ANNUAL REPORT 2019

Research Facility Manager, Derek Quinlan, testing the Audio Dome in the Western Interdisciplinary Research Building. Photo taken by Frank Neufeld.

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The Brain and Mind Institute

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DIRECTOR'S STATEMENT

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The Brain and Mind Institute

DR. INGRID JOHNSRUDE
BMI Director
Western Research Chair,
Cognitive Neuroscience

When I came to Western University in 2014, I hoped to support and serve the exceptional neuroscience community that was growing in London. I was therefore thrilled when I was selected to be the new Director of Western's Brain and Mind Institute (BMI), succeeding founding Director Mel Goodale in February 2019.

THE BRAIN AND MIND INSTITUTE BEGINNINGS

Mel Goodale led the BMI for nearly 20 years, from its inception in 2000 as the Centre for Brain and Mind. The stellar research of Centre members, and Mel's tireless advocacy, ensured University support that enabled Western to attract a several positions to the Centre including a Canada Excellence Research Chair, in 2011. The Centre was also granted Institute status that year, becoming the BMI. Under Mel's leadership, cognitive neuroscience and neuroimaging at Western coalesced around the BMI, and cognitive neuroscience was selected as the first Cluster of Research Excellence by the University in 2013. The Cluster award provided a $12.5M investment and 6 faculty hires, which fuelled a successful $66M application to the Canada First Research Excellence Fund (CFREF), founding the BrainsCAN initiative. Under the CFREF mandate to turn "key strengths into world-leading capabilities", BrainsCAN is enabling Western to recruit the best and brightest faculty and trainees, build upon nascent strengths in computational neuroscience, spark new collaborations, and broaden research participation from the community and from clinical populations.

THE YEAR IN REVIEW AND LOOKING FORWARD

When I succeeded to the BMI directorship in February of 2019, the BMI was in a strong position. Our biggest strength was and remains our wonderful staff, trainees, and principal investigators. BMI researchers share a common phenotype: they are positive, energetic, collaborative, creative, and highly productive. Principal investigators supervise large numbers of graduate students and postdoctoral fellows, and engage in hundreds of national and international collaborations across six continents. These researchers are fortunate to have a highly dedicated and accomplished support staff to enable cutting-edge research and to streamline administrative needs. BMI also has state-of-the-art facilities: these include the shared human cognitive neuroscience research facility, and spaces for PIs and trainees, in the new Western Interdisciplinary Research Building (WIRB); access to world-class imaging facilities in the Robarts' Centre for Functional and Metabolic Mapping and at the Lawson Health Research Institute; and state of the art facilities for research in comparative models. In 2017 BMI researchers were awarded a $3.7M CFI/OIF Infrastructure Fund award which has enabled the purchase of new non-invasive brain imaging and brain stimulation tools for human cognitive neuroscience, expanding our ability to learn more about special populations, including people with severe traumatic brain injury and impaired consciousness, and children born premature, and those with specific learning disabilities or autism.

Although BMI has a long history of interdisciplinary collaboration, this expanded considerably in 2019. Groups in clinical neuroscience, computation, applied neuroscience and engineering at Western and across the city were eager to be part of, and collaborate with, the BMI. One of my first undertakings was to meet with people in such groups, forging connections and discussing solutions to unmet research needs. In 2019 Western also hired several new faculty members in educational neuroscience, clinical neuroscience, and computational neuroscience, further enhancing our research capacity.

Spring 2019 saw the official launch of "OurBrainsCAN", a community participant recruitment and management tool supported by BrainsCAN funding and spearheaded by Dr Laura Gonzalez-Lara. OurBrainsCAN will ensure that our research is equitable and inclusive, and that individuals from all walks of life can participate. Conducting research with participants from the community (rather than focusing on undergraduate students) ensures that our findings are more relevant and impactful. The public outreach that the registry enables will raise awareness of our research, and engages the community and community organizations in the scientific enterprise.

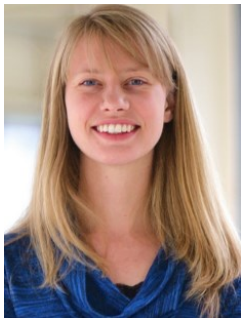
When ~30 cognitive neuroscience investigators and their labs moved into the WIRB in early 2018, they were coming from a variety of physical locations and organizational structures. Through 2019, we continued the work required to create a coherent and efficient organization for the human cognitive neuroscience facility in WIRB. The long-standing spirit of sharing equipment, personnel and other resources was enhanced by the new CFI-funded infrastructure and by hiring of centralized BrainsCAN-funded personnel. We are developing policies and procedures, including a fee-for-service framework, to ensure the long-term sustainability of this important shared facility.

The BMI will continue to flourish and evolve in 2020. Some trainees will move on to careers in academia and industry, and we will continue to diversify as we welcome new faculty, students, and postdoctoral fellows. We will become even more prominent internationally as our reputation for world-class neuroscience research and training continues to grow!

BMI STEERING COMMITTEE
2019 - 2020 MEMBERS

Since 2013, the Brain and Mind Institute has been governed by a Steering Committee that meets on a monthly basis to discuss the development of policies and procedures for the institute, space allocation and the optimization of research resources, the selection of student and postdoctoral awardees, application reviews for BMI membership, and the preparation of the annual report. Terms of Reference for the Steering Committee and Meeting Minutes are available to view and download from the BMI website.

This committee consists of the BMI Director, six Core Members, and a representative from each of the following constituencies: Associate Members, graduate students, postdoctoral researchers, as well as administrative staff.

INGRID JOHNSRUDE DIRECTOR & CHAIR	ROY EAGLESON CORE MEMBER	JESSICA GRAHN CORE MEMBER	MARC JOANISSE CORE MEMBER	STEFAN KÖHLER CORE MEMBER	JUILIO MARTINEZ-TRUJILLO CORE MEMBER
					
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RYAN STEVENSON CORE MEMBER	MARCO PRADO ASSOCIATE MEMBER	DOUGLAS KEDDY WESTERN RESEARCH ADVISOR	KASEY VAN HEDGER POSTDOCTORAL REPRESENTATIVE	MAGGIE PRENGER GRADUATE REPRESENTATIVE	FLORENCE LOURDES ADMINISTRATIVE STAFF REPRESENTATIVE
					
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COGNITIVE NEUROSCIENCE RESEARCH

AND THE BRAIN AND MIND INSTIUTE

OVERVIEW OF COGNITIVE NEUROSCIENCE

The study of the human brain is one of the most rapidly growing scientific enterprises of the 21st Century. The explosion in research linking neurobiology of the brain to complex human activities is no longer simply confined to the laboratory and to clinical applications, but has begun to inform fundamental questions about the nature of human consciousness and what it means to be human. Research on the relationship between the human brain and mind even influences our understanding of world economies and the behaviour of the marketplace – and promises to give us new insights into why some children, but not others, fail to flourish in the classroom. Not a day goes by without some sort of brain-related story appearing in major newspapers or other media outlets. Western has been a major contributor to these news headlines. In fact, over the past decade, Western has emerged as a leader in research on the relationship between brain and mind – a field known as ***Cognitive Neuroscience***.

All of this led to the creation of the Brain and Mind Institute (BMI) at Western in 2011.

THE BMI'S OBJECTIVES

- Accelerating research and research translation in cognitive neuroscience;
- Training highly qualified personnel;
- Forging national and international collaborations in cognitive neuroscience; and
- The facilitation of successful grant applications, both within the BMI and with other institutes and research groups at Western and beyond.

The BMI brings together research programs in cognitive neuroscience from across the campus -- programs that are already outstanding – and takes them to the next level by providing unparalleled research and training facilities. Since its inception, the BMI has been immensely productive; we have attracted substantial funding from provincial, federal, and international sources, and have been recognized as a successful research enterprise by both the scientific community and general public. We look forward to creating even more opportunities to foster research in cognitive neuroscience that is unmatched by any other research institute in the world.

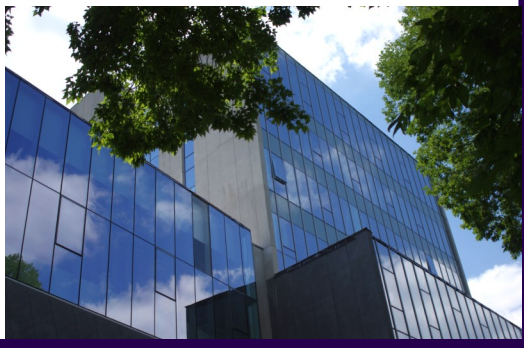
INTEGRATIVE APPROACH

Cognitive neuroscience is a new interdisciplinary endeavour that seeks an understanding of how the brain gives rise to mind. A range of disciplines – including psychology, linguistics, neurophysiology, neuroanatomy, artificial intelligence, computational theory, philosophy, economics, and anthropology – are all brought to bear on common problems of mind and brain. The success of future research in this challenging area relies on an integrative approach that bridges these more traditional disciplines.

THE FUTURE

There is little doubt that cognitive neuroscience with its emphasis on how the human mind emerges from the human brain will increasingly come to represent the central focus of all of neuroscience as the 21st Century continues to unfold.

Eric R. Kandel, M.D. 2000 Nobel Laureate



THE BRAIN AND MIND INSTITUTE

WORLD RENOWNED RESEARCH FACILITY

THE COMPOSITION OF THE BMI

One of the major reasons the BMI is successful is its interdisciplinary nature. By bringing together researchers from different disciplines to address fundamental questions about brain bases of human nature, the BMI has been able to move beyond typical research silos that characterize a significant portion of university-based research; moreover, the BMI has provided a clear focus for communicating Western's outstanding, and often ground-breaking, research in this field to the wider community – both in Canada and around the world.

The faculties, schools, and institutes at Western currently represented in the BMI include:

- **Arts & Humanities:** Philosophy
- **Education**
- **Engineering:** Electrical and Computer Engineering
- **Health Sciences**: Communication Sciences and Disorders, Kinesiology
- **Ivey Business School**: Marketing
- **Schulich School of Medicine & Dentistry:** Departments of Anatomy & Cell Biology, Clinical Neurological Sciences, Medical Biophysics, Ophthalmology, Physiology & Pharmacology, Psychiatry
- **Science**: Computer Science, Physics & Astronomy
- **Social Science:** Psychology

In addition, we draw a number of our core and associate members from other areas including:

- **Robarts Research Institute**: Centre for Functional and Metabolic Mapping
- **Hospitals** across the city of London
- **Rotman Institute of Philosophy**
- **BrainsCAN Research and Innovation Cores**

WESTERN INTERDISCIPLINARY RESEARCH BUILDING

In January 2018, the Western Interdisciplinary Research Building became the new home for the Brain and Mind Institute, BrainsCAN and the Rotman Institute of Philosophy. Located next to the Visual Arts parking lot off Perth Drive, this 118,000-square-foot facility houses dry laboratories, teaching and research space, classrooms, public amenities and public space.

WHAT WE STUDY

Research at the BMI is focused on cognitive neuroscience – a new interdisciplinary endeavour aimed at understanding how it is that the brain allows us to perceive the world, make sense of what we see and hear, remember the past and plan for the future, communicate our thoughts to others, choose goals, plan actions and carry those actions out. We are also investigating how the brain allows us to interpret not only our own emotions and intentions but those of others as well – in short how it is that the 3 lbs of wetware inside our skulls creates consciousness and allows us to think.

Much of the research in cognitive neuroscience is directed at understanding what goes wrong when our cognitive abilities are compromised by disease, injury, and addiction – in diseases like Parkinson's, Alzheimer's, stroke, and concussion – and why sometimes cognitive abilities fail to develop properly in development disorders such as autism, dyslexia, and ADHD.

Having so many cognitive neuroscientists under one roof helps foster the kind of day-to-day interaction and interchange of ideas that characterizes successful research enterprises. Postdocs, grad students, and the BMI members themselves meet each other in the hallway and lounge – and new research ideas and collaborations grow naturally out of this coffee culture. In addition, by having many of our research facilities in a single location or close by we can share expensive equipment that might otherwise have to be duplicated if we were spread across the campus. This integrative research model has become even more evident in the new Western Interdisciplinary Research Building.

RESEARCH FACILITIES

Researchers at the Brain and Mind Institute have access to laboratories that house specialized and cutting-edge technology.

Magnetic Resonance Imaging (MRI): The Centre for Functional and Metabolic Mapping, which is partnered with the BMI, houses three state-of-the-art brain scanners: a 9.4-Tesla system for studies in small animals, a 7-Tesla system for human and animal research, and a 3-Tesla system that is exclusively for human research. With this equipment, BMI researchers can measure the functional activity and connectivity in the brains of both animals and humans, including newborns.

Transcranial Magnetic Stimulation (TMS): Researchers can investigate the effects of stimulating a local region of the brain in a non-invasive way, and measure how this might affect activity elsewhere in the nervous system or interfere with performance on a specific task.

Measuring Eye and Body Movements: BMI houses sophisticated equipment for tracking eye and limb movements, during activity such as grasping an object, walking, or reading. Researchers can also track eye and hand movements as someone reaches for real objects while in a brain scanner.

Neurobiology of Sleep and Sleep Disorders: The BMI houses a fully-equipped 5-bedroom sleep lab with in-lab 32-channel EEG and polysomnographic systems for recording brain activity and other physiological signals while people are sleeping.

Animal Models of Cognition and Behaviour: Nonhuman primates, mice, rats, and other animals are used as models for the study of complex cognition in humans. Indeed, a number of researchers have parallel programs in humans and animals.

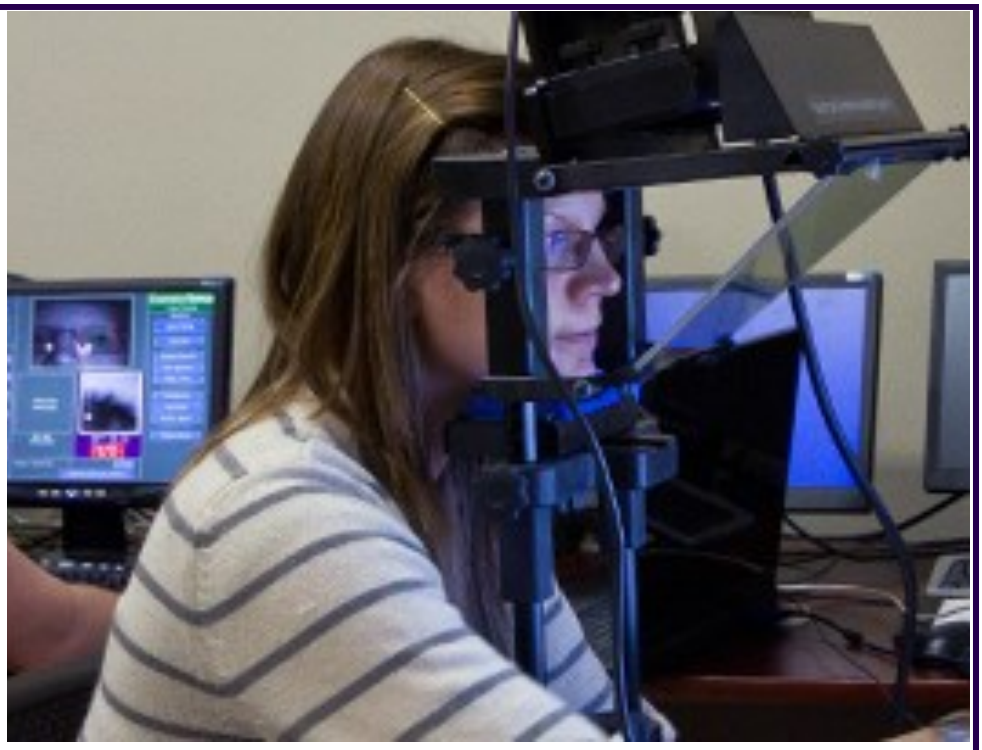
Computing Systems: Brain imaging technologies including EEG and MRI-based techniques yield many terabytes of data each year. The BMI has access to the high performance computing resources that are becoming increasingly necessary to handle these data as well as complex behavioural data.

