Ministry for Knowledge and Human Talent.

Donnelly, P. (2013). Sport participation. In L. Thibault, & J. Harvey (Eds.), *Sport policy in Canada* (pp. 177-213). Ottawa: University of Ottawa Press.

Donnelly, P., & Atkinson, M. (in press). Where history meets biography: Toward a public sociology of sport. In R. Field (Eds.), *Contested terrain: The continuing struggle for sport and recreation – Essays in Honour of Bruce Kidd*. Toronto: University of Toronto Press.

Faulkner, G., & Gorczynski, P. (2014). Evidence of impact of physical activity on schizophrenia. In A. Clow, & S. Edmunds (Eds.), *Physical activity and mental health: Theory and practical applications*. Champaign, IL: Human Kinetics.

Faulkner, G., Gorczynski, P., & Arbour-Nicitopoulos, K. (2013). Exercise as an adjunct treatment for schizophrenia. In P. Ekkekakis (Eds.), *Routledge handbook of physical activity and mental health*. Oxon: Routledge.

Faulkner, G., & Mammen, G. (2013). Exercise and mental health. In R. C. Eklund, & G. Tenenbaum (Eds.), *Encyclopedia of sport and exercise psychology*. London: Sage.

Fusco, C. (2014). Transcending the (white) straight mind in sport. In J. Hargreaves, & E. Anderson (Eds.), *Routledge handbook of sport, gender & sexuality* (pp. 435-442). London: Routledge.

Kehler, M., & **Atkinson, M.** (2013). Examining the (Em)bodied boundaries of high school locker rooms. In R. Brooks, M. McCormack, & K. Bhopal (Eds.),

Contemporary Debates in the Sociology of Education. England: Palgrave Macmillan

Kerr, G., & Stirling, A. (in press). Applying a critical ecological approach to the issue of athlete abuse in sport. In R. Schinke, K. MacGannon, & B. Smith (Eds.), *The psychology of sub-culture in sport and physical activity: Critical perspectives*. Routledge.

Kerr, G., & Stirling, A. (in press). Safeguarding athletes from emotional abuse: lessons learned from the education sector. In M. Harthill, & M. Lang (Eds.), *Safeguarding, child protection and abuse in sport: International perspectives in research, policy and practice*. Routledge Press.

Kidd, B. (2013). Sport and Peace. In Kalevi Olin (Ed.), *Sport, Peace and Development: International Workers' Sport 1913-2013*. Vienna: Sportverlag.

Kidd, B. (2013). Canada and sport for development. In Jean Harvey and Lucie Thibault (Eds.), *Canadian Sport Policy*. Ottawa: University of Ottawa Press.

Kidd, B. (2013). Homage to the sisterhood. In Lorraine Greaves, Sandra Kirby and Marion Lay (Eds.), *Playing it Forward: 50 years of Women and Sport in Canada*. London: Feminist History Society.

Sabiston, C. M. (2014). Body awareness. In R. C. Eklund, & G. Tenebaum (Eds.), *Encyclopedia of sport and exercise psychology*. Thousand Oaks: Sage.

Sabiston, C. M. (2014). Self-awareness. In R. C. Eklund, & G. Tenebaum (Eds.), *Encyclopedia of sport and exercise psychology*. Thousand Oaks: Sage.

Sabiston, C. M. (2014). Self-construal. In R. C. Eklund, & G. Tenebaum (Eds.), *Encyclopedia of sport and exercise psychology*. Thousand Oaks: Sage.

Sabiston, C. M. (2014). Social comparison. In R. C. Eklund, & G. Tenebaum (Eds.), *Encyclopedia of sport and exercise psychology*. Thousand Oaks: Sage.

Sabiston, C. M., & Amireault, S. (2013). La douleur en mouvement: L'activité physique et le cancer [Pain in movement: Physical activity and cancer]. *Douleur en mouvement: Sectes du troisième Colloque francophone sur la douleur*.

