

Established McGill cognitive science researchers

To help guide students to appropriate research supervisors, we list here some McGill professors, with their permission, who exemplify the ability and inclination to supervise undergraduate cognitive science research. We will extend this list based on positive experience.

Researcher	Research Summary
Luis Alonso-Ovalle, Linguistics	Formal semantics and pragmatics, modality, implicatures.
Jorge Armony, Psychiatry, Psychology	Neural bases of emotional processing and its interactions with other cognitive systems, such as attention, memory and decision-making. Studies are conducted in healthy individuals as well as in neurological and psychiatric populations using a variety of techniques, including functional and structural magnetic resonance imaging.
Curtis Baker, Ophthalmology, Biomedical Engineering, Physiology, Experimental Medicine, Neurology and Neurosurgery	Neural mechanisms underlying visual perception of figure-ground boundaries in natural images are studied using neurophysiological, optical imaging, psychophysical, and computational approaches
Shari Baum, Communication Sciences and Disorders	The neural bases of speech and language processing through studies of individuals with focal brain lesions, functional neuroimaging, and electrophysiological measures. Specific interests in speech prosody, speech motor control, lexical and sentence processing, bilingualism and neuroplasticity.
Veronique Bohbot, Psychiatry	Plasticity in the human hippocampus and neocortex resulting from spatial memory cognitive training. Spatial Representations in Multiple Memory Systems with functional and structural neuroimaging. Protective effects of spatial memory in normal aging, neurological and psychiatric diseases.
Mark Brandon, Psychiatry	Use of in vivo electrophysiology and optogenetics to study the spatial coding of grid cells, head direction cells, place cells; and how these neurons contribute to memory. The lab is also interested in the computational role of oscillations and interneurons in entorhinal and hippocampal function.
Jonathan Britt, Psychology	The neural circuitry underlying motivated behaviors relevant to reward learning and drug addiction. Electrophysiological and optogenetic techniques are combined with various behavioral tasks to identify the precise neural circuits and synaptic modifications that support compulsive behavior. The emphasis is on dopaminergic regulation of neural processing in the nucleus accumbens.
Jackie C.K. Cheung, Computer Science	Natural language processing.
Meghan Clayards, Linguistics, Communication Sciences and Disorders	Speech perception and production, second language learning, cognitive ageing, executive function.
David Davies, Philosophy	Metaphysical and epistemological issues in the Philosophy of Art. Art and Cognitive Neuroscience. Philosophy of Mind.
Etienne de Villers-Sidani, Neurology and Neurosurgery	Understanding how brain circuits are shaped by sensory experience and behavior. Intracortical recordings in awake behaving or anesthetized rat cortex to examine the impact of various sound exposures and auditory training on cortical maps and behavior at different stages of the life cycle (early development, adulthood, aging). The ultimate objective is to understand the role of brain activity in the emergence and remediation of cognitive impairments and to develop novel neuroplasticity-based therapeutic strategies to improve the cognitive function of patients suffering from

	condition related to abnormal sensori-motor processing---dementia, age-related cognitive decline, stroke, traumatic brain injuries, among other conditions.
Bruno Debruille, Psychiatry	Consciousness, schizophrenia, cognitive processes, semantics, high temporal resolution functional brain imaging: event-related brain potentials (ERPs). Focus on brain activities induced by socially meaningful stimuli, such as faces and words. Functional significance of the N400 potential and of the frontal positivity.
Lesley Fellows, Neurology and Neurosurgery, Psychology	Cognitive neuroscience, Decision neuroscience, Neuroeconomics, Reward processing, Emotion regulation. Frontal lobe functions. Cognitive/behavioural neurology. Executive function. HIV-associated neurocognitive disorders. Mild cognitive impairment. Dementia.
Brendan Gillon, Linguistics	Natural language semantics: how words behave like the predicates of logic (known in linguistics as argument structure), the distinction between count nouns (e.g., suggestions) and mass nouns (e.g., advice); as well as logic and its history.
Heather Goad, Linguistics	Phonology and language acquisition. Examining how representations can inform our understanding of the shapes of phonological systems and the developmental trajectory of first and second language learners.
Ian Gold, Philosophy	Delusion in psychiatric and neurological illness. Reductionism in psychiatry and neuroscience.
Steven Harnad, Psychology	Mechanisms of (1) category learning, (2) categorical perception, (3) language and (4) voluntary movement in humans. The methods used are behavioral, electrophysiological (Event Related Potentials (ERPs) recorded at the surface of the scalp) and computational modeling (neural nets). Also supervising (non-laboratory) projects on animal sentience.
Oliver Hardt, Psychology	Neurobiology of memory maintenance and forgetting. Pharmacologically manipulated neurons in specific brain areas in rodents, and memory assessments in humans. Dysfunctions of memory processes in conditions such as Fragile X, autism, and Alzheimer's disease.
Sherif Karama, Psychiatry	Examining the environmental and genetic influence on brain development and their corollary consequences on cognitive ability development and changes across the lifespan.
Denise Klein, Neurology and Neurosurgery	The neural substrates of unilingual and bilingual speech processing: Cross-linguistic studies of tone perception; Articulatory processes involved in speaking native and second languages; Investigation of the neural substrates of language in patients with typical and atypical patterns of hemispheric dominance for language and with different types of brain lesions. The work involves combining behavioural data with a range of brain imaging techniques (fMRI, resting-state MRI, anatomical MRI).
Michael Langer, Computer Science	Computational modelling of 3D visual perception. Methods include human psychophysics, computer vision, and computer graphics.
Eric Lewis, Philosophy	Philosophy of music and aesthetics, interdisciplinary approaches to art, culture and society.
Bratislav Mistic, Neurology and Neurosurgery	How cognitive operations and complex behaviour emerge from the connections and interactions among brain areas. Effects of disease on brain structure and function. Network science, dynamical systems and multivariate statistics, with a focus on complex data sets involving neuroimaging, including fMRI, DWI, M/EEG and PET.
Tim O'Donnell, Linguistics	Computational and mathematical linguistics, computational cognitive science, artificial Intelligence, probabilistic Inference.