BMI RESEARCHERS

Advances in cognitive neuroscience require new technology, cross-disciplinary collaboration and innovative methods for measuring the brain and behaviour. Western is home to exceptional researchers who raise the bar for cognitive neuroscience research, including:

- **Physicists**, who develop new brain imaging protocols and equipment;
- **Mathematicians**, who create new analysis methods and computational models of brain function;
- **Cognitive psychologists**, who construct models of the mind and design tasks that isolate particular mental processes;
- **Physicians** – from neurologists to neonatologists – who explore problems most commonly encountered by patients and integrate our growing knowledge of the brain into clinical practice;
- **Philosophers**, who answer new ethical questions and guide help guide the ontology of this new science;
- **Developmental psychologists**, who investigate how the brain grows and what can go wrong during childhood;
- **Cognitive physiologists**, who examine internal mental processes such as memory, perception learning and language; and
- **Computer scientists**, who run complex computer systems and engineers who build laboratory equipment to administer all manner of tasks.

Only by bringing all of these specialities together can the complexities of the brain and mind be better understood.



RESEARCH AND KNOWLEDGE TRANSFER

BMI core members have collectively published more than 4000 peer-reviewed papers during their research careers, with an average of more than 100 papers per investigator. BMI researchers are remarkably collaborative, which has resulted in many papers authored by more than one BMI member. In addition to publishing work in peer-reviewed journals, BMI researchers regularly present their research at leading national and international conferences and are routinely invited to give keynote addresses at such gatherings. All of this ensures BMI research is communicated to others working in this field, including industry and clinical settings.

BMI researchers engage end-users directly. One effective example of this comes from research related to the relationship between brain plasticity and education. BMI researchers who study the neural substrates of arithmetic reasoning and reading, routinely meet with educational practitioners and researchers in Western's Faculty of Education and relevant experts in local school boards to seek advice about particular problems encountered in the schoolroom that can then be investigated in the laboratory. As new findings emerge, researchers meet with curriculum developers in the Ministry of Education and with representatives from companies who design digital tools for education. This interactive cycle, from the classroom to the laboratory and back again, is a highly effective way to enhance evidence-based approaches to education – and ultimately to develop sound educational policy and practice.

Similar approaches are being used to determine how best to teach second languages, critical thinking, and a host of other skills. The interplay between new research in cognitive neuroscience and problems identified by potential end-users is particularly relevant as we move into a digital age where education and workplaces rely increasingly on the Internet, mobile technology, and other digital media tools.

TRAINING OPPORTUNITIES

The BMI is committed to training the next generation of researchers in cognitive neuroscience. It has supported a number of initiatives such as the Postdoctoral Fellowship, the International Graduate Student Scholarship and various exchange programs with other institutes worldwide.

The Western Cognitive Neuroscience Postdoctoral Fellowships program provided up to five annual awards of $25,000 (matched by the supervisor) for each of two years and was created to help attract the best and the brightest young minds to the BMI.

The Western International Graduate Student Scholarship offered research opportunities to international graduate students wishing to be mentored by BMI researchers.

Lastly, BMI has diligently worked on various exchange programs, with universities around the world including Radboud University, the University of Geneva and Monash University.

THE CHALLENGE

"The brain is a monstrous, beautiful mess. Its billions of nerve cells - called neurons - lie in a tangled web that displays cognitive powers far exceeding any of the silicon machines we have built to mimic it."

William F. Allman *Apprentices of Wonder. Inside the Neural Network Revolution*, 1989 .

MENTORING AND EDUCATION

Collectively, BMI researchers supervise more than 165 graduate students and 50 postdoctoral fellows, most of whom hold competitive salary awards, including Vanier Canada Graduate Scholarships and Banting Postdoctoral Fellowships awarded to Western. We have attracted talented graduate students and postdoctoral fellows from leading labs around the world, with backgrounds ranging from cognitive psychology to engineering. Part of the reason we have been successful is that we can provide trainees with access to state-of-the-art facilities for research in cognitive neuroscience, including imaging facilities that rank amongst the very best in the world. In addition to attracting young graduates from institutions across Canada, BMI researchers have recruited top talent from the United States, Australia, Israel, Spain, Albania, the UK, Italy, China, Japan, Taiwan, Lebanon, the Netherlands, and Germany. Our trainees routinely secure positions in leading universities across the globe.

As importantly, we have retained some of the best and the brightest of our trainees from overseas in Canada. Although the BMI is involved in supervision of graduate students across campus, the institute is not formally involved in undergraduate or graduate instruction. Nevertheless, we work closely with the Graduate Program in Neuroscience and other relevant graduate programs to develop new directions for graduate education geared towards trainees in cognitive neuroscience. The institute also works closely with departments across campus to ensure honors students have opportunities to do research at the BMI for their honors thesis. Many of these honors students and undergraduate student volunteers work closely with graduate students and postdoctoral fellows in the BMI.

INTERNATIONAL RESEARCH

International collaborations are key to taking research to the next level. Both collectively and individually, researchers at the BMI have well-established collaborations with researchers in many countries around the world, including the UK, China, Brazil, Australia, Kenya, and many countries in the EU. We have exchange programs with the Monash Institute for Cognitive and Clinical Neuroscience in Australia, the Donders Institute for Brain, Cognition, and Behaviour in the Netherlands, and the Cognitive Neuroscience Group at the University of Geneva.

The BMI regularly welcomes researchers and trainees from around the world and has sponsored several international scientific meetings at Western and elsewhere in Canada.

PARTNERSHIPS AND RESEARCH COLLABORATIONS

The BMI also has excellent relationships with industry partners, including IBM Canada, CISCO, Siemens Canada, and Northern Digital Inc. BMI researchers are developing new approaches to brain analyses, human-machine interfaces, visualization graphics, and other projects that are of significant interest to these companies, and others in the private sector. Indeed, it is worth emphasizing that the range of possible partners who have a stake in issues central to research at the BMI is very large. These include computer hardware and software companies, the entertainment industry, military, professional sports, automakers interested in development of intelligent and self-driving cars, hotel chains (for whom sleep is an important commodity), companies making medical equipment, and manufacturers of video games and educational software.

WORKING TOGETHER

"Science is a field which grows continuously with ever expanding frontiers. Further, it is truly international in scope. … Science is a collaborative effort. The combined results of several people working together is often much more effective than could be that of an individual scientist working alone."

John Bardeen 1956 /1972 Nobel Laureate

INTERNATIONAL RELATIONSHIPS

The BMI knows that advances in cognitive neuroscience can be accomplished only with strong international relationships and interactions. For this reason, the BMI established an International Scientific Advisory Board to provide an arms-length review of the BMI's progress both in research and training and in establishing productive international collaborations.

INTERNATIONAL SCIENTIFIC ADVISORY BOARD

The BMI established an International Scientific Advisory Board (ISAB), comprising some of the leading researchers in the field, to guide the institute in charting future directions for the development of cognitive neuroscience at Western. The following individuals have agreed to serve on this board and met for the first time on September 21, 2015, in concert with our BMI Fall Symposium that was held September 20, 2015. An external review of the institute was executed by the ISAB and a report was submitted to the University. This report emphasized the exceptional interdisciplinary collaborations in cognitive neuroscience and offered recommendations for the BMI moving forward.

David Burr, PhD
CNR Institute of Neuroscience, Pisa
Department of Psychology
University of Florence Stella Maris Foundation, Pisa, Italy

Alfonso Caramazza, PhD
Daniel and Amy Starch Professor of Psychology, Department of Psychology
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Jeffrey Schall, PhD
E. Bronson Ingram Professor of Neuroscience
Professor of Ophthalmology and Visual Sciences
Director of Center for Integrative Cognition & Cognitive Neuroscience
Vanderbilt University, Nashville, TN 37235, USA

Irene Tracey, PhD
Nuffield Professor of Anaesthetic Science
Director of the Oxford Centre for fMRI
University of Oxford, United Kingdom

BMI CORE MEMBERS

LEADING RESEARCHERS IN COGNITIVE NEUROSCIENCE

Faculty members from Western University who are actively engaged in cognitive neuroscience, whether basic or applied, are considered for core membership at the Brain and Mind Institute. Currently, there are 45 core faculty members from various disciplines across campus, leading research activities at the Institute as Principal Investigators. The research activities they oversee are providing a better understanding of the neural bases of a range of mental abilities and deficits. BMI's Core Members and their teams study areas related to music, cognitive development, perception, emotions — and the list goes on.

For more information on the terms of reference for BMI members and how to apply for membership at the Brain and Mind Institute, please visit the BMI website at www.uwo.ca/bmi.

MICHAEL ANDERSON

Lab: Anderson Lab

Dr. Michael Anderson is a professor and Chair in Philosophy in Science at the Rotman Institute of Philosophy. His research is located at the intersection of psychology, neuroscience, computer science, and the philosophy of cognitive science. His recent work outlines a novel framework for understanding the overall functional organization of the brain, places its function in evolutionary context, and demonstrates how mechanisms originally evolved for the support of sensory-motor coordination have been coopted to facilitate language and mathematics.

DANIEL ANSARI

Lab: Numerical Cognition Laboratory

Dr. Daniel Ansari is a Professor and Canada Research Chair in Developmental Cognitive Neuroscience in the Department of Psychology and the Brain and Mind Institute at the University of Western Ontario in London, Ontario, where he heads the Numerical Cognition Laboratory (www.numericalcognition.org). Daniel and his team explore the developmental trajectory underlying both the typical and atypical development of numerical and mathematical skills, using both behavioral and neuroimaging methods. He has a keen interest in exploring connections between cognitive psychology, neuroscience and education and served as the President of the International Mind, Brain and Education Society (IMBES) from 2014-16.

ROBERT BARTHA

Lab: Bartha Group

Dr. Robert Bartha is the Bank of Montreal Chair in Neuroimaging and a Professor of Medical Biophysics and a Robarts Research Institute Scientist. Robert's expertise includes high and ultra-high field MRI and MRS methods development in patient populations and in animal models, working at 4T since 1996, 7T since 1999 and 9.4T since 2005. He has an extensive background in short-echo time MR spectroscopy acquisition and quantification and volumetric imaging acquisition and analysis. He has publications and grants with various team members in the areas of Alzheimer's disease, MCI, dementia and epilepsy.

LAURA BATTERINK

Lab: Batterink Lab

Dr. Laura Batterink is an Assistant Professor in Psychology. Laura's lab studies many different aspects of human learning, with a particular focus on how implicit and explicit memory mechanisms contribute to language acquisition.

TIM BUSSEY
Lab: TCNLab

Dr. Tim Bussey is a Professor in Physiology and Pharmacology with a joint appointment in Psychiatry.
He also is a Western Research Chair under the Western Cluster of Research Excellence in Cognitive Neuroscience. His research in cognition, with Dr. Lisa Saksida, has him asking questions on how the healthy brain does it, what goes wrong in neurodegenerative and neuropsychiatric disease, and identifying targets for therapy. Tim also works on improving preclinical-to-clinical translation.

BLAKE BUTLER
Lab: Neuroplasticity in Sensory Systems Lab

Dr. Blake Butler is an Assistant Professor in Psychology. Blake's research focuses on the role of experience & plasticity in the development of sensory systems, with a focus on hearing loss and restoration. His program combines behavioural, neuroimaging, and anatomical approaches across models.

BLAINE CHRONIK
Lab: Chronik Group

Dr. Blaine Chronik holds an NSERC Industrial Research Chair and heads the Western MR Systems Development Lab and a Professor in Physics. His team investigates mathematical transformation algorithms for detection and correction of phase artefact in MRI, non-image-encoding local gradient coils, and MRI System Development. Current projects include work in the areas of field-cycled MRI (fcMRI), specialized gradient coil inserts, peripheral nerve stimulation in the MR environment, and eddy current modeling.

BRIAN CORNEIL
Lab: Gaze Control Lab

Dr. Brian Corneil is a Professor in Physiology and Pharmacology with a joint appointment in Psychology. His team seeks to understand how the brain controls movement. To understand such transformations, eye-head gaze shifts which rapidly change our line of sight are examined. In his lab, they combine neurophysiological and behavioural techniques in both humans and animal models.

JODY CULHAM
Lab: Culham Lab

Dr. Jody Culham is a Professor in the Psychology department and Neuroscience graduate program. Her lab uses neuroimaging (fMRI) and behavioral approaches to investigate how the human brain uses sensory information to perceive the world and guide hand actions such as reaching, grasping and tool use. Jody was one of the first to use brain imaging techniques to discover and characterize human brain areas involved in hand actions. Her approach emphasizes using real-world stimuli (such as real objects instead of pictures) and real actions to better understand brain function under natural conditions, sometimes in contrast to artificial and virtual conditions.

MARK DALEY

Lab: Daley Lab

Dr. Mark Daley is Western's Associate Vice President, Research and an Associate Professor in Computer Science, Biology, and Statistics & Actuarial Science. He is also the SHARCNET Research Chair in Biocomputing and the Chairman of the board of directors for Compute Ontario. Mark specializes in natural computing, computational and mathematical modelling of biological systems, theoretical computer science, high performance computing for biology and mathematics, molecular evolution and algorithmics of music and the visual arts.

JÖRN DIEDRICHSEN

Lab: Motor Control Group

Dr. Jörn Diedrichsen is a Western Research Chair under the Western Cluster of Research Excellence in Cognitive Neuroscience and a Professor in Computer Science. In his motor control group, robotic devices are used to investigate human motor behavior to study how the brain recalibrates well-learned motor skills or acquires new ones. Computational models are then developed to understand the underlying control and learning processes. These insights are used to design fMRI studies to investigate how these processes map onto the brain.

EMMA DUERDEN

Lab: Developing Brain Lab

Dr. Emma Duerden is an Assistant Professor in Education. Emma's research program focuses on the impact of early adversity on cognitive ability in infants and school-aged children with autism spectrum disorder or who are born very preterm. The goal of Emma's research program is to identify risk factors for early adversity as well as factors that promote resilience to early life stress, healthy brain development and academic achievement in children.

ROY EAGLESON

Lab: Eagleson Research Group

Dr. Roy Eagleson is a Professor in Electrical and Computer Engineering, an Associate Scientist at the Robarts Research Institute, and a Scientist and Principal Investigator at CSTAR (The Canadian Surgical Technologies and Advanced Robotics research centre; part of the London Health Sciences Centre (LHSC), LHRI. Roy studies 3D Biomedical Visualization and Surgical Simulation, Human-Computer Interface Design for Surgical Skills Training, and Haptic Interfaces and Interactive Immersive Graphical Interfaces (Volumetric Visualization with GPU programming).

STEFAN EVERLING

Lab: Laboratory for Neural Circuits & Cognitive Control

Dr. Stefan Everling is a Professor in Physiology and Pharmacology with a joint appointment in Psychology. Stefan's research aims to understand how frontal brain areas influence cognitive functions in the primate brain. By better understanding which areas underlie which cognitive functions, he works towards identifying the brain areas that can serve as targets for future treatment of prefrontal strokes and trauma.

MELVYN GOODALE

Lab: Goodale Lab

Dr. Mel Goodale is the founding Director of the Brain and Mind Institute, the Canada Research Chair in Visual NeuroScience and a Professor in Physiology and Pharmacology with a joint appointment in Psychology. Mel is best known for his work on the functional organization of the visual pathways in the cerebral cortex, and was a pioneer in the study of visuomotor control in neurological patients. His recent research uses functional magnetic resonance imaging (fMRI) to look at the activity in the normal human brain as it performs different kinds of visual tasks. He has also developed virtual-object

JESSICA GRAHN

Lab: Music and Neuroscience Lab

Dr. Jessica Grahn is an Associate Professor in the Department of Psychology and has established herself as an emerging leader in the field of the neuroscience of music which combines her unique background as a classically trained concert pianist and her training as a neuroscientist. Jessica conducts brain scanning studies examining how different motor areas in the brain respond to musical rhythm. She is also interested in how rhythm and music may be processed in the brains of those who have dysfunction in the brain areas that control movement, as happens in Parkinson's disease.

PAUL GRIBBLE

Lab: Human Sensory Motor Neuroplasticity and Motor Learning

Dr. Paul Gribble is a Professor in Psychology and holds a joint appointment in Physiology and Pharmacology . Paul's research focuses on how the brain controls voluntary movement, and the relationship between neuroplasticity in sensory and motor brain areas and motor skill learning. Despite the significant mechanical complexities of multi-joint limb movement, humans are able to interact with the environment with remarkable ease. Research in the Gribble Lab is focused on understanding how the brain is organized to support motor learning, and how the central nervous system interacts with the complex peripheral neuromuscular plant to control skilled movement.

ELIZABETH HAYDEN

Lab: Personality and Emotion

Dr. Elizabeth Hayden is a Professor in the clinical area of Psychology. Her current research looks at characterizing the mechanisms by which temperament confers risk for mood disturbances, taking a perspective informed by developmental processes.