Sabiston, C. M., & Bessette, N. (2014). Self-discrepancy. In R. C. Eklund, & G. Tenebaum (Eds.), *Encyclopedia of*

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Sabiston, C. M., & Castonguay, A. (2014). Body dissatisfaction. In R. C. Eklund, & G. Tenebaum (Eds.), *Encyclopedia of sport and exercise psychology*. Thousand Oaks: Sage.

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Sabiston, C. M., & Pila, E. (2014). Self-conscious emotions. In R. C. Eklund, & G. Tenebaum (Eds.), *Encyclopedia of sport and exercise psychology*. Thousand Oaks: Sage.

Sabiston, C. M., & Pila, E. (2014). Social comparative emotions. In R. C. Eklund, & G. Tenebaum (Eds.), *Encyclopedia of sport and exercise psychology*. Thousand Oaks: Sage.

Stirling, A., & Kerr, G. (in press). In the name of performance: Threats, belittlement, and degradation. In J. Baker, J. Fraser-Thomas, & P. Safia (Eds.), *Sport and health*.

Tamminen, K. A., Crocker, P. R. E., & McEwen, C. E. (2014). Emotional experiences and coping: How to promote positive adaptational outcomes in sport. In R. Gomez, R. Resende, & A. Albuquerque (Eds.), *Positive human functioning from a multidimensional perspective* (pp. 143-162). New York: Nova Science.

Tamminen, K. A., & Gaudreau, P. (2014). Coping, social support, and emotion regulation in teams. In M. R. Beauchamp, & M. A. Eys (Eds.), *Group dynamics in exercise and sport psychology: Contemporary themes* (2nd ed., pp.222-239). New York: Routledge.

Young, K., & Atkinson, M. (2013). Sporting violence and deviant bodies. In B. Carrington, & D. Andrews (Eds.), *A companion to sport*. Oxford: Wiley-Blackwell.

Peer Reviewed Publications (2013-2014)

Behavioural Sciences

Concussion Program - Hutchison; Mainwaring; Richards

The Faculty of Kinesiology and Physical Education's Concussion Program is a proud leader in research of sport and physical activity related concussions. We support and conduct research initiatives that are continuing to advance our understanding of the injury, as well as identify potential prevention strategies, and improve clinical care of those who have suffered a concussion while participating in sport or physical activity.

We have three distinct components working in conjunction with each other to be the leaders in concussion prevention, management, and education. Our research environment allows us to identify potential prevention strategies as well as advance our understanding of concussion to help us better treat and manage the injury. We have a number of education initiatives for students, athletes, parents, coaches, healthcare providers, and administrators to help prevent, recognize, and manage concussions. Our clinical arm – the David L. MacIntosh Sport Medicine Clinic – provides access and care from the leaders in sport medicine with specific expertise of concussion.

Hutchison, M. G., Lawrence, D. W., Cusimano, M. D., & Schweizer, T. (2014). Head trauma in mixed martial arts. *American Journal of Sports Medicine*. doi:10.1177/0363546514526151 [Epub ahead of print].

Maher, M., Hutchison, M. G., Cusimano, M., Comper, P., & Schweizer, T. (2014). Concussions and heading in soccer: an evidence based review of the incidence, mechanisms, and neurocognitive outcomes. *Brain Injury*, 28, 271-285. doi:10.3109/02699052.2013.865269.

Cusimano, M., Chipman, M., Donnelly, P., & Hutchison, M. G. (2014). Effectiveness of an educational video on concussion knowledge in minor league hockey players. *British Journal of Sports Medicine*, 48, 141-146. doi:10.1136/bjsports-2012-091660.

Lawrence, D., Hutchison, M. G., Cusimano, M., Singh, T., & Li, L. (2013). The development of an observational tool to code knockouts and technical knockouts in mixed martial arts (MMA). *Clinical Journal of Sport Medicine*. PMID:24378405.

Silverman, J., Hutchison, M. G., & Cusimano, M. D. (2013). Association between neighbourhood marginalization and pedestrian and cyclist collisions in Toronto intersections. *Canadian Journal of Public Health*, 105, e405-409.

Hutchison, M. G., Comper, P., Meeuwisse, W., & Echemendia, R. (2013). A systematic analysis of National Hockey League concussions, part I: Who, when, where and what? *British Journal of Sports Medicine*. doi:10.1136/bjsports-2013-092234. [Epub ahead of print].

