

## AT A GLANCE

### DISCIPLINES

Psychological Science  
Neuroscience (collaborative with Biological Sciences)  
Mental Health Studies (2009)  
Clinical Psychology (MA/PhD)\*  
Neuroimaging Technologies (MSc)\*

\* proposed for 2011

### RESEARCH STRENGTHS

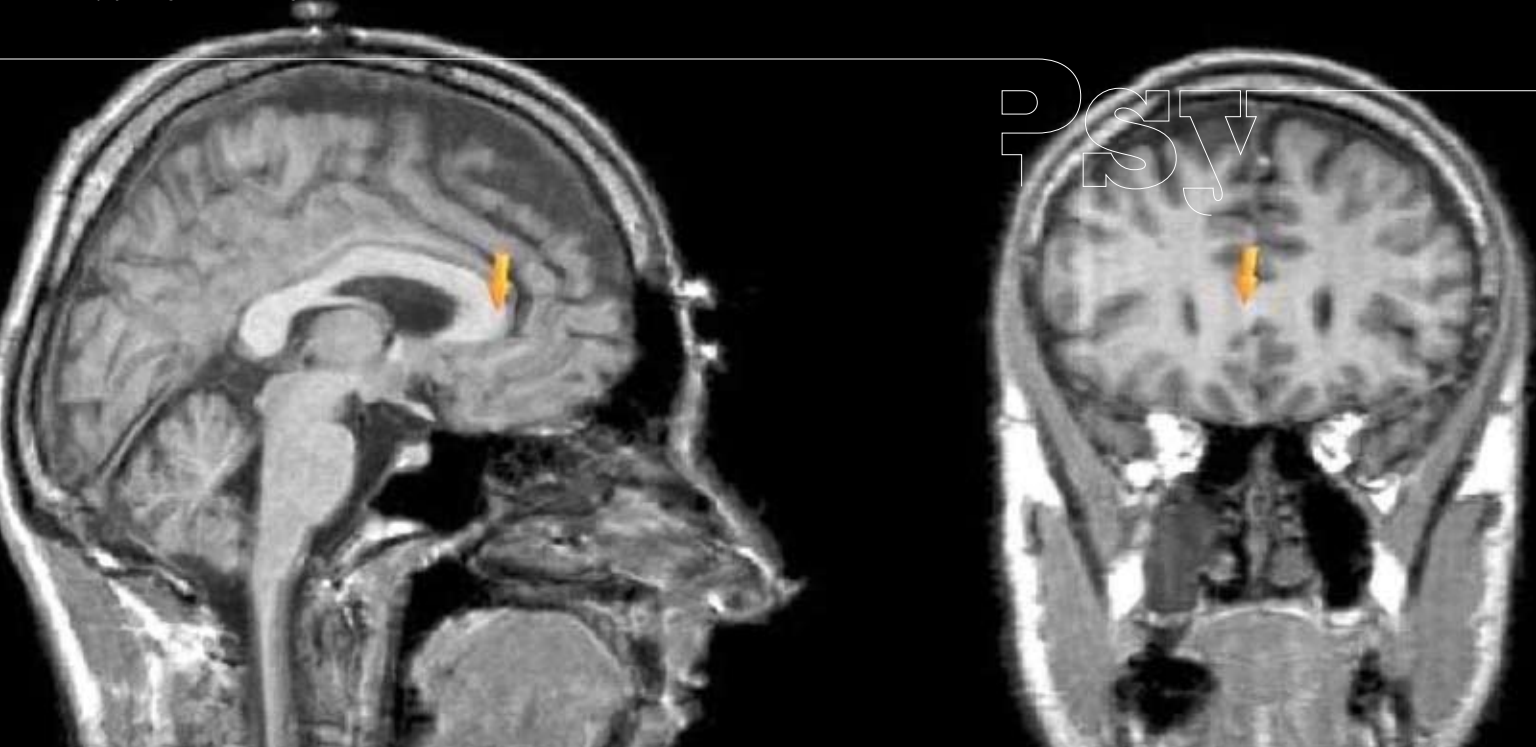
*Cognitive, Social & Affective Neuroscience  
(including Neuroimaging Technologies)*  
*Computational Cognition*  
*Lifespan Development*  
*Social & Personality Psychology*  
*Mental Health*

**36**

**Think:**  
*Frontiers*

# Psychology

UTSC psychologists are using cutting-edge technology such as neuroimaging to gain deeper insights into the human brain and psychological functioning.



**The study of the human mind in all its aspects is active at the University of Toronto Scarborough – social, personality, abnormal, developmental, cognitive and perceptual psychology – and extends into the neural dimension. Neuroscience is one of the Department of Psychology’s research strengths and it is matched by teaching excellence that brings students to the forefront of psychology’s newest frontiers.**

#### **The Psychology Department at UTSC**

is involved in leading research, with faculty working in many current and emerging fields of study. One cluster is focused on computational approaches to cognition, which adds a theoretical perspective to enrich the department’s functional neuroscience endeavours. Other clusters involve developmental phenomena, social and personality psychology, and mental health. Our highly regarded scientists are also using neuroimaging technologies to investigate how the human brain works.