DEBRA JARED

Lab: Cognitive, Developmental and Brain Sciences

Dr. Debra Jared a Professor in the department of Psychology in the Cognitive, Developmental and Brain Sciences area and a member of the Language and Concepts Research Group in that area. Her research program aims to understand the cognitive processes involved in reading. Her research on bilinguals investigates how their reading in one language is influenced by their knowledge of their other language as well the culture associated with that language. The research uses behavioural, eye tracking and electrophysiological methodology. Much of her research has studied bilinguals who know English and French, but more recently, thanks to the language expertise of her students, the research has been extended to bilinguals whose language in addition to English is Russian, Japanese, Chinese, Spanish, Italian, Korean, or Malay.

MARC JOANISSE

Lab: LRCN Lab

Dr. Marc Joanisse is a Professor in Psychology and the Neuroscience graduate program. He also holds an appointment as an Affiliated Scientist at Haskins Laboratories in New Haven Connecticut. In the Language, Reading and Cognitive Neuroscience Lab, Marc's research examines the neural underpinnings of first- and second-language learning in children and adults, with a special focus on the interplay between spoken and written language. This includes studying the brain bases of reading ability and disability across the lifespan, using a wide variety of experimental techniques including fMRI, ERP and eye-tracking.

INGRID JOHNSRUDE

Lab: CoNCH Lab

Dr. Ingrid Johnsrude is the BMI Director and a Western Research Chair under the Western Cluster of Research Excellence and holds joint Professor appointments in Psychology, and in the School of Communication Sciences and Disorders. In Ingrid's Cognitive Neuroscience of Communication and Hearing (CoNCH) lab, psychophysical and neuroimaging methods such as fMRI and EEG are used to study the neural basis of hearing; particularly how the brains of listeners transform the noisy and variable sounds of everyday conversations into meaningful language. The ultimate goal of this work is to make speech listening easier for people with hearing impairment. The group is also exploring novel functional-imaging based methods for evaluation of subtle brain abnormalities in epilepsy, concussion and other brain disorders.

ALI KHAN

Lab: Khan Computational Imaging Lab

Dr. Ali Khan is a an Assistant Professor and scientist at the Robarts Research Institute. Ali and his lab group focus on the development of computational methods to enhance medical imaging processes, particularly those related to determining the role of the hippocampus in epilepsy. His group develops and applies sophisticated image processing and analysis techniques to extract, quantify, and distill information from medical images, ultimately leading to more accurate diagnoses and more precise surgical interventions. Ali's multi-disciplinary research spans across several domains, with applications in epilepsy, cancer, cardiovascular disease, and neuroscience.

STEFAN KÖHLER

Lab: Köhler Memory Lab

Dr. Stefan Köhler is a Professor in Psychology. The research in his Memory Lab in Cognitive Neuroscience focuses on the functional and neuroanatomical organization of memory in the human brain. Questions addressed by his lab include how memory systems interact with the visual system and with knowledge representation, whether different parts of the brain support memory for different types of information, and how visceral feedback from the peripheral nervous system shapes memory experiences.

STEPHEN LOMBER

Lab: Cerebral Systems Lab

Dr. Stephen Lomber is a Canada Research Chair (Tier I) in Brain Plasticity and Development, and a Professor in Psychology, Physiology and Pharmacology. In addition, Steve holds an appointment as a principal investigator in the National Centre for Audiology in the Faculty of Health Sciences. Steve's lab uses an integrated approach of psychophysics, electrophysiological recording, neuro-anatomical techniques, and functional imaging to examine processing in auditory cortex. Work in the lab examines cortical plasticity in the presence and absence of acoustic input, and following the initiation of auditory processing through the means of cochlear prosthetics.

PENNY MACDONALD

Lab: MacDonald Lab

Dr. Penny MacDonald is a Canada Research Chair (Tier II) in Cognitive Neuroscience and Neuroimaging, as well as a Movement Disorders Neurologist and an Assistant Professor in Clinical Neurological Sciences. She is cross-appointed in Physiology and Pharmacology, and Psychology. Penny's research aims to understand the nature and causes of *cognitive* deficits such as learning, memory, and thinking problems that are increasingly recognized in more than 50% of Parkinson's disease patients. Deficits in cognition disproportionately cause a decline in quality of life for patients with PD, and are a frequent cause of institutionalization. Clarifying these deficits and the changes in brain function that underlie them is therefore critical.

SCOTT MACDOUGALL-SHACKLETON

Lab: AFAR

Dr. Scott MacDougall-Shackleton is the Department Chair of Psychology and a Professor in Psychology. Research in Scott's lab is broadly integrative. His team combines field and laboratory studies, and research ranges from population-level studies to individual behaviour to molecular biology. Their main goal is to understand how the mechanisms of behaviour have been shaped by natural selection. Scott's team focuses on songbirds because of their phenotypic diversity, behavioural complexity and well-studied physiology and neurobiology.

JULIO MARTINEZ-TRUJILLO

Lab: Cognitive Neurophysiology Laboratory

Dr. Julio Martinez-Trujillo is appointed to the position of Provincial Endowed Academic Chair in Autism, Schulich School of Medicine & Dentistry and is a Professor in Psychology and the Neuroscience graduate program. Julio's research aims to understand the mechanisms of cognition and behaviour in the normal brain and during disease, focusing on how the brain transforms visual signals into coordinated behaviour and how this process is influenced by cognitive functions, such as attention and memory.

KEN MCRAE

Lab: McRae Lab

Dr. Ken McRae is the Associate Dean Research in the Faculty of Social Science and a Professor in Psychology. His research is focused on how people represent, understand, and use abstract concepts. Ken is investigating how such concepts are processed in the mind and brain. His most recent research approaches abstract concepts from the perspective that the real-life situations in which people experience these concepts are central to their representation and processing.

RAVI MENON

Lab: Menon Group

Dr. Ravi Menon is the Director of the Centre for Functional and Metabolic Mapping (CFMM), a Professor in Medical Biophysics, Medical Imaging, Neuroscience, and Psychiatry, Scientific Director for BrainsCAN, and holds an appointment as the Canada Research Chair in Functional and Molecular Imaging. Ravi's research centres around the application of ultra-high field MRI to problems in neuroscience. Towards this end, his group is developing new radio frequency coil hardware to improve the homogeneity of the images in conjunction with software techniques to speed up the image acquisition. Utilizing these advancements, his team are studying the biophysical basis of the functional MRI signal which is used in all modern day cognitive and clinical neuroscience as well as developing MRI methods such as quantitative susceptibility mapping for use in the early diagnosis and monitoring of multiple sclerosis.

PAUL MINDA

Lab: The Categorization Lab

Dr. John Paul Minda is an Associate Professor in Psychology. His innovative research works to answer questions about how and why humans organize information into categories and concepts and how the resulting conceptual structure influences thinking and behaviour. This work extends into research on expert performance, complex learning, and understanding the neuro-cognitive effects of mindfulness meditation practice.

DEREK MITCHELL

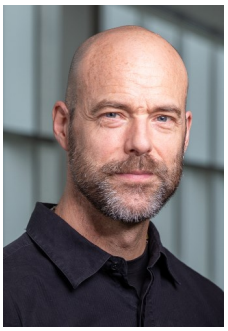
Lab: Emotional Cognition Lab

Dr. Derek Mitchell is an Associate Professor in Psychiatry, Anatomy and Cell Biology, and Psychology. One line of Derek's research focuses on how impairments in the way the brain processes emotions of others may be associated with antisocial behaviours such as aggression. Other researchers found that directing attention to critical social cues alleviates the emotional expression recognition deficits often found in populations of individuals with high levels of antisocial behaviour. It remained unclear, however, whether this improvement in recognition is accompanied by elevated feelings of empathy (likely a more important determinant of rehabilitation and prosocial behaviours).

YALDA MOHSENZADEH

Lab: Cognitive Neuroscience & Artificial Intelligence Lab

Dr. Yalda Mohsenzadeh is an Assistant Professor of Computer Science and a faculty affiliate with Vector Institute for Artificial Intelligence. Her lab works at the intersection of cognitive neuroscience and computer science closing the loop between theory and experiment. Computational principles guide our experiments into the underlying brain function, and through neuroscientific insights, we aim to develop "cognitive machines"—biologically inspired computational models that can recognize and interact with the world like humans. The lab uses deep convolutional neural networks, neuroimaging experiments (fMRI and MEG/EEG) and advanced analytical tools for mapping the spatiotemporal dynamics of neural processing during visual behavior.



J. BRUCE MORTON

Lab: Cognitive Development and Neuroimaging Laboratory

Dr. Bruce Morton serves as an Associate Professor in Psychology and is a faculty member of the graduate programme in Neuroscience. Bruce's research interests concern the development of cognitive control and its association with changes in prefrontal cortex function. One of the foremost challenges for young children is organizing their thoughts and actions in the service of achieving long-term goals. Children find it difficult to defer small immediate rewards in favor of larger future rewards for example, or to switch the focus of their attention from one feature of a stimulus to another. The development of such self-regulatory capacities is an important foundation for later academic, social, and health-related outcomes, and is therefore the focus of many basic and applied research programs.

LYLE MULLER

Lab: Muller Lab

Dr. Lyle Muller is an Assistant Professor of Applied Mathematics and a member of the international collaborative research network NeuroNex, contributing to an ongoing research project on mental representation and working memory. His research centers on developing new approaches to analyze and model large-scale recordings of neural population dynamics in cortex. In a ground-breaking collaboration with BrainsCAN, Muller and his colleagues have been given unprecedented access to study the human brain at the individual cell level while patients are conscious.

MARIEKE MUR

Lab: Mur Lab

Dr. Marieke Mur is an Assistant Professor in the Departments of Psychology and Computer Science. Her research brings together psychology, neuroscience, and artificial intelligence to understand how the human brain supports perception and cognition. Work in the lab focuses on how the brain interprets and flexibly responds to the outside visual world. The lab addresses these questions using psychophysics, neuroimaging, and computational modelling.

ADRIAN OWEN

Lab: Owen Lab

Dr. Adrian Owen is a Professor in Psychology, Anatomy and Cell Biology, Physiology and Pharmacology and previously the Canada Excellence Research Chair in Cognitive Neuroscience and Imaging. His research combines neuroimaging (MRI and EEG), with cognitive studies in brain-injured patients and healthy participants. His team studies patients who have sustained brain injuries that result in disorders of consciousness. They also study patients with neurodegenerative diseases in order to understand more about the causes and consequences of the memory, perception and reasoning problems that many of them experience. Finally, they develop web-based tools for the assessment of cognitive function, both in healthy participants and in patients with disorders of the brain.

LENA PALANIYAPPAN

Lab: Neuroimaging in Mental Illness

Dr. Lena Palaniyappan works with patients and families experiencing psychosis and depression. He is the Tanna Schulich Chair in Neuroscience and Mental Health at Western University; Director of the Neuropsychiatry program at Schulich School of Medicine & Dentistry; Scientific Director of the Prevention and Early Intervention in Psychoses Programme (PEPP), London Health Sciences Centre, and he leads the Neuroimaging in Mental Illnesses (NIMI) research group based at the Robarts Research Institute. The major emphasis of his research is to modify the pathways that lead to poor long-term outcome in individuals with serious mental disorders that often start in adolescence. His research team has an imaging base at Robarts Research Institute; a clinical base at Victoria Hospital, London Health Sciences Centre and a Neuromodulation base at the Parkwood Institute's Brain Stimulation Clinic.

ANDREW PRUSZYNSKI

Lab: Pruszynski Lab

As Canada Research Chair (Tier II) in Sensorimotor Neuroscience and an Assistant Professor in Physiology and Pharmacology and Psychology, Dr. Andrew Pruszynski studies the neural mechanisms of reaching, grasping and object manipulation. By learning how various parts of the nervous system work together when generating skilled movement of the arm and hand, Andrew's team strive to find better treatments for recovering hand and arm function following peripheral nerve injury, spinal cord injury, and stroke.

LISA SAKSIDA

Lab: TCNLab

Dr. Lisa Saksida is a Professor in Physiology and Pharmacology with a joint appointment in Psychology. She is also the Scientific Director for BrainsCAN. Her research in cognition, with Dr. Tim Bussey, has her asking questions on how the healthy brain carries out cognitive operations, what goes wrong in neurodegenerative and neuropsychiatric disease, and identifying targets for therapy. Lisa also works on improving preclinical-to-clinical translation.

SUSANNE SCHMID

Lab: The Schmid Lab

Dr. Susanne Schmid is an Associate Professor in Anatomy and Cell Biology, and the Associate Dean for Graduate and Postdoctoral Studies. Susanne and her lab study mechanisms underlying normal sensory filtering and sensory filtering disruptions in animal models of schizophrenia and autism. Two operational measures are used for sensory filtering in order to study the underlying mechanisms: habituation and prepulse inhibition of startle.

DAVID SHERRY

Lab: AFAR

Dr. David Sherry is a Professor in Psychology. His research focuses on evolution and neurobiology of memory and spatial orientation. David works with food-storing black-capped chickadees and brood-parasitic brown-headed cowbirds examines spatial memory and the functional neuroanatomy of the avian hippocampus. By examining the brain and behaviour of birds, one can observe how evolutionary change in memory and other cognitive functions occurs, and observe the relation between evolutionary change in behaviour and evolutionary change in the brain.

ANDREA SODDU

Lab: Soddu Lab

Dr. Andrea Soddu is an Assistant Professor in Physics, where he investigates spontaneous brain activity using fMRI, global metabolism and structural connectivity using diffusion tensor imaging in patients with disorders of consciousness, hypnosis, anesthesia, tinnitus and dementia.

RYAN STEVENSON

Lab: Stevenson Lab

Dr. Ryan Stevenson was recently hired as an Assistant Professor in Psychology. His lab's research focuses on how visual and auditory perception influence high-order cognitive processing, whether in the autism spectrum or in cochlear implant users.

BRIAN TIMNEY

Lab: Timney Lab

Dr. Brian Timney is a Professor Emeritus in Psychology and recently oversaw the Faculty of Social Science as Dean. There are three areas of research conducted in his lab:

1. The effect of alcohol on vision,
2. The temporal characteristics of human binocular vision, and
3. Comparative studies of vision in horses and camels.

TUTIS VILIS

Lab: Vilis Lab

As Professor Emeritus, Dr. Tutis Vilis explores the function of two important cortical areas—the ventral stream, which specializes in the perception of visual objects and the dorsal stream, which specializes in directing motor actions. He has been a pioneer in the development of on-line teaching modules in physiology and neuroscience.

For more information on the BMI Core Members, including contact information, please visit:
https://www.uwo.ca/bmi/investigators/index.html.

BMI ASSOCIATE MEMBERS

The BMI also engages with other members of the Western community, including research scientists and Principal Investigators in clinical departments. For more information on current associate members, visit https://www.uwo.ca/bmi/investigators/index.html.