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Health & Exercise Psychology Unit - Arbour-Nicitopoulos; Faulkner; Sabiston

In the Health and Exercise Psychology Unit, we study the antecedents and consequences of physical (in)activity, sport and sedentary behaviour across the lifespan in healthy and chronically ill populations. Much of our research is focused on identifying theory-based determinants of physical (in)activity, sport and sedentary behavior using a wide range of qualitative and quantitative methodologies.

The overarching aim of the research conducted in the Health and Exercise Psychology Unit is to use a multidisciplinary approach for addressing three critical questions:

- What factors cause or prevent physical (in)activity, sport and sedentary behaviour?
- How does participation in physical activity and sport influence psychological well-being?
- How are effective physical activity and sport promotion initiatives designed, delivered and disseminated for public health?

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Sport & Performance Psychology Laboratory – Kerr; Stirling; Tamminen

The Sport & Performance Psychology Laboratory investigates psychological and social issues facing athletes of all ages, coaches, and parents of youth & adolescent athletes. Those key questions include:

- athletes' stress, emotion and coping in sport
- social relationships and interpersonal processes between athletes, coaches and parents
- improving athletes' participation and enjoyment in sport, and the protection of young athletes
- coaching effectiveness and education

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Biomechanics

Biomechanics & Injury Prevention Lab – Beach; Frost

The overarching aim of our research is to develop ways to enhance, restore, and maintain the capacity of the musculoskeletal system to withstand physical demands of work and sport. To achieve this, we bridge theory-to-practice gaps in kinesiology through the incorporation of fundamental knowledge of biomechanics and motor behaviour into qualitative and quantitative analyses of human movement. Our current focus is on devising safe, effective, and sustainable education- and exercise-based performance enhancement and injury prevention strategies for individuals who engage in physically demanding athletic and occupational activities; however, this research will yield new knowledge, tools, and techniques that are broadly applicable across the health-to-performance spectrum.

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Exercise Physiology

Exercise & Cardiac Health Lab – Goodman

The focus of our laboratory is heart function and exercise. Key questions we are trying to answer include:

- what are the cardiac consequences of ‘excessive’ exercise performed over a lifetime
- what are the mechanisms of exercise-induced cardiac fatigue
- how does the heart adapt to acute and chronic exercise in health and disease

We have an interest in the spectrum of health, from long-standing athletes to clinical populations including heart failure, hypertension and atrial fibrillation. Related studies examining peripheral vascular function and the effects of exercise are also part of our investigations.

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Health & Performance Lab – Thomas; Taha

The Human Physiology and Performance Laboratory conducts research that addresses three critical questions:

- How can we make exercise more accessible and effective for people with chronic health conditions
- How can we use exercise training and assessment to help athletes achieve healthy high performance
- How can we better understand the relations among physical activity, appetite and body composition in children and youth, both boys and girls

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Nolan, R. P., Liu, S., Feldman, R., Dawes, M., Barr, S., Lynn, H., Gwady-Sridhar, F., **Thomas**, S. G., **Goodman**, J., Oh, P., Kaczorowski, J., Chessex, C., Hachinski, V., & Shoemaker, K. (2013). Reducing risk with e-based support for adherence to lifestyle change in hypertension (REACH): Protocol for a multi-centered randomized controlled trial. *BMJ Open*, 3, 8 e003547. doi:10.1136/bmjopen-2013-003547.

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Human Physiology Research Unit – Jacobs; Wells

The Human Physiology Research Unit is interested in the experimental exploration of human physiology in physical activity, exercise, extreme environments and chronic disease.

The overall goal of our research is to discover and evaluate:

- 1) mechanisms of pathophysiology in chronic disease,
- 2) mechanisms of physiological adaptation to exercise and extreme environments; and,
- 3) the physiological impact of physical activity.

The outcome of these studies will be used to guide therapeutic interventions, as well as training and physical activity recommendations for people across the human spectrum.

