



Western BrainsCAN

Transforming brain research.

HUMAN COGNITION & SENSORIMOTOR CORE

COGNITIVE NEUROSCIENCE

Disorders that affect human brain function have a profound impact on how we perceive the world, make sense of what we see and hear, remember the past, plan for the future, communicate our thoughts to others, choose goals, plan actions and carry these actions out. Rigorous assessment of these aspects of cognition and behaviour is therefore critical to the development of an understanding of brain disorders. These cognitive and behavioural data can then be combined with circuit-level data obtained via other approaches—including neuroimaging, animal models and computational models—to build a complete picture of 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.

HUMAN COGNITION & SENSORIMOTOR CORE

The Human Cognition & Sensorimotor Core (HCS) provides state-of-the-art equipment and testing space in the Brain and Mind Institute (BMI, www.uwo.ca/bmi), located in the Western Interdisciplinary Research Building, for measuring cognitive abilities, emotional and social behaviour, psychophysics and sensorimotor performance in neurotypical and neurologically-impaired individuals throughout the lifespan. Resources include motion-tracking devices for measuring both the kinematics of skilled manual movements and the forces deployed when grasping and manipulating objects. There are also several robotic setups, including robotic arms, which are designed to investigate human motor behaviour. By simulating novel objects or dynamic environments, investigators can study how the brain recalibrates well-learned motor skills or acquires new ones. The HCS Core also provides access to eye movement recording, a gait laboratory, a driving simulator, a VR laboratory, equipment for measuring speech and auditory processing, a 5-bedroom sleep laboratory, a human microneurography laboratory, child and infant observation and testing rooms, and a range of other specialized facilities for measuring human cognition and sensorimotor performance.

In addition to equipment, HCS Core provides access to technicians and other personnel with expertise in computer programming, data analysis, design and fabrication of specialized equipment, recruitment of participants, including from special populations, and the development of databases.

Further information on BrainsCAN research can be found at brainscan.uwo.ca

Accelerator Projects

Neurocognitive, genetic and environmental risk factors of learning disorders in children
Joanisse, Marc

System-wide electrophysiological assessment of hearing
Johnsrude, Ingrid

Protecting against hemodialysis induced neuro-cognitive injury
McIntyre, Arthur

The impact of violent gaming on the brain as a function of individual differences in trait empathy
Mitchell, Derek

The BrainsCAN Human Cognition & Sensorimotor Core is part of Western's \$66M BrainsCAN initiative, supported by the Canada First Research Excellence Fund (CFREF). The CFREF investment enables researchers at the University, along with their national and international academic and commercial partners, to seek answers to fundamental questions regarding how we learn, think, move and communicate.



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