Brian Allman	Anatomy & Cell Biology
Udunna Anazodo	Medical Biophysics
Lisa Archibald	Communication Sciences and Disorders
Corey Baron	Medical Biophysics
Lindsay Bodell	Psychology
Janis Cardy	Communication Sciences and Disorders, National Centre for Audiology
Sandrine de Ribaupierre	Clinical Neurological Sciences
Jonathan De Souza	Music
Derek Debicki	Clinical Neurological Sciences
Neil Duggal	Clinical Neurological Sciences
Barbara Fenesi	Education
Elizabeth Finger	Clinical Neurological Sciences
Alexander Fraser	Clinical Neurological Sciences, Ophthalmology
Deanne Friesen	Education
Teneille Gofton	Clinical Neurological Sciences
Elizabeth Hampson	Psychology
Matthew Heath	Kinesiology
Erin Heerey	Psychology
Justin Hicks	Medical Biophysics
Wataru Inoue	Physiology & Pharmacology
Kevin Johnston	Psychology, Physiology & Pharmacology
Erin Kaufman	Psychology
Rishi Lalgudi Ganesan	Paediatrics Critical Care
Beth MacDougall-Shackleton	Biology
Haojie Mao	MME and Biomedical Engineering
Angela Mendelovici	Rotman Institute of Philosophy
Natasha Mhatre	Biology
Amanda Moehring	Biology
Lindsay Nagamatsu	Kinesiology
Rajni Patel	Biomedical Electrical & Computer, Engineering, Clinical Neurological Sciences, Surgery
Terry Peters	Medical Imaging, Medical Biophysics, Biomedical Engineering
Marco Prado	Physiology and Pharmacology, Anatomy and Cell Biology
Vania Prado	Physiology and Pharmacology, Anatomy and Cell Biology
David Purcell	Communication Sciences & Disorders
Yasaman Rafat	Modern Languages and Cultures
Marie Y. Savundranayagam	School of Health Sciences
Taylor Schmitz	Physiology & Pharmacology
Kevin Shoemaker	Kinesiology, Physiology & Pharmacology
Anne F. Simon	Biology
Marat Slessarev	Medicine
Rob Stainton	Rotman Institute of Philosophy
Bobby Stojanoski	Psychology
Ana Suller Marti	Clinical Neurological Sciences
Jackie Sullivan	Rotman Institute of Philosophy
Jennifer Sutton	Psychology, Brescia University College
Robert Teasell	Physical Medicine and Rehabilitation, Parkwood Institute Research
Jonathan Thiessen	Medical Biophysics, Medical Imaging
Chris Viger	Rotman Institute of Philosophy
Boyu Wang	Computer Science
Charles Weijer	Rotman Institute of Philosophy

ADMINISTRATIVE AND TECHNICAL CORE

Florence Lourdes	Administrative Officer
Denise Soanes	Secretary and Receptionist
Haitao Yang	Systems Manager and Software Engineer

BMI HIGHLIGHTS THIS YEAR

SHOWCASING OUR INDUSTRIOUS RESEARCHERS AND THE CUTTING-EDGE RESEARCH TAKING PLACE AT WESTERN UNIVERSITY

The Brain and Mind Institute received a new audio dome in the Western Interdisciplinary Research Building to better understand how people hear in the real world. The geodesic dome, speakers and assorted other equipment was newly installed by Austrian firm sonible.com and its $700,000 cost is supported through investments from the Canadian Foundation for Innovation (CFI) and the Ontario Research Fund (ORF).

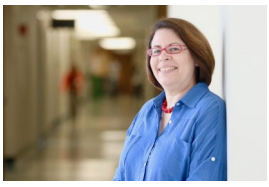
Postdoctoral scholar, Amy Reichelt, is exploring how unhealthy diets impact the developing brain and why young people today are so prone to developing obesity. Amy's research centers on how modern day 'obesogenic,' or obesity-promoting, diets change the brain. Amy aims to understand how what we eat alters our behaviour and whether brain changes can be mitigated by other lifestyle factors.

Dr. Blake Richards from The Learning in Neural Circuits Lab at McGill University joined The Western Integrative Neuroscience Talk Series (TWINtalks) to speak to the Neuroscience community about burst-timing-dependent synaptic plasticity can coordinate learning in hierarchical circuits. Blake follows two previous talks by Dr. Nikolaus Kriegeskorte, in Psychology and Neuroscience at Columbia's Zuckerman Institute and Dr. Timothy Verstynen in Psychology and Bioengineering at CMNI.

BMI researcher Emma Duerden from the faculty of Education found an enlarged part of the brain – the amygdala – has indicated higher incidents of anxiety and depression in children with neurodevelopmental disorders. The discovery of a biomarker in the brains of those with neurodevelopmental disorders – such as autism, attention deficit hyperactive disorder (ADHD) or obsessive compulsive disorder (OCD) – may offer hope to families looking for clues in how to address anxiety and depression in their children.

DONDERS INSTITUTE

BMI-DI Exchange program awarded three BMI members: Susan Coltman (PhD candidate), with her project *Are Fast and Slow Learning Processes Independently Malleable?;* and Aysha Motala and Vanessa C. Irsik (Postdoctoral Associates) together on the project *Examining pre-stimulus neural templates and facilitative and contrastive context effects.*



Psychiatry professor Dr. Ruth Lanius was recently honoured for her work with the Banting Award for Military Health Research, presented annually by the Canadian Institute for Military and Veteran Health Research (CIMVHR) Forum to a researcher addressing military health issues. Lanius works with military personnel as well as first responders and civilians looking to move past their symptoms of post-traumatic stress disorder (PTSD) and will soon expand the research to include the experiences of Indigenous People.

Dr. Lena Palaniyappan, along with an international team of researchers, are seeking to provide relief for millions around the globe by pairing brain stimulation with artificial intelligence and big data to uncover the role of genetics in successfully treating mental illness. This new study uses artificial intelligence to determine if patients with major depression and schizophrenia will respond positively or negatively to a four-week brain stimulation program. The international team's goal is to treat 60,000 qualified participants worldwide by 2022.

The Brain and Mind Institute is a proud contributor to Western University being one of the fastest rising institutions for scientific research across the globe. Western University secured private and public partnerships, particularly in areas of research with higher equipment and infrastructure costs. Overall, it has invested more than Cdn$400 million (US$302 million) in infrastructure, including biomedical imaging and high-performance computing facilities at the Brain and Mind Institute.

BMI researcher and co-scientific director of BrainsCAN, Ravi Menon, was named one of the new Fellows of the Royal Society of Canada (RSC). Ravi has been a pioneer in the use of MRI for structural and functional brain imaging. From the landmark demonstration and further development of functional MRI, to pioneering the use of ultra-high field MRI techniques for use in neuroscience and patient care, the ground-breaking neuroscience and neuroimaging advances developed by Menon are used in thousands of universities, research institutes, hospitals and pharma around the world today.

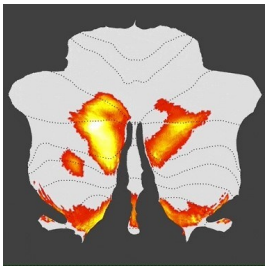
Mark Daley was named Special Advisor to the President on Data Strategy with a mandate to help the institution make sense of, and make a difference in, a data-driven world. This new role will lead the creation of an institutional data strategy "to empower its students, faculty and staff with the data acumen they need to become 21st-century citizens." This strategy will guide Western in the development of new training programs, new means of enabling and supporting data-fueled research, and new tools for leveraging the institution's data reserves.

Lefties and righties may put pen to paper from different sides of the page, but when it comes to numbers, everything adds up using the same point in the brain, according to a recent Western study. For their study supported by BrainsCAN, BMI researchers Celia Goffin, Moriah Sokolowski, Michael Slipenkyj and Daniel Ansari compared the brain activity of both left-handed and right-handed participants during a task involving numbers. With only 10 per cent of the world's population identified as left-handed, previous studies typically relied on right-handed participants to learn how the brain processes numbers. For this study, however, researchers focused on left-handers to determine if they learned to use a different area of their brain to process numbers.

INNOVATION.CA
CANADA FOUNDATION FOR INNOVATION | FONDATION CANADIENNE POUR L'INNOVATION

From hearing loss and brain activity, to cancer and joints, to sustainable energy and social cues, six Western-led projects, involving 10 researchers within four faculties, received more than $1 million through the CFI John R. Evans Leaders Fund, including BMI scientists Blake Butler, Psychology; Jörn Diedrichsen, Computer Science; Marc Joanisse, Psychology; and Ingrid Johnsrude, Psychology.

The fear predators inspire in their prey can leave long-lasting traces in the brains of wild animals, comparable to effects seen in humans dealing with post-traumatic stress disorder (PTSD), according to a Western-led study. Led by Biology professor Liana Zanette, Psychology professor Scott MacDougall-Shackleton and Biology professor Michael Clinchy, the study, *Predator-induced fear causes PTSD-like changes in the brains and behaviour of wild animals*, was published today in Scientific Reports–Nature.



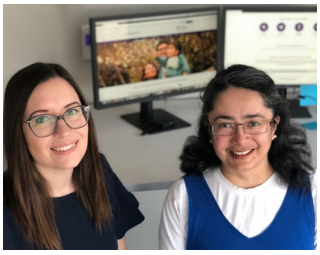
Lead author Maedbh King, MSc'17 (Neuroscience), created the map as a Western student in collaboration with Jörn Diedrichsen, Western Research Chair for Motor Control & Computational Neuroscience, and Richard Ivry, University of California, Berkeley, Professor of Psychology and Neuroscience, with support from Western's BrainsCAN. The detailed map shows the functional correlates of each cerebellar region in never-before-seen detail. If you think about disease development, it's likely that only a few subregions within the cerebellum, might be disrupted in a specific disease, so researchers need a better idea of where exactly to look," Diedrichsen, a core member in Western's Brain and Mind Institute (BMI) and senior author of the study.

Delivering proper care to thousands living with dementia means personal-support workers must understand more than patients' medical histories – they need to know the people behind them. This patient-caregiver relationship is bolstered through what Savundranayagam calls Be EPIC, a training program to provide personal-support workers with the skills necessary to better deal with people living with dementia. Earlier funding from the Centre for Aging and Brain Health Innovation to assess the initiative has been enhanced with a $418,717 grant, over two years, from the Future Skills Centre to scale-up the training program. Now, 48 personal-support workers in both an urban (London) and rural (Northumberland County) settings are part of initiative.

CIHR IRSC

CIHR Project Grants back 10 Western-led projects. Health researchers at Western were awarded more than $8 million in funding from the Canadian Institutes of Health Research (CIHR) in the latest Project Grant competition. In total, 10 Western research projects were funded at Schulich Medicine & Dentistry and the Faculty of Health Sciences ranging from evaluating new ways of looking at spinal cord injury to understanding how neuroimaging can improve diagnostics for Parkinson's disease. More than half of the projects included teams of researchers working together, including Penny MacDonald and Ali Khan.

A new Brain and Mind Institute study is offering insights into how the our brains process a world in which the images of people, places and things are constantly shrinking, expanding and changing on the retina at the back of our eyes. These findings may hold further keys to perfecting technology in everything from robots to self-driving cars. Juan Chen, Melvyn Goodale and their collaborators at Western's Brain and Mind Institute, South China Normal University and the University of East Anglia (U.K.) also found that the representations of the real size of objects in the world emerge in the earliest stages of visual processing in the cerebral cortex of the brain.



Researchers in neuroscience, one of Western's signature areas, recently launched the Cognitive Neuroscience Research Registry, also known as OurBrainsCAN. "This new participant registry will not only give community members an easy and private way to sign up for research studies, but it will also allow us to do better science by engaging the whole community, and not just the young university students who traditionally are the majority of our research participants." said Ingrid Johnsrude, Director of the Brain and Mind Institute, one of the leaders of OurBrainsCAN. This registry aims to enrol 50,000 participants over a period of five years.

Canada Research Chairs
www.chairs-chaires.gc.ca

Western lands nine new CRCs among latest round, including Corey Baron, Natasha Mhatre and Marco Prado. Western will be home to 12 new and renewed Canada Research Chairs (CRC) whose work will have an impact on health care and economies terrestrially, as well as the cosmos celestially.

A poor diet might be damaging more than your waistline – it might be leading to cognitive decline and poor memory, according to Western-led research. The study, *Perineuronal Nets: Plasticity, Protection, and Therapeutic Potential*, describes the critical importance of perineuronal nets (PNNs) – structures that enmesh certain neurons in the brain – in protecting the neuron and regulating how often the brain turns experiences into memories. Amy Reichelt, a BrainsCAN Postdoctoral Fellow, along with Schulich School of Medicine & Dentistry neuroscientists Lisa Saksida and Tim Bussey, investigated PNNs to find out what effect they have on the brain and what happens when they're not working.

Touching on 'new frontiers' of technology and attracting more than 100 neuroscience researchers from around the world, the first international touchscreen symposium, *New frontiers in cognitive testing using touchscreen technology,* was held at Western University in the Western Interdisciplinary Research Building.

Study unlocks brain's role in moving about. Every office or family has one – the colleague who mistakenly walked into a wall or the sibling who mistook a closed glass door for an open entrance. Most of us, however, seem to have an innate sense of a room's geometry. Psychology professor Marieke Mur of Western's Brain and Mind Institute co-authored a paper exploring what regions of our brains are involved in understanding the boundaries of ever-changing environment.

Led by Education professor Daniel Ansari, the new Centre for the Science of Learning looks to generate evidence-based insights into how children learn best and then work closely with school boards and teachers to put that knowledge into classrooms and education boardrooms.

New Frontiers in Research Fund
Fonds Nouvelles frontières en recherche

Five Western researchers have been awarded more than $1.2 million for interdisciplinary research, ranging from pre-term birth predictors to concussions, as part of the federal government's New Frontiers in Research Fund. BMI researchers receiving funding include: Medical Biophysics Corey Baron, Microstructural imaging of concussion; Education Emma Duerden, Neuroimaging Biomarkers for Prenatal Detection of Preterm Birth; and Engineering Haojie Mao, Multi-disciplinary biomechanical and mathematical modelling of the brain to understand mild traumatic brain injury/concussion.

Dr. Adrian Owen was named an Officer of the Most Excellent Order of the British Empire (OBE), as part of the 2019 New Year's Honours list recognising "the achievements of a wide range of extraordinary people" across the United Kingdom. Owen's OBE award was presented to him by Prince William (vice-regal representative for Queen Elizabeth II) at a special ceremony in May 2019.

Western Research Chair, Dr. Ingrid Johnsrude has been named the new Director for the Brain and Mind Institute. She follows Psychology professor Mel Goodale, who founded the institute nearly two decades ago with Ravi Menon, a Medical Biophysics and Imaging professor. As the newly inaugurated director of the university's largest research group, Ingrid is encouraged by new technological and research developments – as well as new partnerships on campus, in the community and with industry – that could pave the way for breakthroughs in cognitive neuroscience.

Canada Research Chair in Sensorimotor Neuroscience , Andrew Pruszynski, was awarded the J.A.F. Stevenson award from the Canadian Physiological Society, for his cutting-edge research on sensorimotor function. The award recognizes an outstanding young Canadian physiologist with a visiting professorship. It provides an opportunity to promote collaboration and exchange of information among investigators at Canadian Universities through a keynote address at the annual meeting and an opportunity to lecture at universities across the country.

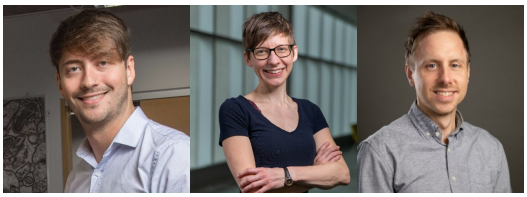
Brain injuries may be prevalent among patients exiting intensive care units (ICU), even if they entered the hospital for non-brain-related injuries or ailments, according to a new study by Western University and Lawson Health Research Institute. Schulich professor Dr. Marat Slessarev said these findings can shift how the medical community treats incoming patients and more importantly, outpatients following ICU visits.

BrainsCAN Postdoctoral Fellow Jeff Weiler found spinal cords contribute to complex hand functions, like the positioning of your hand in external space. Using specialized robotic technology, a three degree of freedom exoskeleton at Western's Brain and Mind Institute, subjects were asked to maintain their hand in a target position and then the robot bumped it away from the target by simultaneously flexing or extending the wrist and elbow. Researchers measured the time that it took for the muscles in the elbow and wrist to respond to the bump from the robot and whether these responses helped bring the hand back to the initial target.

Eric Wilkey, a postdoctoral scholar at Western's Brain and Mind Institute's Numerical Cognition Lab, was named a Banting Fellow. Eric is a cognitive neuroscientist focused on understanding how children learn and how disabilities may interfere with their educational goals. He uses advanced brain-imaging methods and a new theoretical approach to tackle specific brain mechanisms when it comes to the learning of math. Under the supervision of Psychology professor Daniel Ansari, Wilkey's research looks to pave the way to better diagnose learning disabilities and remediation of math deficits.

The Smart Healthy Campus program, initiated by Kinesiology professor Kevin Shoemaker with Mark Daley, aims to help students feel more connected, more accepted and better equipped to deal with academic and personal change. This Western-developed mobile app might be the key to helping students assess and manage their responses to stress – all part of a unique web of support in a push to help students work through the challenges of university life. Sponsored by the Office of the Vice-Provost (Academic Planning, Policy, and Faculty), the initiative is part of the Interdisciplinary Development Initiatives (IDI) program that provides three years of support to important collaborative projects that might not otherwise find a funding home.