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Cohen, M., Syme, C., Deforest, M., **Wells**, G., Detzler, G., Cheng, H. L., McCrindle, B., Hanley, A., & Hamilton, J. (2014). Ectopic fat in youth: the contribution of hepatic and pancreatic fat to metabolic disturbances. *Obesity (Silver Spring)*, 22, 1280-1286. doi:10.1002/oby.20674. [Epub ahead of print].

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Quesnele, J. J., Triano, J. J., Noseworthy, M. D., & **Wells**, G. D. (2014). Changes in vertebral blood flow following various head positions and manipulation. *Journal of Manual & Physical Therapy*, 37, 22-31.

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White, G., & **Wells**, G. D. (2013). Cold-water immersion & other forms of cryotherapy: Physiological changes, potential mechanisms, and efficacy for recovery from high intensity exercise. *Extreme Physiology & Medicine*, 2, 26. doi:10.1186/2046-7648-2-26.

Muscle Physiology/Applied Muscle Health Lab – Amara, Locke

Locke, M. (2013). The effect of heat stress on skeletal muscle contractile properties. *Cell Stress & Chaperones*, 19, 519-527.

Moola, F. J., Gairdner, S. E., & **Amara**, C. E. (2013). Exercise in the care of patients with Anorexia Nervosa: A systematic review of the literature. *Mental Health & Physical Activity*, 6, 59-68.

Schmitt, B., vonBoth, I., **Amara**, C. E., & Schulze, A. (2013). Quantitative assessment of metabolic changes in the developing brain of C57BL/6 mice by in vivo proton magnetic resonance spectroscopy. *Journal of Alzheimers Disease & Parkinsonism*, 3, 129. doi:10.4172/2161-0460.1000129.

Nutrition & Exercise Metabolism Lab – Moore

Skeletal muscle is the engine that drives human health and performance. Understanding how this tissue responds to nutrition and physical activity is essential to unlocking the keys that will lead to optimal human health and well-being. The Nutrition & Exercise Metabolism Lab investigates questions of:

- Effects of exercise and nutrition on protein metabolism in humans
- Mechanisms of skeletal muscle remodelling
- Role of nutrition in the recovery from and adaptation to exercise

Areta, J. L., Burke, L. M., Camera, D. M., West, D. W., Crawshay, S., **Moore**, D. R., Stellingwerff, T., Phillips, S. M., Hawley, J. A., & Coffey, V. G. (in press). Reduced resting skeletal muscle protein synthesis is rescued by resistance exercise and protein ingestion following short term energy deficit. *American Journal of Physiology: Endocrinology & Metabolism*.

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Churchward Venne, T. A., Breen, L., Di Donato, D., Hector, A. J., Mitchell, C. J., **Moore**, D. R., Stellingwerff, T., Breuille, D., Offord Cavin, E., Baker, S., & Phillips, S. M. (2014). Leucine supplementation of a low protein mixed macronutrient beverage enhances myofibrillar protein synthesis in young men: a double blind randomized trial. *American Journal of Clinical Nutrition*, 99, 276-286.

Grubb, A., Joannise, S., **Moore**, D. R., Bellamy, L. M., Mitchell, C. J., Phillips, S. M., & Parise, G. (2014). IGF 1 co localizes with muscle satellite cells following acute exercise in humans. *Applied Physiology, Nutrition, & Metabolism*, 39, 514-518.

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Professor Emeritus Dr Roy Shephard

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Bouhleb, H., **Shephard**, R. J., Gmada, N., Zouhair Tabka, Z., Pérès, G., & Bouhleb E. (2013). Effect of Ramadan observance on maximal muscular performance of trained men. *Clinical Journal of Sports Medicine*, 23, 222-227.

Bouhleb, H., **Shephard**, R. J., Adela, H., Bigard, X., Tabka, Z., & Bouhleb, E. (2013). Ramadan observance and aerobic exercise in male Karatekas. *Health & Fitness Journal of Canada*, 6.

Burr, J., Montelpare, W. J., & **Shephard**, R. J. (2013). Does adventure sports have a role in health promotion? *Canadian Family Physician*, 59, 1311-1313.