In recent years, the Psychology Department has grown significantly, with four ongoing searches promising to further enhance the faculty. As measured by faculty numbers, the size of the Scarborough department is considerable, equaling the size of the departments at the St. George and Mississauga campuses. All UTSC faculty participate in U of T’s graduate programs.

Our strong faculty have earned many accolades in teaching and research. John Kennedy is a Fellow of the Royal Society of Canada and Laura-Ann Petitto has been elected a Fellow of the American Association for the Advancement of Science. They have both been invited to centres for advanced studies – Petitto at Stanford and Kennedy at Berlin. Suzanne Erb won a Governor General of Canada’s Gold Medal.

Besides the increasing number of students who enrol in psychology courses, there are other indicators of teaching excellence at UTSC. Most dramatic is the success of the Psychology

faculty at TVO’s *Best Lecturer Competition* in the past three years. Steve Joordens and Marc Fournier (with Biology professor Maydianne Andrade) made the competition’s list of top 10 finalists in 2007, and Fournier and Gerry Cupchik made the list in 2008. What is remarkable about the 2008 achievement is that both UTSC lecturers were the only faculty to finish in the top 10 from the entire University of Toronto system. The success continues, with 12 faculty members from UTSC – 7 of them from the Psychology Department – nominated for the first round of the 2009 competition.

Currency in new and emerging fields of study is also central to our development of programs, including our proposed courses in Mental Health Studies and a leading-edge Master’s and PhD programs in Clinical Psychology, all based at UTSC.

As one of the primary factors impacting disability, mental health is a vital concern in today’s society but traditionally also a taboo subject, which was evidenced by a series of stories published recently in *The Globe and Mail*. Perceived as instrumental in “outing” this health challenge, the series has helped promote the importance of mental health, while heightened public awareness of the issue has resulted in an increasing number of students pursuing psychology as their field of study.

Traditional psychology was about therapy and interpersonal supports that helped patients deal with life and social stresses. This approach is now complemented by >

## Mapping science's new frontier – the brain

As an undergraduate, Laura-Ann Petitto conducted research with a chimpanzee in an attempt to teach him sign language, and ever since has had a career-long fascination with language. Her current research project at UTSC, however, studies not just language development but also the neural tissue that makes human language possible. It also has an impact on aspects as diverse as dyslexia and bilingualism.

Petitto – the senior scientist of UTSC's Genes, Mind & fNIRS Brain Imaging Laboratory for Language,

Bilingualism and Child Development – uses cutting-edge technology to map brain activity. Says Petitto: "With new neuroimaging technologies and new methods to associate clusters of genes with their regulatory role in parts of the human brain, we have the capacity to look inside a living human brain and to study many clusters of genes in relation to the brain and its higher cognitive functions, such as language, and executive functions, such as attention and memory."

The technology at the centre of Petitto's lab is a functional near-infrared spectroscopy (fNIRS), which utilizes light to detect changes in blood flow in the brain. Small, portable, silent and less costly than an fMRI (functional magnetic resonance imaging), fNIRS is also more tolerant of movement, thereby permitting participants to do a fuller range of more natural activities such as talking and writing while undergoing brain imaging.

Psychology Professor Laura-Ann Petitto uses functional near-infrared spectroscopy (fNIRS) for her research. The high-tech method utilizes light to detect changes in the brain's blood flow and map brain activity.



psychopharmacological and neuroscience approaches to understand the mechanisms of the brain.

Our programs at UTSC will offer a balance – and a choice. This dual focus on psychobiological and psychosocial factors will position our programs at the leading edge of education in the field. Another exciting new direction for psychology is neuroimaging technology – the use of technology to monitor brain activity. These new programs will enhance our strength in cognitive, affective and social neuroscience, as well as in social and developmental psychology and in "wet" neuroscience.

Several of our researchers are using these tools to investigate higher-order cognition in addition to social and affective phenomena. Linking human phenomena to brain activity gives much deeper insights into psychological functioning.

Our labs are home to a functional near-infrared spectroscopy (fNIRS) recorder, electroencephalography (EEG) installations and electrophysiology systems that monitor neural and autonomic activity concurrently. One of our labs has a virtual-reality installation; another has an installation for visual-perception research that includes an eye tracker.