BMI PhD candidate, Alex Cross is the lead author of a new paper, along with Psychology professor Marc Joanisse and Communication Sciences and Disorders professor Lisa Archibald, that studied the correlation of math challenges and language delays in children. The paper titled *Mathematical Abilities in Children With Developmental Language Disorder* was published in the January 2019 edition of Language, Speech and Hearing Services in Schools. In this paper, Alex suggested that teachers and parents work closely with speech -and-language pathologists to incorporate mathematical vocabulary and concepts into therapy sessions.



The Brain and Mind Institute welcomed three new faculty members who are also members of BrainsCAN's Computational Core. Lyle Muller, Marieke Mur and Taylor Schmitz are all based in Western's Interdisciplinary Research Building.

Western Psychology professors and BMI members Laura Batterink and Lindsay Bodell were named Rising Stars by the Association for Psychological Science (APS) in recognition of the pair being outstanding psychological scientists in the earliest stages of their post-PhD research careers. Batterink and Bodell were two of only six Canadian scientists named among the international class of 76.

For more BMI news stories, see:

https://www.uwo.ca/bmi/news/index.html

GRANTS HELD
BY BMI MEMBERS IN 2019

Funding Source	Core Members	Associate Members	Total *
Alzheimer Society	0	119,000	**119,000**
Brain Canada	185,000	0	**185,000**
Canada Research Chairs	1,319,600	1,292,350	**2,611,950**
CFI Innovation	0	1,356,457	**1,356,457**
CFI IOF	214,745	752,674	**967,419**
CFI LEF	564,789	200,000	**764,789**
CFREF Awards	1,565,769	557,942	**2,123,711**
CFREF Cores	4,598,930	0	**4,589,930**
CIFAR	187,500	0	**187,500**
CIHR Foundation	1,005,883	578,503	**1,584,386**
CIHR Operating	720,476	129,622	**850,098**
CIHR Project	1,353,543	775,909	**2,129,452**
CIHR Other	430,983	239,164	**670,147**
James S. Mcdonnell Foundation	150,000	0	**150,000**
MITACS Inc.	136,667	0	**136,667**
NSERC Discovery	1,925,799	959,250	**2,885,049**
NSERC Other	399,049	34,013	**433,062**
Ontario Brain Institute	108,613	0	**108,613**
Ontario Research Fund	742,388	233,333	**975,721**
SSHRC	174,495	124,270	**298,765**
Other External	1,057,622	1,455,436	**2,513,057**
Other Internal	1,090,213	882,485	**1,972,699**
Total	**17,932,062**	**9,690,408**	**27,622,470**

*Total portion of grants held in 2019 at Western University by lead PI

PUBLICATIONS 2019

BMI CORE MEMBERS IN BOLD (AND ITALICS)

Peer-reviewed Papers

1. Baggs, E., Raja, V., & **Anderson, M.L.** (2019) Culture in the world shapes culture in the head (and vice versa). *Behav Brain Sci*, **42**, e172.

2. Raja, V. & **Anderson, M.L.** (2019) Radical Embodied Cognitive Neuroscience. *null*, **31**, 166–181.

3. Schettler, A., Raja, V., & **Anderson, M.L.** (2019) The Embodiment of Objects: Review, Analysis, and Future Directions. *Front Neurosci*, **13**, 1332.

4. Thomas, M.S.C., **Ansari, D.,** & Knowland, V.C.P. (2019) Annual Research Review: Educational neuroscience: progress and prospects. *J Child Psychol Psychiatry*, **60**, 477–492.

5. Peters, L. & **Ansari, D.** (2019) Are specific learning disorders truly specific, and are they disorders? *Trends Neurosci Educ*, **17**, 100115.

6. Goffin, C., Sokolowski, H.M., Slipenkyj, M., & **Ansari, D.** (2019) Does writing handedness affect neural representation of symbolic number? An fMRI adaptation study. *Cortex*, **121**, 27–43.

7. Merkley, R., Conrad, B., Price, G., & **Ansari, D.** (2019) Investigating the visual number form area: a replication study. *R Soc Open Sci*, **6**, 182067.

8. Hawes, Z., Nosworthy, N., Archibald, L., & **Ansari, D.** (2019) Kindergarten children's symbolic number comparison skills relates to 1st grade mathematics achievement: Evidence from a two-minute paper-and-pencil test. *Learning and Instruction*, **59**, 21–33.

9. Hutchison, J.E., Lyons, I.M., & **Ansari, D.** (2019) More Similar Than Different: Gender Differences in Children's Basic Numerical Skills Are the Exception Not the Rule. *Child Dev*, **90**, e66–e79.

10. Hawes, Z., Sokolowski, H.M., Ononye, C.B., & **Ansari, D.** (2019) Neural underpinnings of numerical and spatial cognition: An fMRI meta-analysis of brain regions associated with symbolic number, arithmetic, and mental rotation. *Neurosci Biobehav Rev*, **103**, 316–336.

11. Matejko, A.A., Hutchison, J.E., & **Ansari, D.** (2019) Developmental specialization of the left intraparietal sulcus for symbolic ordinal processing. *Cortex*, **114**, 41–53.

12. Hawes, Z., Moss, J., Caswell, B., Seo, J., & **Ansari, D.** (2019) Relations between numerical, spatial, and executive function skills and mathematics achievement: A latent-variable approach. *Cogn Psychol*, **109**, 68–90.

13. Matejko, A.A. & **Ansari, D.** (2019) The neural association between arithmetic and basic numerical processing depends on arithmetic problem size and not chronological age. *Dev Cogn Neurosci*, **37**, 100653.

14. Gianetto-Berruti, A., Schranz, A.L., **Bartha, R.,** & Feyles, V. (2019) A preliminary magnetic resonance spectroscopy study of postmenopausal hormone effects on the brain. *Minerva Ginecol*, **71**, 392–393.

15. Albatany, M., Ostapchenko, V.G., Meakin, S., & **Bartha, R.** (2019) Brain tumor acidification using drugs simultaneously targeting multiple pH regulatory mechanisms. *J Neurooncol*, **144**, 453–462.

16. Broeke, N.C., Peterson, J., Lee, J., Martin, P.R., Farag, A., Gomez, J.A., Moussa, M., Gaed, M., Chin, J., Pautler, S.E., Ward, A., Bauman, G., **Bartha, R.,** & Scholl, T.J. (2019) Characterization of clinical human prostate cancer lesions using 3.0-T sodium MRI registered to Gleason-graded whole-mount histopathology. *J Magn Reson Imaging*, **49**, 1409–1419.

17. Haddad, S.M.H., Scott, C.J.M., Ozzoude, M., Holmes, M.F., Arnott, S.R., Nanayakkara, N.D., Ramirez, J., Black, S.E., Dowlatshahi, D., Strother, S.C., Swartz, R.H., Symons, S., Montero-Odasso, M., ONDRI Investigators, & **Bartha, R.** (2019) Comparison of quality control methods for automated diffusion tensor imaging analysis pipelines. *PLoS One*, **14**, e0226715.

18. Ryan, K., Schranz, A.L., Duggal, N., & **Bartha, R.** (2019) Differential effects of transcranial direct current stimulation on antiphase and inphase motor tasks: A pilot study. *Behav Brain Res*, **366**, 13–18.

19. McGregor, S.M.K., Detombe, S.A., Goncalves, S., Doyle-Pettypiece, P., **Bartha, R.,** & Duggal, N. (2019) Does the Neurological Examination Correlate with Patient-Perceived Outcomes in Degenerative Cervical Myelopathy? *World Neurosurg*, **132**, e885–e890.

20. Sakurai, R., **Bartha, R.,** & Montero-Odasso, M. (2019) Entorhinal Cortex Volume Is Associated With Dual-Task Gait Cost Among Older Adults With MCI: Results From the Gait and Brain Study. *J Gerontol A Biol Sci Med Sci*, **74**, 698–704.

21. Wilson, M., Andronesi, O., Barker, P.B., **Bartha, R.,** Bizzi, A., Bolan, P.J., Brindle, K.M., Choi, I.-Y., Cudalbu, C., Dydak, U., Emir, U.E., Gonzalez, R.G., Gruber, S., Gruetter, R., Gupta, R.K., Heerschap, A., Henning, A., Hetherington, H.P., Huppi, P.S., Hurd, R.E., Kantarci, K., Kauppinen, R.A., Klomp, D.W.J., Kreis, R., Kruiskamp, M.J., Leach, M.O., Lin, A.P., Luijten, P.R., Marjańska, M., Maudsley, A.A., Meyerhoff, D.J., Mountford, C.E., Mullins, P.G., Murdoch, J.B., Nelson, S.J., Noeske, R., Öz, G., Pan, J.W., Peet, A.C., Poptani, H., Posse, S., Ratai, E.-M., Salibi, N., Scheenen, T.W.J., Smith, I.C.P., Soher, B.J., Tkáč, I., Vigneron, D.B., & Howe, F.A. (2019) Methodological consensus on clinical proton MRS of the brain: Review and recommendations. *Magn Reson Med*, **82**, 527–550.

22. Jung, F., Kazemifar, S., **Bartha, R.,** & Rajakumar, N. (2019) Semiautomated Assessment of the Anterior Cingulate Cortex in Alzheimer's Disease. *J Neuroimaging*, **29**, 376–382.

23. Potvin, O., Chouinard, I., Dieumegarde, L., **Bartha, R.,** Bellec, P., Collins, D.L., Descoteaux, M., Hoge, R., Ramirez, J., Scott, C.J.M., Smith, E.E., Strother, S.C., Black, S.E., & Duchesne, S. (2019) The Canadian Dementia Imaging Protocol: Harmonization validity for morphometry measurements. *NeuroImage-Clin.*, **24**, 101943.

24. Duchesne, S., Chouinard, I., Potvin, O., Fonov, V.S., Khademi, A., **Bartha, R.,** Bellec, P., Collins, D.L., Descoteaux, M., Hoge, R., McCreary, C.R., Ramirez, J., Scott, C.J.M., Smith, E.E., Strother, S.C., Black, S.E., & CIMA-Q group and the CCNA group (2019) The Canadian Dementia Imaging Protocol: Harmonizing National Cohorts. *J Magn Reson Imaging*, **49**, 456–465.

25. Albatany, M., Meakin, S., & **Bartha, R.** (2019) The Monocarboxylate transporter inhibitor Quercetin induces intracellular acidification in a mouse model of Glioblastoma Multiforme: in-vivo detection using magnetic resonance imaging. *Invest New Drugs*, **37**, 595–601.

26. Sunderland, K.M., Beaton, D., Fraser, J., Kwan, D., McLaughlin, P.M., Montero-Odasso, M., Peltsch, A.J., Pieruccini-Faria, F., Sahlas, D.J., Swartz, R.H., ONDRI Investigators (**Bartha, R.** et al), Strother, S.C., & Binns, M.A. (2019) The utility of multivariate outlier detection techniques for data quality evaluation in large studies: an application within the ONDRI project. *BMC Med Res Methodol*, **19**, 102.

27. Snir, J.A., **Bartha, R.,** & Montero-Odasso, M. (2019) White matter integrity is associated with gait impairment and falls in mild cognitive impairment. Results from the gait and brain study. *Neuroimage Clin*, **24**, 101975.

28. Ostapchenko, V.G., Snir, J., Suchy, M., Fan, J., Cobb, M.R., *Chronik, B.A.,* Kovacs, M., Prado, V.F., Hudson, R.H.E., Pasternak, S.H., Prado, M.A.M., & **Bartha, R.** (2019) Detection of Active Caspase-3 in Mouse Models of Stroke and Alzheimer's Disease with a Novel Dual Positron Emission Tomography/Fluorescent Tracer [68Ga]Ga-TC3-OGDOTA. *Contrast Media Mol Imaging*, **2019**, 6403274.

29. Silveira, C.R.A., MacKinley, J., Coleman, K., Li, Z., Finger, E., **Bartha, R.,** Morrow, S.A., Wells, J., Borrie, M., Tirona, R.G., Rupar, C.A., Zou, G., Hegele, R.A., Mahuran, D., MacDonald, P., Jenkins, M.E., Jog, M., & Pasternak, S.H. (2019) Ambroxol as a novel disease-modifying treatment for Parkinson's disease dementia: protocol for a single-centre, randomized, double-blind, placebo-controlled trial. *BMC Neurol.*, **19**, 20.

30. Beraldo, F.H., Palmer, D., Memar, S., Wasserman, D.I., Lee, W.-J.V., Liang, S., Creighton, S.D., Kolisnyk, B., Cowan, M.F., Mels, J., Masood, T.S., Fodor, C., Al-Onaizi, M.A., **Bartha, R.,** Gee, T., *Saksida, L.M., Bussey, T.J.,* Strother, S.S., Prado, V.F., Winters, B.D., & Prado, M.A. (2019) MouseBytes, an open-access high-throughput pipeline and database for rodent touchscreen-based cognitive assessment. *Elife*, **8**:e49630.

31. McCunn, P., Gilbert, K.M., Zeman, P., Li, A.X., Strong, M.J., *Khan, A.R.,* & **Bartha, R.** (2019) Reproducibility of Neurite Orientation Dispersion and Density Imaging (NODDI) in rats at 9.4 Tesla. *PLoS One*, **14**, e0215974.

32. Moszczynski, A.J., Harvey, M., Fulcher, N., de Oliveira, C., McCunn, P., Donison, N., **Bartha, R.,** *Schmid, S.,* Strong, M.J., & Volkening, K. (2019) Synergistic toxicity in an in vivo model of neurodegeneration through the co-expression of human TDP-43M337V and tauT175D protein. *Acta Neuropathol Commun*, **7**, 170.

33. **Batterink, L.J.** & Paller, K.A. (2019) Statistical learning of speech regularities can occur outside the focus of attention. *Cortex*, **115**, 56–71.

34. **Batterink, L.J.,** Paller, K.A., & Reber, P.J. (2019) Understanding the Neural Bases of Implicit and Statistical Learning. *Top Cogn Sci*, **11**, 482–503.

35. Mantanona, C.P., Alsiö, J., Elson, J.L., Fisher, B.M., Dalley, J.W., **Bussey, T.,** & Pienaar, I.S. (2019) Altered motor, anxiety-related and attentional task performance at baseline associate with multiple gene copies of the vesicular acetylcholine transporter and related protein overexpression in ChAT::Cre+ rats. *Brain Struct Funct*, **224**, 3095–3116.

36. Lim, J., Kim, E., Noh, H.J., Kang, S., Phillips, B.U., Kim, D.G., **Bussey, T.J.,** *Saksida, L.,* Heath, C.J., & Kim, C.H. (2019) Assessment of mGluR5 KO mice under conditions of low stress using a rodent touchscreen apparatus reveals impaired behavioural flexibility driven by perseverative responses. *Mol Brain*, **12**, 37.

37. Hailwood, J.M., Heath, C.J., Phillips, B.U., Robbins, T.W., *Saksida, L.M.,* & **Bussey, T.J.** (2019) Blockade of muscarinic acetylcholine receptors facilitates motivated behaviour and rescues a model of antipsychotic-induced amotivation. *Neuropsychopharmacology*, **44**, 1068–1075.

38. Ratcliff, M., Rees, D., McGrady, S., Buntwal, L., Hornsby, A.K.E., Bayliss, J., Kent, B.A., **Bussey, T.,** *Saksida, L.,* Beynon, A.L., Howell, O.W., Morgan, A.H., Sun, Y., Andrews, Z.B., Wells, T., & Davies, J.S. (2019) Calorie restriction activates new adult born olfactory-bulb neurones in a ghrelin-dependent manner but acyl-ghrelin does not enhance subventricular zone neurogenesis. *Journal of Neuroendocrinology*, **31**, e12755.

39. Phillips, B.U., Lopez-Cruz, L., *Saksida, L.M.,* & **Bussey, T.J.** (2019) Translational tests involving non-reward: methodological considerations. *Psychopharmacology (Berl)*, **236**, 449–461.

40. Tse, W.H., Chen, L., McCurdy, C.M., Tarapacki, C.M., **Chronik, B.A.,** & Zhang, J. (2019) Development of biocompatible NaGdF4: Er3+, Yb3+ upconversion nanoparticles used as contrast agents for bio-imaging. *The Canadian Journal of Chemical Engineering*, **97**, 2678–2684.

41. Attaran, A., Handler, W.B., & **Chronik, B.A.** (2019) RF injection network development for testing of active implantable medical devices exposed to RF fields in 1.5 T MRI systems. *IEEE Journal of Electromagnetics, RF and Microwaves in Medicine and Biology*, **4**, 2–9.