Chelly, M. S., Hermassi, S., Aouadi, R., & **Shephard**, R. J. (2014). Effects of 8-weeks in-season plyometric training on upper and lower limb performance of elite adolescent handball players. *Journal of Strength Conditioning Research*, 28, 1401-1410. doi: 10.1519/JSC.0000000000000279

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Warburton, D. E. R., Charelsworth, S., Foulds, H. J. A., McKenzie, D. C., **Shephard**, R. J., & Bredin, S. D. (2013). Qualified Exercise Professionals: Best Practice for Work with Clinical Populations. *Canadian Family Physician*, 59, 759-761.

Neuro-Motor Control

Centre for Motor Control – Welsh, Tremblay

The ability to move accurately, efficiently, and safely is fundamental to the success and survival of people in any society in the world. For this reason, an in-depth understanding of the neural and cognitive mechanisms that lead to motor control, learning, and development is critical to a number of applied disciplines; including, but not limited to, health sciences, biomedical engineering, healthy high performance, computer sciences, and robotics. Some of the key research questions of the Centre for Motor Control are:

- Sensorimotor mechanisms during voluntary actions
- Multisensory combination and integration processes
- Effects of practice on sensorimotor integration

Böckler, A., van der Wel, R. P., & Welsh, T. N. (accepted). Catching eyes: Effects of social and non-social cues on attention capture. *Psychological Science*.

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Welsh, T. N., McDougall, L. M., & Paulson, S. D. (accepted). The personification of animals: Coding of human and nonhuman body parts based on posture and function. *Cognition*.

Welsh, T. N., Neyedli, H., & Tremblay, L. (2013). Refining the time course of facilitation and inhibition in attention and action. *Neuroscience Letters*, 554, 6-10. doi: 10.1016/j.neulet.2013.08.055.

Wong, L., Manson, G. A., Tremblay, L., & Welsh, T. N. (2013). On the relationship between the execution, perception, and imagination of action. *Behavioural Brain Research*, 257, 242- 252. doi:10.1016/j.bbr.2013.09.045.

Socio-Cultural & Physical Cultural Studies

Atkinson, Darnell, Donnelly, Fusco, MacNeill

The Socio-Cultural and Physical Cultural Studies unit investigates the sociology of physical activity, sport and health. This ranges across a broad range of topics including, but not limited to:

- Accessible and equitable ‘sport for all’
- An educational mandate for sport in educational institutions
- Athletes’ rights and relationships with the media
- Bioethics and biopedagogies
- Children’s play
- Cultural geographies of children and youth’s physical activity and health environments
- Humane and healthy high performance sport
- International development and ‘Sport for Development and Peace’
- Olympic television production ethnographies
- Poststructuralist and feminist theories of the body, gender and sexuality
- Sport, race and post-colonialism
- Social movements and activism in sport
- Violence, aggression and health
- Visual media methodologies
- Youth masculinities, health and sexualities

Alexander, S. A., Frohlich, K. L., & Fusco, C. (in press). “Active play may be lots of fun...but it’s certainly not frivolous”: The emergence of active play as a health practice in Canadian public health. *Sociology of Health & Illness*.

Alexander, S.A., Frohlich, K.L., & Fusco, C. (in press). Problematizing ‘Play for Health’ discourses through children’s photo-elicited narratives. *Qualitative Health Research*.

Alexander, S. A., Fusco, C. & Frohlich, K. L. (in press). “You have to do 60 minutes of physical activity per day... I saw it on TV.”: Children’s play narratives in the context of the public health discourse of playing for health. *21st Sociology of Health & Illness Monograph - Children’s Health and Well-being: policy debates and lived experience*.

Donnelly, P. (2013). Sport and social inequality: Recent Canadian research on sport participation / Le sport et les inégalités sociales: Une recherche récente sur la participation sportive au Canada. *Canadian Journal for Social Research*, 3, 1-23.

Donnelly, P. (2013). What if the players controlled the game?: A radical proposal concerning the crisis of governance in sport. *EAST – East Asian Sport Thoughts: The International Journal for the Sociology of Sport*, 3, 25-50.

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FACULTY OF KINESIOLOGY & PHYSICAL EDUCATION