Kristine Onishi, Psychology	Cognitive development and language acquisition in infants and adults; learning about sound structures; infants understanding of others' actions.
David Ostry, Psychology	Speech production and human arm movement are studied using mathematical models, robots and behavioral and physiological techniques; understanding how motor learning and adaptation affect sensory function in speech and limb movement.
Ross Otto, Psychology	Human decision making using a combination of computational, behavioral, psychophysiological, and neuroimaging techniques.
Caroline Palmer, Psychology	Brain-behavior foundations of complex auditory processing, including speech and music. Computational models of temporal coordination in individuals and groups.
Marc Pell, Communication Sciences and Disorders	Vocal emotion processing in speech; nonverbal communication; social neuroscience; effects of brain damage on communication and emotion; cultural influences on emotion processing.
David Ragsdale, Neurology and Neurosurgery, Physiology	Structure and function of membrane ion channels. How the brain makes decisions and how our understanding of this process affects our views on moral and legal accountability. Trust, from molecules to social institutions.
Natasha Rajah, Psychiatry, Psychology	The cognitive neuroscience of memory, aging and dementia prevention. Use of structural and functional magnetic resonance imaging (MRI) methods and univariate and multivariate image analysis to investigate how specific biological and demographic variables (i.e. biological sex, genetics, family history of illness, bilingualism, sex hormones) impact the integrity of the neural networks mediating episodic memory function in young, middle-aged and older adults.
Jelena Ristic, Psychology	Basic mechanisms of human attention; cognitive neuroscience of attention; social cognition, social attention, and attentional development; special populations; functional neuroimaging.
Mathieu Roy, Psychology	How the brain encodes the subjective experience of pain using a variety of psychophysiological and brain imaging techniques (skin conductance, reflexes, EEG, fMRI). How is pain affected by prior expectations and ongoing emotional states? Why do some people experience more pain than others, and why does sometimes pain seem to endure despite the absence of peripheral injury?
Jon Sakata, Biology	Behavioral, neurophysiological, and molecular investigation of the mechanisms underlying vocal learning and memory, using songbirds as my model system.
Dirk Schlimm, Philosophy, Computer Science	History and philosophy of mathematics and science, epistemology, and cognitive science. Axiomatics, analogical reasoning, concept formation, empiricism in mathematics, the use of notation, and theory development.
Signy Sheldon, Psychology	Memory for events and episodes. Behavioural experiments, work with patient populations and neuroimaging techniques to discover (1) the role of the hippocampus and related brain structures in storing and retrieving episodic memories, (2) the functions of remembering by examining how memory processes contribute to non-mnemonic abilities, like imagination and problem solving, and (3) how individual differences in the way we remember are reflected in the brain.
Junko Shimoyama, Linguistics	Sentence structure (syntax) of natural language, typically relying on evidence from interpretation (semantics).
Thomas Shultz, Psychology, Computer Science	Decision making, memory, learning, development, and evolution. Computational and mathematical modeling, behavioural experiments. Neural network and agent-based computer simulations and math models.
Morgan Sonderegger, Linguistics	Phonetic and phonological variation, speech, language change, quantitative methods, computational linguistics.

Nathan Spreng, Neurology and Neurosurgery	Large-scale brain network dynamics and their role in cognition. The link between memory, cognitive control, and social cognition and the interacting brain networks that support them. The development and implementation of multivariate and network-based statistical approaches to assess brain structure, connectivity and activity across the lifespan and dementia.
Karsten Steinhauer, Communication Sciences and Disorders	Psycholinguistics and cognitive neuroscience. Current projects investigate the neural organization and temporal online dynamics of processes underlying speech and language perception, particularly using event-related brain potentials (ERPs) and other brain imaging techniques. This includes interactions among syntactic, semantic, morphological and (overt or covert) prosodic information in listeners.
Michael Sullivan, Psychology	The psychological, biomechanical and neuroanatomical determinants of behavioural/motor alterations associated with pain.
Viviane Sziklas, Neurology and Neurosurgery, Psychology	The study of the neural correlates of cognitive processing (including verbal and nonverbal memory and higher-order behavioural management) and neuropsychological test development in epilepsy.
Eran Tal, Philosophy	Philosophy of science, measurement, epistemology, and mathematics.
Debra Titone, Psychology	The cognitive and neural bases of first and second language processing in terms of both comprehension and production. A variety of methods are used, with an emphasis on eye movement recordings. Study populations include healthy younger and older adults, and people with schizophrenia. We are particularly interested in the impact of individual differences in language experience and cognition on first and second language processing.
Joseph Vybihal, Computer Science	Intelligent software systems, including: neural networks, group robotic thinking, theory of mind, complex layered architectures, population simulations using AI agents.
Michael Wagner, Linguistics	Speech prosody as a window into grammatical, phonetic, and processing factors affecting speech production and perception.