42. Attaran, A., Wawrzyn, C.M., Handler, W.B., & **Chronik, B.A.** (2019) Ultra-low frequency magnetic field probe for field measurements in gradient coils during medical device testing. *Electronics Letters*, **55**, 634–636.

43. Sakhr, J. & **Chronik, B.A.** (2019) Harmonic Standing-Wave Excitations of Simply-Supported Isotropic Solid Elastic Circular Cylinders: Exact 3D Linear Elastodynamic Response. *arXiv preprint arXiv:1904.02051*.

44. Moyer, R., Birmingham, T., Eckstein, F., Wirth, W., Maschek, S., **Chronik, B.,** & Giffin, J.R. (2019) Validation of a novel blinding method for measuring postoperative knee articular cartilage using magnetic resonance imaging. *Magnetic Resonance Materials in Physics, Biology and Medicine*, **32**, 693–702.

45. Verbruggen, F., Aron, A.R., Band, G.P., Beste, C., Bissett, P.G., Brockett, A.T., Brown, J.W., Chamberlain, S.R., Chambers, C.D., Colonius, H., Colzato, L.S., **Corneil, B.D.,** Coxon, J.P., Dupuis, A., Eagle, D.M., Garavan, H., Greenhouse, I., Heathcote, A., Huster, R.J., Jahfari, S., Kenemans, J.L., Leunissen, I., Li, C.-S.R., Logan, G.D., Matzke, D., Morein-Zamir, S., Murthy, A., Paré, M., Poldrack, R.A., Ridderinkhof, K.R., Robbins, T.W., Roesch, M., Rubia, K., Schachar, R.J., Schall, J.D., Stock, A.-K., Swann, N.C., Thakkar, K.N., van der Molen, M.W., Vermeylen, L., Vink, M., Wessel, J.R., Whelan, R., Zandbelt, B.B., & Boehler, C.N. (2019) A consensus guide to capturing the ability to inhibit actions and impulsive behaviors in the stop-signal task. *Elife*, **8**.

46. Gu, C., *Pruszynski, J.A., Gribble, P.L.,* & **Corneil, B.D.** (2019) A rapid visuomotor response on the human upper limb is selectively influenced by implicit motor learning. *J Neurophysiol*, **121**, 85–95.

47. Mohammed Ali, F., Westling, M., Zhao, L.H.L., **Corneil, B.D**., & Camp, A.J. (2019) Splenius capitis: sensitive target for the cVEMP in older and neurodegenerative patients. *Eur Arch Otorhinolaryngol*, **276**, 2991–3003.

48. Kozak, R.A., Kreyenmeier, P., Gu, C., Johnston, K., & **Corneil, B.D.** (2019) Stimulus-Locked Responses on Human Upper Limb Muscles and Corrective Reaches Are Preferentially Evoked by Low Spatial Frequencies. *eNeuro*, **6**.

49. Sedov, A., Usova, S., Semenova, U., Gamaleya, A., Tomskiy, A., Crawford, J.D., **Corneil, B.,** Jinnah, H.A., & Shaikh, A.G. (2019) The role of pallidum in the neural integrator model of cervical dystonia. *Neurobiol Dis*, **125**, 45–54.

50. Freud, E., **Culham, J.C.,** Namdar, G., & Behrmann, M. (2019) Object complexity modulates the association between action and perception in childhood. *J Exp Child Psychol*, **179**, 56–72.

51. Gallivan, J.P., Chapman, C.S., Gale, D.J., Flanagan, J.R., & **Culham, J.C.** (2019) Selective Modulation of Early Visual Cortical Activity by Movement Intention. *Cereb Cortex*, **29**, 4662–4678.

52. Arcaro, M.J., Thaler, L., Quinlan, D.J., Monaco, S., Khan, S., Valyear, K.F., Goebel, R., Dutton, G.N., *Goodale, M.A.,* Kastner, S., & **Culham, J.C.** (2019) Psychophysical and neuroimaging responses to moving stimuli in a patient with the Riddoch phenomenon due to bilateral visual cortex lesions. *Neuropsychologia*, **128**, 150–165.

53. Cuevas, P., Steines, M., He, Y., Nagels, A., **Culham, J.,** & Straube, B. (2019) The facilitative effect of gestures on the neural processing of semantic complexity in a continuous narrative. *Neuroimage*, **195**, 38–47.

54. Hernandez-Castillo, C.R., Limperopoulos, C., & **Diedrichsen, J.** (2019) A representative template of the neonatal cerebellum. *Neuroimage*, **184**, 450–454.

55. Beukema, P., **Diedrichsen, J.,** & Verstynen, T.D. (2019) Binding During Sequence Learning Does Not Alter Cortical Representations of Individual Actions. *J Neurosci*, **39**, 6968–6977.

56. Espenhahn, S., van Wijk, B.C.M., Rossiter, H.E., de Berker, A.O., Redman, N.D., Rondina, J., **Diedrichsen, J.,** & Ward, N.S. (2019) Cortical beta oscillations are associated with motor performance following visuomotor learning. *Neuroimage*, **195**, 340–353.

57. King, M., Hernandez-Castillo, C.R., Poldrack, R.A., Ivry, R.B., & **Diedrichsen, J.** (2019) Functional boundaries in the human cerebellum revealed by a multi-domain task battery. *Nat Neurosci*, **22**, 1371–1378.

58. Berlot, E., Prichard, G., O'Reilly, J., Ejaz, N., & **Diedrichsen, J.** (2019) Ipsilateral finger representations in the sensorimotor cortex are driven by active movement processes, not passive sensory input. *J Neurophysiol*, **121**, 418–426.

59. Yokoi, A. & **Diedrichsen, J.** (2019) Neural Organization of Hierarchical Motor Sequence Representations in the Human Neocortex. *Neuron*, **103**, 1178-1190.e7.

60. Wesselink, D.B., van den Heiligenberg, F.M., Ejaz, N., Dempsey-Jones, H., Cardinali, L., Tarall-Jozwiak, A., **Diedrichsen, J.,** & Makin, T.R. (2019) Obtaining and maintaining cortical hand representation as evidenced from acquired and congenital handlessness. *Elife*, **8**.

61. Kriegeskorte, N. & **Diedrichsen, J.** (2019) Peeling the Onion of Brain Representations. *Annu Rev Neurosci*, **42**, 407–432.

62. Ejaz, N., Xu, J., Branscheidt, M., Hertler, B., Schambra, H., Widmer, M., Faria, A.V., Harran, M., Cortes, J.C., Kim, N., Celnik, P.A., Kitago, T., Luft, A., Krakauer, J.W., & **Diedrichsen, J.** (2019) Reply: Further evidence for a non-cortical origin of mirror movements after stroke. *Brain*, **142**, e2.

63. Xu, J., Branscheidt, M., Schambra, H., Steiner, L., Widmer, M., **Diedrichsen, J.,** Goldsmith, J., Lindquist, M., Kitago, T., Luft, A.R., Krakauer, J.W., Celnik, P.A., & SMARTS Study Group (2019) Rethinking interhemispheric imbalance as a target for stroke neurorehabilitation. *Ann Neurol*, **85**, 502–513.

64. Ariani, G. & **Diedrichsen, J.** (2019) Sequence learning is driven by improvements in motor planning. *J Neurophysiol*, **121**, 2088–2100.

65. Evans, S., Price, C.J., **Diedrichsen, J.,** Gutierrez-Sigut, E., & MacSweeney, M. (2019) Sign and Speech Share Partially Overlapping Conceptual Representations. *Curr Biol*, **29**, 3739-3747.e5.

66. Arbuckle, S.A., Yokoi, A., *Pruszynski, J.A.,* & **Diedrichsen, J.** (2019) Stability of representational geometry across a wide range of fMRI activity levels. *Neuroimage*, **186**, 155–163.

67. **Diedrichsen, J.,** King, M., Hernandez-Castillo, C., Sereno, M., & Ivry, R.B. (2019) Universal Transform or Multiple Functionality? Understanding the Contribution of the Human Cerebellum across Task Domains. *Neuron*, **102**, 918–928.

68. Friston, K.J., **Diedrichsen, J.,** Holmes, E., & Zeidman, P. (2019) Variational representational similarity analysis. *Neuroimage*, **201**, 115986.

69. Urbain, C., Sato, J., Hammill, C., **Duerden, E.G.,** & Taylor, M.J. (2019) Converging function, structure, and behavioural features of emotion regulation in very preterm children. *Hum Brain Mapp*, **40**, 3385–3397.

70. Guo, T., Chau, V., Peyvandi, S., Latal, B., McQuillen, P.S., Knirsch, W., Synnes, A., Feldmann, M., Naef, N., Chakravarty, M.M., De Petrillo, A., **Duerden, E.G.,** Barkovich, A.J., & Miller, S.P. (2019) White matter injury in term neonates with congenital heart diseases: Topology & comparison with preterm newborns. *Neuroimage*, **185**, 742–749.

71. **Duerden, E.G.,** Halani, S., Ng, K., Guo, T., Foong, J., Glass, T.J.A., Chau, V., Branson, H.M., Sled, J.G., Whyte, H.E., Kelly, E.N., & Miller, S.P. (2019) White matter injury predicts disrupted functional connectivity and microstructure in very preterm born neonates. *Neuroimage Clin*, **21**, 101596.

72. Pur, D.R., **Eagleson, R.A.,** de Ribaupierre, A., Mella, N., & de Ribaupierre, S. (2019) Moderating Effect of Cortical Thickness on BOLD Signal Variability Age-Related Changes. *Front Aging Neurosci*, **11**, 46.

73. Shen, K., Bezgin, G., Schirner, M., Ritter, P., **Everling, S.,** & McIntosh, A.R. (2019) A macaque connectome for large-scale network simulations in TheVirtualBrain. *Sci Data*, **6**, 123.

74. Ghahremani, M., Johnston, K.D., Ma, L., Hayrynen, L.K., & **Everling, S.** (2019) Electrical microstimulation evokes saccades in posterior parietal cortex of common marmosets. *J Neurophysiol*, **122**, 1765–1776.

75. Shen, K., Goulas, A., Grayson, D.S., Eusebio, J., Gati, J.S., *Menon, R.S.*, McIntosh, A.R., & **Everling, S.** (2019) Exploring the limits of network topology estimation using diffusion-based tractography and tracer studies in the macaque cortex. *Neuroimage*, **191**, 81–92.

76. Selvanayagam, J., Johnston, K.D., Schaeffer, D.J., Hayrynen, L.K., & **Everling, S.** (2019) Functional Localization of the Frontal Eye Fields in the Common Marmoset Using Microstimulation. *J Neurosci*, **39**, 9197 –9206.

77. Schaeffer, D.J., Gilbert, K.M., Hori, Y., Gati, J.S., *Menon, R.S.,* & **Everling, S.** (2019) Integrated radiofrequency array and animal holder design for minimizing head motion during awake marmoset functional magnetic resonance imaging. *Neuroimage*, **193**, 126–138.

78. Schaeffer, D.J., Gilbert, K.M., Gati, J.S., *Menon, R.S.,* & **Everling, S.** (2019) Intrinsic Functional Boundaries of Lateral Frontal Cortex in the Common Marmoset Monkey. *J Neurosci*, **39**, 1020–1029.

79. Schaeffer, D.J., Gilbert, K.M., Ghahremani, M., Gati, J.S., *Menon, R.S.,* & **Everling, S.** (2019) Intrinsic functional clustering of anterior cingulate cortex in the common marmoset. *Neuroimage*, **186**, 301–307.

80. Ma, L., Chan, J.L., Johnston, K., *Lomber, S.G.,* & **Everling, S.** (2019) Macaque anterior cingulate cortex deactivation impairs performance and alters lateral prefrontal oscillatory activities in a rule-switching task. *PLoS Biol*, **17**, e3000045.

81. Johnston, K., Ma, L., Schaeffer, L., & **Everling, S.** (2019) Alpha Oscillations Modulate Preparatory Activity in Marmoset Area 8Ad. *J Neurosci*, **39**, 1855–1866.

82. Adam, R., Johnston, K., & **Everling, S.** (2019) Recovery of contralesional saccade choice and reaction time deficits after a unilateral endothelin-1-induced lesion in the macaque caudal prefrontal cortex. *J Neurophysiol*, **122**, 672–690.

83. Schaeffer, D.J., Gilbert, K.M., Hori, Y., Hayrynen, L.K., Johnston, K.D., Gati, J.S., *Menon, R.S.,* & **Everling, S.** (2019) Task-based fMRI of a free-viewing visuo-saccadic network in the marmoset monkey. *Neuroimage*, **202**, 116147.

84. Kithu, M.C., Saccone, E.J., Crewther, S.G., **Goodale, M.A.,** & Chouinard, P.A. (2019) A pantomiming priming study on the grasp and functional use actions of tools. *Exp Brain Res*, **237**, 2155–2165.

85. Striemer, C.L., Whitwell, R.L., & **Goodale, M.A**. (2019) Affective blindsight in the absence of input from face processing regions in occipital-temporal cortex. *Neuropsychologia*, **128**, 50–57.

86. Ganel, T. & **Goodale, M.A.** (2019) Still holding after all these years: An action-perception dissociation in patient DF. *Neuropsychologia*, **128**, 249–254.

87. Chen, J., Sperandio, I., Henry, M.J., & **Goodale, M.A.** (2019) Changing the Real Viewing Distance Reveals the Temporal Evolution of Size Constancy in Visual Cortex. *Curr Biol*, **29**, 2237-2243.e4.

88. Laycock, R., Wood, K., Wright, A., Crewther, S.G., & **Goodale, M.A.** (2019) Saccade Latency Provides Evidence for Reduced Face Inversion Effects With Higher Autism Traits. *Front Hum Neurosci*, **13**, 470.

89. Paulun, V.C., Buckingham, G., **Goodale, M.A.,** & Fleming, R.W. (2019) The material-weight illusion disappears or inverts in objects made of two materials. *J Neurophysiol*, **121**, 996–1010.

90. Ready, E.A., McGarry, L.M., Rinchon, C., Holmes, J.D., & **Grahn, J.A.** (2019) Beat perception ability and instructions to synchronize influence gait when walking to music-based auditory cues. *Gait Posture*, **68**, 555–561.

91. Taylor, J.E.T. & **Grahn, J.A.** (2019) Simple random-interval generation reveals the irresistibly periodic structure of perceived time. *Atten Percept Psychophys*, **81**, 1204–1208.

92. Coltman, S.K., Cashaback, J.G.A., & **Gribble, P.L.** (2019) Both fast and slow learning processes contribute to savings following sensorimotor adaptation. *J Neurophysiol*, **121**, 1575–1583.

93. Ohashi, H., Valle-Mena, R., **Gribble, P.L.,** & Ostry, D.J. (2019) Movements following force-field adaptation are aligned with altered sense of limb position. *Exp Brain Res*, **237**, 1303–1313.

94. Palidis, D.J., Cashaback, J.G.A., & **Gribble, P.L.** (2019) Neural signatures of reward and sensory error feedback processing in motor learning. *J Neurophysiol*, **121**, 1561–1574.

95. Ohashi, H., **Gribble, P.L.,** & Ostry, D.J. (2019) Somatosensory cortical excitability changes precede those in motor cortex during human motor learning. *J Neurophysiol*, **122**, 1397–1405.

96. Cashaback, J.G.A., Lao, C.K., Palidis, D.J., Coltman, S.K., McGregor, H.R., & **Gribble, P.L.** (2019) The gradient of the reinforcement landscape influences sensorimotor learning. *PLoS Comput Biol*, **15**, e1006839.

97. Gabel, L.N., Daoust, A.R., Salisbury, M.R., *Grahn, J.A.,* Durbin, C.E., & **Hayden, E.P.** (2019) Development and validation of a battery of emotionally evocative film clips for use with young children. *Psychol Assess*, **31**, 1040–1051.

98. Mohamed Ali, O., Vandermeer, M.R.J., Sheikh, H.I., *Joanisse, M.F.,* & **Hayden, E.P.** (2019) Girls' internalizing symptoms and white matter tracts in Cortico-Limbic circuitry. *Neuroimage Clin*, **21**, 101650.

99. Kotelnikova, Y., Clark, L.A., & **Hayden, E.P.** (2019) Development and Initial Validation of the Schedule for Nonadaptive and Adaptive Personality Brief Other-Description Rating Form (SNAP-BORF). *J Psychopathol Behav Assess*, **41**, 470–484.