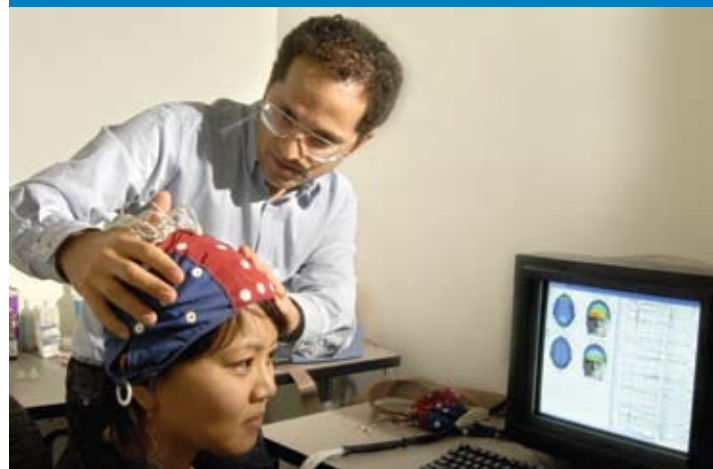
While neuroimaging has become the method of choice for neuroscience research, very few programs provide focused professional training in imaging technologies. At UTSC, we are developing another graduate program centred on imaging technologies.

While the requirements for this – and for our Clinical Psychology graduate programs – have not yet been fully laid out, we know that the training will be multifaceted. Departmental strengths such as computational modelling, a relevant tool for theorizing about neural data, will be part of the course.

These are exceptional times for psychology, both as a department and as a field. Gaining autonomy in 2007 has galvanized our planning for the next five years. We are confident that these plans, once achieved, will benefit students, staff and faculty and will contribute to the growing success of UTSC. •

Psychology Professor Michael Inzlicht studies the biological bases of racism and the brain's mirror neuron system to examine how it affects the way people perceive others from different ethnic groups.

## Decoding the mind of prejudice



## High-tech learning with personal impact

The most popular first-year course at UTSC is Introductory Psychology, which is taken by 70 percent of students – as many as 1,500 all at once. The popularity

of this course poses challenges, not the least being the need to engage students in a large-class context.

Professor Steve Joordens succeeds in this area on a number of fronts. He's a three-time contender in TVO's *Best Lecturer Competition* – twice, including 2008, in the top 20.

"Students can view textbook material as dry. I try to make it relevant to their lives," explains Joordens. "To illustrate reinforcement and conditioning, for example, I use the idea of flirting: Should a girl smile each time a guy flirts with her? This makes an abstract concept real. Students respond to it."

From his background – in cognition and memory – Joordens has branched into the use of technology in learning. He and his team were among the first to employ webOption courses, applying rigorous methodologies to ensure that learning is not eroded.

Introductory Psychology is taught to 500 students in a classroom setting and to 1,000 others through webOption. Originally conceived by Dr. John Bassili, Chair of the Psychology Department at UTSC, the online alternative is preferred by students because of its flexibility. It allows them to watch a lecture – and to pause and rewind – at any time. This year, up to 30 UTSC courses are available to students via webOption.

Joordens also enjoys success with his Internet-based peer-Scholar program, which supports his belief that teaching should foster critical thinking. By engaging students in peer reviewing each other's work, this technology provides an active learning experience. Students submit their essays online, and then evaluate and comment on six other anonymous submissions on the same topic. As they assess their peers' work, their own essays are being marked by six other students.

Now in use at UTSC for seven years, peerScholar was recently licensed by Pearson Education Canada, which will distribute the program across North America in January 2009.



Professor Steve Joordens is skilled at delivering high-powered lectures and using technology, so that even in large classes, such as Introductory Psychology, students get the most out of their learning.

For those who think prejudice is dead in egalitarian countries such as Canada, UTSC psychology professor Michael Inzlicht responds: Racism is alive and well. It has simply mutated.

Its most subtle form is "implicit racism" – the unconscious attitudes of even those who consider themselves consciously unbiased. This type of racism is difficult to measure in the lab because people may be unaware of their biases or want to hide them.

Exploring a new area in psychology, Inzlicht's groundbreaking research on prejudice focuses on the role of mirror neurons – a system of brain cells considered to be involved in triggering feelings of empathy – which activate when a person

performs certain acts and also when that person observes other people performing the same acts.

Does implicit racism exist and, if so, is it possible to change the brain's hardwiring? In attempting to answer that question, Inzlicht and his team record the brain activity of people watching videos of others performing simple actions. The goal is to see if our mirror-neuron system activates when we watch those who look like us (our in-group) versus those unlike us (our out-group). If his hypothesis proves true – that there is less mirror-neuron activity with out-group than with in-group members – then the evidence would suggest that empathy with our in-group is hard-wired in our brains.

Still, this does not mean that prejudice is unavoidable. In researching gender prejudice, for example, Inzlicht has found that women who work in mathematics and sciences in Eastern Europe don't experience negative stereotyping as their counterparts do in the West. "If environmental influences affect how we perceive others and how we behave – and they do – environment can change the very expression of our genes," he says.