100. Tiv, M., Gonnerman, L., Whitford, V., Friesen, D., **Jared, D.,** & Titone, D. (2019) Figuring Out How Verb-Particle Constructions Are Understood During L1 and L2 Reading. *Front Psychol*, **10**, 1733.

101. Cross, A.M., **Joanisse, M.F.,** & Archibald, L.M.D. (2019) Mathematical Abilities in Children With Developmental Language Disorder. *Lang Speech Hear Serv Sch*, **50**, 150–163.

102. Archibald, L.M.D., Cardy, J.O., *Ansari, D.,* Olino, T., & **Joanisse, M.F.** (2019) The consistency and cognitive predictors of children's oral language, reading, and math learning profiles. *Learning and Individual Differences*, **70**, 130–141.

103. Mundinano, I.-C., Chen, J., de Souza, M., Sarossy, M.G., **Joanisse, M.F.,** *Goodale, M.A.,* & Bourne, J.A. (2019) More than blindsight: Case report of a child with extraordinary visual capacity following perinatal bilateral occipital lobe injury. *Neuropsychologia*, **128**, 178–186.

104. Cummine, J., Boliek, C.A., McKibben, T., Jaswal, A., & **Joanisse, M.F.** (2019) Transcranial direct current stimulation (tDCS) selectively modulates semantic information during reading. *Brain Lang*, **188**, 11–17.

105. Billig, A.J., Herrmann, B., Rhone, A.E., Gander, P.E., Nourski, K.V., Snoad, B.F., Kovach, C.K., Kawasaki, H., Howard, M.A., & **Johnsrude, I.S.** (2019) A Sound-Sensitive Source of Alpha Oscillations in Human Non -Primary Auditory Cortex. *J Neurosci*, **39**, 8679–8689.

106. Herrmann, B., Buckland, C., & **Johnsrude, I.S.** (2019) Neural signatures of temporal regularity processing in sounds differ between younger and older adults. *Neurobiol Aging*, **83**, 73–85.

107. Domingo, Y., Holmes, E., Macpherson, E., & **Johnsrude, I.S.** (2019) Using spatial release from masking to estimate the magnitude of the familiar-voice intelligibility benefit. *J Acoust Soc Am*, **146**, 3487.

108. Lau, J.C., Parrent, A.G., Demarco, J., Gupta, G., Kai, J., Stanley, O.W., Kuehn, T., Park, P.J., Ferko, K., **Khan, A.R.,** & Peters, T.M. (2019) A framework for evaluating correspondence between brain images using anatomical fiducials. *Hum Brain Mapp*, **40**, 4163–4179.

109. Xiao, Y., Lau, J.C., Anderson, T., DeKraker, J., Collins, D.L., Peters, T., & **Khan, A.R.** (2019) An accurate registration of the BigBrain dataset with the MNI PD25 and ICBM152 atlases. *Sci Data*, **6**, 210.

110. Maier-Hein, K.H., Neher, P.F., Houde, J.-C., Côté, M.-A., Garyfallidis, E., Zhong, J., Chamberland, M., Yeh, F.-C., Lin, Y.-C., Ji, Q., Reddick, W.E., Glass, J.O., Chen, D.Q., Feng, Y., Gao, C., Wu, Y., Ma, J., He, R., Li, Q., Westin, C.-F., Deslauriers-Gauthier, S., González, J.O.O., Paquette, M., St-Jean, S., Girard, G., Rheault, F., Sidhu, J., Tax, C.M.W., Guo, F., Mesri, H.Y., Dávid, S., Froeling, M., Heemskerk, A.M., Leemans, A., Boré, A., Pinsard, B., Bedetti, C., Desrosiers, M., Brambati, S., Doyon, J., Sarica, A., Vasta, R., Cerasa, A., Quattrone, A., Yeatman, J., **Khan, A.R.,** Hodges, W., Alexander, S., Romascano, D., Barakovic, M., Auría, A., Esteban, O., Lemkaddem, A., Thiran, J.-P., Cetingul, H.E., Odry, B.L., Mailhe, B., Nadar, M.S., Pizzagalli, F., Prasad, G., Villalon-Reina, J.E., Galvis, J., Thompson, P.M., De Santiago Requejo, F., Laguna, P.L., Lacerda, L.M., Barrett, R., Dell'Acqua, F., Catani, M., Petit, L., Caruyer, E., Daducci, A., Dyrby, T.B., Holland-Letz, T., Hilgetag, C.C., Stieltjes, B., & Descoteaux, M. (2019) Author Correction: The challenge of mapping the human connectome based on diffusion tractography. *Nat Commun*, **10**, 5059.

111. Ulhassan, Z., Gill, R.A., Huang, H., Ali, S., Mwamba, T.M., Ali, B., Huang, Q., Hamid, Y., **Khan, A.R.,** Wang, J., & Zhou, W. (2019) Selenium mitigates the chromium toxicity in Brassicca napus L. by ameliorating nutrients uptake, amino acids metabolism and antioxidant defense system. *Plant Physiol Biochem*, **145**, 142–152.

112. Perez, E.C., Bravo, D.R., Rodgers, S.P., **Khan, A.R.,** & Leasure, J.L. (2019) Shaping the adult brain with exercise during development: Emerging evidence and knowledge gaps. *Int J Dev Neurosci*, **78**, 147–155.

113. Global Burden of Disease Health Financing Collaborator Network (**Kohler, S.** et al) (2019) Past, present, and future of global health financing: a review of development assistance, government, out-of-pocket, and other private spending on health for 195 countries, 1995-2050. *Lancet*, **393**, 2233–2260.

114. Martin, C.B., Mirsattari, S.M., Pruessner, J.C., Burneo, J.G., Hayman-Abello, B., & **Köhler, S.** (2019) Relationship between déjà vu experiences and recognition-memory impairments in temporal-lobe epilepsy. *Memory*, 1–11.

115. Frankland, P.W., Josselyn, S.A., & **Köhler, S.** (2019) The neurobiological foundation of memory retrieval. *Nat Neurosci*, **22**, 1576–1585.

116. Inhoff, M.C., Heusser, A.C., Tambini, A., Martin, C.B., O'Neil, E.B., **Köhler, S.,** Meager, M.R., Blackmon, K., Vazquez, B., Devinsky, O., & Davachi, L. (2019) Understanding perirhinal contributions to perception and memory: Evidence through the lens of selective perirhinal damage. *Neuropsychologia*, **124**, 9–18.

117. **Kohler, S.,** Keil, T., Reinhold, T., Müller-Riemenschneider, F., Willich, S.N., & Roll, S. (2019) Usage of a German prevention and health promotion web portal and cost per pageview: A life-cycle assessment. *Digit Health*, **5**, 2055207619872090.

118. Anderson, N.D., Martin, C.B., Czyzo, J., & **Köhler, S.** (2019) When Gist and Familiarity Collide: Evidence From False Recognition in Younger and Older Adults. *J Gerontol B Psychol Sci Soc Sci*, **74**, 927–932.

119. Yang, H., Laforge, G., Stojanoski, B., Nichols, E.S., *McRae, K.,* & **Köhler, S.** (2019) Late positive complex in event-related potentials tracks memory signals when they are decision relevant. *Sci Rep*, **9**, 9469.

120. Wong, C. & **Lomber, S.G.** (2019) Stable Delay Period Representations in the Posterior Parietal Cortex Facilitate Working-Memory-Guided Obstacle Negotiation. *Curr Biol*, **29**, 70-80.e3.

121. Alencar, C.D.C., *Butler, B.E.,* & **Lomber, S.G.** (2019) What and How the Deaf Brain Sees. *J Cogn Neurosci*, **31**, 1091–1109.

122. Khan, A.R., Hiebert, N.M., Vo, A., Wang, B.T., *Owen, A.M.,* Seergobin, K.N., & **MacDonald, P.A.** (2019) Biomarkers of Parkinson's disease: Striatal sub-regional structural morphometry and diffusion MRI. *Neuroimage Clin*, **21**, 101597.

123. Hiebert, N.M., *Owen, A.M.,* Ganjavi, H., Mendonça, D., Jenkins, M.E., Seergobin, K.N., & **MacDonald, P.A.** (2019) Dorsal striatum does not mediate feedback-based, stimulus-response learning: An event-related fMRI study in patients with Parkinson's disease tested on and off dopaminergic therapy. *Neuroimage*, **185**, 455–470.

124. Yabe, Y., *Goodale, M.A.,* & **MacDonald, P.A.** (2019) Investigating the perceived timing of sensory events triggering actions in patients with Parkinson's disease and the effects of dopaminergic therapy. *Cortex*, **115**, 309–323.

125. Witt, I., Ganjavi, H., & **MacDonald, P.** (2019) Relationship between Freezing of Gait and Anxiety in Parkinson's Disease Patients: A Systemic Literature Review. *Parkinson’s Disease*, **2019**, e6836082.

126. Diez, A., Cui, A., & **MacDougall-Shackleton, S.A.** (2019) The neural response of female zebra finches (Taeniopygia guttata) to conspecific, heterospecific, and isolate song depends on early-life song exposure. *Behav Processes*, **163**, 37–44.

127. **MacDougall-Shackleton, S.A.,** Bonier, F., Romero, L.M., & Moore, I.T. (2019) Glucocorticoids and "Stress" Are Not Synonymous. *Integrative Organismal Biology*, **1**.

128. Kelly, T.R., Hobson, K.A., Casbourn, G.W., MacDougall-Shackleton, E.A., & **MacDougall-Shackleton, S.A.** (2019) Long-term winter-site fidelity in Song Sparrows (Melospiza melodia). *The Auk*, **136**.

129. Zanette, L.Y., Hobbs, E.C., Witterick, L.E., **MacDougall-Shackleton, S.A.,** & Clinchy, M. (2019) Predator-induced fear causes PTSD-like changes in the brains and behaviour of wild animals. *Sci Rep*, **9**, 11474.

130. Narla, C., Jung, P.S., Bautista Cruz, F., Everest, M., **Martinez-Trujillo, J.,** & Poulter, M.O. (2019) CRF Mediates Stress-Induced Pathophysiological High-Frequency Oscillations in Traumatic Brain Injury. *eNeuro*, **6**.

131. Duong, L., Leavitt, M., Pieper, F., Sachs, A., & **Martinez-Trujillo, J.** (2019) A Normalization Circuit Underlying Coding of Spatial Attention in Primate Lateral Prefrontal Cortex. *eNeuro*, **6**.

132. Malek, N., Messinger, D., Gao, A.Y.L., Krumhuber, E., Mattson, W., Joober, R., Tabbane, K., & **Martinez-Trujillo, J.C.** (2019) Generalizing Duchenne to sad expressions with binocular rivalry and perception ratings. *Emotion*, **19**, 234–241.

133. Tremblay, S., Pieper, F., Sachs, A., Joober, R., & **Martinez-Trujillo, J.** (2019) The Effects of Methylphenidate (Ritalin) on the Neurophysiology of the Monkey Caudal Prefrontal Cortex. *eNeuro*, **6**.

134. Elman, J.L. & **McRae, K.** (2019) A model of event knowledge. *Psychol Rev*, **126**, 252–291.

135. Koecher, K.J., McKeown, N.M., Sawicki, C.M., **Menon, R.S.,** & Slavin, J.L. (2019) Effect of whole-grain consumption on changes in fecal microbiota: a review of human intervention trials. *Nutr Rev*, **77**, 487–497.

136. Manning, K.Y., Llera, A., Dekaban, G.A., *Bartha, R.,* Barreira, C., Brown, A., Fischer, L., Jevremovic, T., Blackney, K., Doherty, T.J., Fraser, D.D., Holmes, J., Beckmann, C.F., & **Menon, R.S.** (2019a) Linked MRI signatures of the brain's acute and persistent response to concussion in female varsity rugby players. *Neuroimage Clin*, **21**, 101627.

137. Oh, J., Ontaneda, D., Azevedo, C., Klawiter, E.C., Absinta, M., Arnold, D.L., Bakshi, R., Calabresi, P.A., Crainiceanu, C., Dewey, B., Freeman, L., Gauthier, S., Henry, R., Inglese, M., Kolind, S., Li, D.K.B., Mainero, C., **Menon, R.S.,** Nair, G., Narayanan, S., Nelson, F., Pelletier, D., Rauscher, A., Rooney, W., Sati, P., Schwartz, D., Shinohara, R.T., Tagge, I., Traboulsee, A., Wang, Y., Yoo, Y., Yousry, T., Zhang, Y., Sicotte, N.L., Reich, D.S., & North American Imaging in Multiple Sclerosis Cooperative (2019) Imaging outcome measures of neuroprotection and repair in MS: A consensus statement from NAIMS. *Neurology*, **92**, 519–533.

138. Gilbert, K.M., Schaeffer, D.J., Gati, J.S., Klassen, L.M., *Everling, S.,* & **Menon, R.S.** (2019) Open-source hardware designs for MRI of mice, rats, and marmosets: Integrated animal holders and radiofrequency coils. *J Neurosci Methods*, **312**, 65–72.

139. Connell, I.R.O. & **Menon, R.S.** (2019) Shape Optimization of an Electric Dipole Array for 7 Tesla Neuroimaging. *IEEE Trans Med Imaging*, **38**, 2177–2187.

140. Zhang, K.M., Prior, P.L., Swartzman, L.C., Suskin, N., Unsworth, K.L., & **Minda, J.P.** (2019) Can causal explanations about endothelial pathophysiology benefit patient education? A cluster randomized controlled trial in cardiac rehabilitation. *Patient Educ Couns*, **102**, 1672–1679.

141. Nielsen, E. & **Minda, J.** (2019) Problem Solving and Decision Making. *Psychology Publications*. In Dana S. Dunn (Ed.). Oxford Bibliographies in Psychology. New York: Oxford University Press.

142. Roach, V.A., Fraser, G.M., Kryklywy, J.H., **Mitchell, D.G.,** & Wilson, T.D. (2019) Guiding low spatial ability individuals through visual cueing: The dual importance of where and when to look. *Anatomical sciences education*, **12**, 32–42.

143. Tavares, T.P., **Mitchell, D.G.V.,** Coleman, K., Shoesmith, C., Bartha, R., Cash, D.M., Moore, K.M., van Swieten, J., Borroni, B., Galimberti, D., Tartaglia, M.C., Rowe, J., Graff, C., Tagliavini, F., Frisoni, G., Cappa, S., Laforce, R., de Mendonça, A., Sorbi, S., Wallstrom, G., Masellis, M., Rohrer, J.D., Finger, E.C., & Genetic FTD Initiative, GENFI (2019) Ventricular volume expansion in presymptomatic genetic frontotemporal dementia. *Neurology*, **93**, e1699–e1706.

144. El-Baba, M., Lewis, D.J., Fang, Z., *Owen, A.M.,* Fogel, S.M., & **Morton, J.B.** (2019) Functional connectivity dynamics slow with descent from wakefulness to sleep. *PLoS One*, **14**, e0224669.

145. Rajaei, K., **Mohsenzadeh, Y.,** Ebrahimpour, R., & Khaligh-Razavi, S.-M. (2019) Beyond core object recognition: Recurrent processes account for object recognition under occlusion. *PLoS Comput Biol*, **15**, e1007001.

146. Jaegle, A., Mehrpour, V., **Mohsenzadeh, Y.,** Meyer, T., Oliva, A., & Rust, N. (2019) Population response magnitude variation in inferotemporal cortex predicts image memorability. *Elife*, **8**.

147. **Mohsenzadeh, Y.,** Mullin, C., Lahner, B., Cichy, R.M., & Oliva, A. (2019) Reliability and Generalizability of Similarity-Based Fusion of MEG and fMRI Data in Human Ventral and Dorsal Visual Streams. *Vision (Basel)*, **3**.

148. **Mohsenzadeh, Y.,** Mullin, C., Oliva, A., & Pantazis, D. (2019) The perceptual neural trace of memorable unseen scenes. *Sci Rep*, **9**, 6033.

149. Basti, A., **Mur, M.,** Kriegeskorte, N., Pizzella, V., Marzetti, L., & Hauk, O. (2019) Analysing linear multivariate pattern transformations in neuroimaging data. *PLoS One*, **14**, e0223660.

150. Henriksson, L., **Mur, M.,** & Kriegeskorte, N. (2019) Rapid Invariant Encoding of Scene Layout in Human OPA. *Neuron*, **103**, 161-171.e3.

151. Fang, Z., Ray, L.B., **Owen, A.M.,** & Fogel, S.M. (2019) Brain Activation Time-Locked to Sleep Spindles Associated With Human Cognitive Abilities. *Front Neurosci*, **13**, 46.

152. Peterson, A. & **Owen, A.M.** (2019) Confronting the grey zone after severe brain injury. *Emerging Topics in Life Sciences*, **3**, 707–711.

153. Luppi, A.I., Craig, M.M., Pappas, I., Finoia, P., Williams, G.B., Allanson, J., Pickard, J.D., **Owen, A.M.,** Naci, L., Menon, D.K., & Stamatakis, E.A. (2019a) Consciousness-specific dynamic interactions of brain integration and functional diversity. *Nat Commun*, **10**, 4616.

154. Hodgson, T.L., Hermens, F., Pennington, K., Pickering, J.S., Ezard, G., Clarke, R., Sharma, J., & **Owen, A.M.** (2019) Eye Movements in the "Morris Maze" Spatial Working Memory Task Reveal Deficits in Strategic Planning. *J Cogn Neurosci*, **31**, 497–509.

155. Honarmand, K., Malik, S., Wild, C., Gonzalez-Lara, L.E., McIntyre, C.W., **Owen, A.M.,** & Slessarev, M. (2019) Feasibility of a web-based neurocognitive battery for assessing cognitive function in critical illness survivors. *PLoS One*, **14**, e0215203.

156. Demertzi, A., Tagliazucchi, E., Dehaene, S., Deco, G., Barttfeld, P., Raimondo, F., Martial, C., Fernández-Espejo, D., Rohaut, B., Voss, H.U., Schiff, N.D., **Owen, A.M.,** Laureys, S., Naccache, L., & Sitt, J.D. (2019) Human consciousness is supported by dynamic complex patterns of brain signal coordination. *Science Advances*, **5**, eaat7603.

157. Bruni, T., Graham, M., Norton, L., Gofton, T., **Owen, A.M.,** & Weijer, C. (2019) Informed consent for functional MRI research on comatose patients following severe brain injury: balancing the social benefits of research against patient autonomy. *J Med Ethics*, **45**, 299–303.

158. van den Berg, N.H., Al-Kuwatli, J., Paulin, J., Ray, L.B., **Owen, A.M.,** & Fogel, S.M. (2019) Sleep preferentially enhances memory for a cognitive strategy but not the implicit motor skills used to acquire it. *Neurobiology of Learning and Memory*, **161**, 135–142.

159. Stojanoski, B., Benoit, A., Van Den Berg, N., Ray, L.B., **Owen, A.M.,** Shahidi Zandi, A., Quddus, A., Comeau, F.J.E., & Fogel, S.M. (2019) Sustained vigilance is negatively affected by mild and acute sleep loss reflected by reduced capacity for decision making, motor preparation, and execution. *Sleep*, **42**.

160. Stafford, C.A., **Owen, A.M.,** & Fernández-Espejo, D. (2019) The neural basis of external responsiveness in prolonged disorders of consciousness. *Neuroimage Clin*, **22**, 101791.

161. Owen, A.M. (2019) The Search for Consciousness. *Neuron*, **102**, 526–528.

162. Sternin, A., Burns, A., & **Owen, A.M.** (2019) Thirty-Five Years of Computerized Cognitive Assessment of Aging-Where Are We Now? *Diagnostics (Basel)*, **9**.

163. Houldin, E., Fang, Z., Ray, L.B., **Owen, A.M.,** & Fogel, S.M. (2019) Toward a complete taxonomy of resting state networks across wakefulness and sleep: an assessment of spatially distinct resting state networks using independent component analysis. *Sleep*, **42**.

164. Tung, J., Speechley, K.N., Gofton, T., Gonzalez-Lara, L.E., Graham, M., Naci, L., Peterson, A.H., **Owen, A.M.,** & Weijer, C. (2019) Towards the assessment of quality of life in patients with disorders of consciousness. *Quality of Life Research*, 1–11.

165. Michel, M., Beck, D., Block, N., Blumenfeld, H., Brown, R., Carmel, D., Carrasco, M., Chirimuuta, M., Chun, M., Cleeremans, A., Dehaene, S., Fleming, S.M., Frith, C., Haggard, P., He, B.J., Heyes, C., Goodale, M.A., Irvine, L., Kawato, M., Kentridge, R., King, J.-R., Knight, R.T., Kouider, S., Lamme, V., Lamy, D., Lau, H., Laureys, S., LeDoux, J., Lin, Y.-T., Liu, K., Macknik, S.L., Martinez-Conde, S., Mashour, G.A., Melloni, L., Miracchi, L., Mylopoulos, M., Naccache, L., **Owen, A.M.,** Passingham, R.E., Pessoa, L., Peters, M.A.K., Rahnev, D., Ro, T., Rosenthal, D., Sasaki, Y., Sergent, C., Solovey, G., Schiff, N.D., Seth, A., Tallon-Baudry, C., Tamietto, M., Tong, F., van Gaal, S., Vlassova, A., Watanabe, T., Weisberg, J., Yan, K., & Yoshida, M. (2019) Opportunities and challenges for a maturing science of consciousness. *Nat Hum Behav*, **3**, 104–107.

166. **Palaniyappan, L.,** Al-Radaideh, A., Mougin, O., Das, T., Gowland, P., & Liddle, P.F. (2019) Aberrant myelination of the cingulum and Schneiderian delusions in schizophrenia: a 7T magnetization transfer study. *Psychol Med*, **49**, 1890–1896.

167. Das, T.K., Javadzadeh, A., Dey, A., Sabesan, P., Théberge, J., Radua, J., & **Palaniyappan, L.** (2019) Antioxidant defense in schizophrenia and bipolar disorder: A meta-analysis of MRS studies of anterior cingulate glutathione. *Prog Neuropsychopharmacol Biol Psychiatry*, **91**, 94–102.

168. Luo, Q., Chen, Q., Wang, W., Desrivières, S., Quinlan, E.B., Jia, T., Macare, C., Robert, G.H., Cui, J., Guedj, M., **Palaniyappan, L.,** Kherif, F., Banaschewski, T., Bokde, A.L.W., Büchel, C., Flor, H., Frouin, V., Garavan, H., Gowland, P., Heinz, A., Ittermann, B., Martinot, J.-L., Artiges, E., Paillère-Martinot, M.-L., Nees, F., Orfanos, D.P., Poustka, L., Fröhner, J.H., Smolka, M.N., Walter, H., Whelan, R., Callicott, J.H., Mattay, V.S., Pausova, Z., Dartigues, J.-F., Tzourio, C., Crivello, F., Berman, K.F., Li, F., Paus, T., Weinberger, D.R., Murray, R.M., Schumann, G., Feng, J., & IMAGEN consortium (2019) Association of a Schizophrenia-Risk Nonsynonymous Variant With Putamen Volume in Adolescents: A Voxelwise and Genome-Wide Association Study. *JAMA Psychiatry*, **76**, 435–445.

169. Iwabuchi, S.J., Auer, D.P., Lankappa, S.T., & **Palaniyappan, L.** (2019) Baseline effective connectivity predicts response to repetitive transcranial magnetic stimulation in patients with treatment-resistant depression. *Eur Neuropsychopharmacol*, **29**, 681–690.

170. Wang, Q., Zhang, J., Liu, Z., Crow, T.J., Zhang, K., **Palaniyappan, L.,** Li, M., Zhao, L., Li, X., Deng, W., Guo, W., Ma, X., Cheng, W., Ma, L., Wan, L., Lu, G., Liu, Z., Wang, J., Feng, J., & Li, T. (2019) "Brain Connectivity Deviates by Sex and Hemisphere in the First Episode of Schizophrenia"-A Route to the Genetic Basis of Language and Psychosis? *Schizophr Bull*, **45**, 484–494.

171. Supekar, K., Cai, W., Krishnadas, R., **Palaniyappan, L.,** & Menon, V. (2019) Dysregulated Brain Dynamics in a Triple-Network Saliency Model of Schizophrenia and Its Relation to Psychosis. *Biol Psychiatry*, **85**, 60–69.

172. **Palaniyappan, L.,** Deshpande, G., Lanka, P., Rangaprakash, D., Iwabuchi, S., Francis, S., & Liddle, P.F. (2019) Effective connectivity within a triple network brain system discriminates schizophrenia spectrum disorders from psychotic bipolar disorder at the single-subject level. *Schizophr Res*, **214**, 24–33.

173. Anderson, K.K., Norman, R., MacDougall, A.G., Edwards, J., **Palaniyappan, L.,** Lau, C., & Kurdyak, P. (2019) Estimating the incidence of first-episode psychosis using population-based health administrative data to inform early psychosis intervention services. *Psychol Med*, **49**, 2091–2099.

174. Mitchell, E., Tavares, T.P., **Palaniyappan, L.,** & Finger, E.C. (2019) Hoarding and obsessive-compulsive behaviours in frontotemporal dementia: Clinical and neuroanatomic associations. *Cortex*, **121**, 443–453.

175. **Palaniyappan, L.** (2019) Inefficient neural system stabilization: a theory of spontaneous resolutions and recurrent relapses in psychosis. *J Psychiatry Neurosci*, **44**, 367–383.

176. Li, M., Li, X., Das, T.K., Deng, W., Li, Y., Zhao, L., Ma, X., Wang, Y., Yu, H., Meng, Y., Wang, Q., **Palaniyappan, L.,** & Li, T. (2019) Prognostic Utility of Multivariate Morphometry in Schizophrenia. *Front Psychiatry*, **10**, 245.

177. **Palaniyappan, L.,** Das, T.K., Winmill, L., Hough, M., & James, A. (2019) Progressive post-onset reorganisation of MRI-derived cortical thickness in adolescents with schizophrenia. *Schizophr Res*, **208**, 477–478.

178. **Palaniyappan, L.,** Batty, M.J., Liddle, P.F., Liddle, E.B., Groom, M.J., Hollis, C., & Scerif, G. (2019) Reduced Prefrontal Gyrification in Carriers of the Dopamine D4 Receptor 7-Repeat Allele With Attention Deficit/Hyperactivity Disorder: A Preliminary Report. *Front Psychiatry*, **10**, 235.

179. Peckham, S.B., Ionson, E., Nassim, M., Ojha, K., **Palaniyappan, L.,** Gati, J., Thebérge, J., Lazosky, A., Speechley, M., Barušs, I., Rej, S., & Vasudev, A. (2019) Sahaj Samadhi meditation vs a Health Enhancement Program in improving late-life depression severity and executive function: study protocol for a two-site, randomized controlled trial. *Trials*, **20**, 605.

180. **Palaniyappan, L.,** Mota, N.B., Oowise, S., Balain, V., Copelli, M., Ribeiro, S., & Liddle, P.F. (2019) Speech structure links the neural and socio-behavioural correlates of psychotic disorders. *Prog Neuropsychopharmacol Biol Psychiatry*, **88**, 112–120.

181. **Palaniyappan, L.,** Hodgson, O., Balain, V., Iwabuchi, S., Gowland, P., & Liddle, P. (2019) Structural covariance and cortical reorganisation in schizophrenia: a MRI-based morphometric study. *Psychol Med*, **49**, 412–420.

182. Edwards, J., Norman, R., Kurdyak, P., MacDougall, A.G., **Palaniyappan, L.,** Lau, C., & Anderson, K.K. (2019) Unmet need for mental health services among people screened but not admitted to an early psychosis intervention program. *Schizophr Res*, **204**, 55–57.

183. Reschechtko, S., Johansson, A.S., & **Andrew Pruszynski, J.** (2019) Maintaining arm control during self-triggered and unpredictable unloading perturbations. *Eur J Neurosci*, **50**, 3531–3543.

184. Chambers, C.D., Forstmann, B., & **Pruszynski, J.A.** (2019) Science in flux: Registered reports and beyond at the European Journal of Neuroscience. *Eur J Neurosci*, **49**, 4–5.

185. Weiler, J., *Gribble, P.L.,* & **Pruszynski, J.A.** (2019) Spinal stretch reflexes support efficient hand control. *Nat Neurosci*, **22**, 529–533.

186. **Pruszynski, J.A.** & Zylberberg, J. (2019) The language of the brain: real-world neural population codes. *Curr Opin Neurobiol*, **58**, 30–36.

187. Heath, C.J., O'Callaghan, C., Mason, S.L., Phillips, B.U., **Saksida, L.M.,** Robbins, T.W., Barker, R.A., *Bussey, T.J.,* & Sahakian, B.J. (2019) A Touchscreen Motivation Assessment Evaluated in Huntington's Disease Patients and R6/1 Model Mice. *Front Neurol*, **10**, 858.

188. Janickova, H., Kljakic, O., Rosborough, K., Raulic, S., Matovic, S., Gros, R., **Saksida, L.M.,** *Bussey, T.J.,* Inoue, W., Prado, V.F., & Prado, M.A.M. (2019) Selective decrease of cholinergic signaling from pedunculopontine and laterodorsal tegmental nuclei has little impact on cognition but markedly increases susceptibility to stress. *FASEB J*, **33**, 7018–7036.

189. Reichelt, A.C., Hare, D.J., *Bussey, T.J.,* & **Saksida, L.M.** (2019) Perineuronal Nets: Plasticity, Protection, and Therapeutic Potential. *Trends Neurosci*, **42**, 458–470.

190. Deweyert, A., Iredale, E., Xu, H., Wong, E., **Schmid, S.,** & Hebb, M.O. (2019) Diffuse intrinsic pontine glioma cells are vulnerable to low intensity electric fields delivered by intratumoral modulation therapy. *J Neurooncol*, **143**, 49–56.

191. Moszczynski, A., Fulcher, N., McCunn, P., Volkening, K., DeOliveira, C., **Schmid, S.,** *Bartha, R.,* Strong, M., & Harvey, M. (2019) Synergistic neuropathology resulting from co-expression of TDP-43 and tau protein in vivo. *Neurology*, **92**.

192. **Sherry, D.F.** & Guigueno, M.F. (2019) Cognition and the brain of brood parasitic cowbirds. *Integr Zool*, **14**, 145–157.

193. Martin, R.J. & **Sherry, D.F.** (2019) Overwinter temperature has no effect on problem solving abilities or responses to novelty in Black-capped Chickadees (Poecile atricapillus). *Behav Processes*, **162**, 72–78.

194. Riganello, F., Prada, V., **Soddu, A.,** di Perri, C., & Sannita, W.G. (2019) Circadian Rhythms and Measures of CNS/Autonomic Interaction. *International Journal of Environmental Research and Public Health*, **16**, 2336.

195. Riganello, F., Napoletano, G., Cortese, M.D., Arcuri, F., Solano, A., Lucca, L.F., Tonin, P., & **Soddu, A.** (2019) What impact can hospitalization environment produce on the ANS functioning in patients with Unresponsive Wakefulness Syndrome? – 24-hour monitoring. *Brain Injury*, **33**, 1347–1353.

196. Kandeepan, S., Maudoux, A., Ribeiro de Paula, D., Zheng, J.Y., Cabay, J.E., Gómez, F., Chronik, B.A., Ridder, D., Vanneste, S., & Soddu, A. (2019) Tinnitus distress: a paradoxical attention to the sound? *J Neurol*, **266**, 2197–2207.

197. Rafat, Y. & **Stevenson, R.A.** (2019) Auditory-orthographic integration at the onset of L2 speech acquisition. *Lang Speech*, **62**, 427–451.

198. Feldman, J.I., Kuang, W., Conrad, J.G., Tu, A., Santapuram, P., Simon, D.M., Foss-Feig, J.H., Kwakye, L.D., **Stevenson, R.A.,** Wallace, M.T., & Woynaroski, T.G. (2019) Brief Report: Differences in Multisensory Integration Covary with Sensory Responsiveness in Children with and without Autism Spectrum Disorder. *J Autism Dev Disord*, **49**, 397–403.

199. Schulz, S.E. & **Stevenson, R.A.** (2019) Sensory hypersensitivity predicts repetitive behaviours in autistic and typically-developing children. *Autism*, **23**, 1028–1041.

200. Zhou, Z., **Vilis, T.,** & Strother, L. (2019) Functionally Separable Font-invariant and Font-sensitive Neural Populations in Occipitotemporal Cortex. *J Cogn Neurosci*, **31**, 1018–1029.

All peer-reviewed publications listed above were submitted by BMI core members. Publications and other research details about both core and associate members at the Brain and Mind Institute can be found at: https://www.uwo.ca/bmi/investigators/index.html.

BMI Annual Report

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