

Desautels Faculty of Management McGill University

Decision Neuroscience (MRKT 709)

**Translational Brain-to-Society Decision and Behavior Research:
Individual Choice, Real-Time Learning and Long-Term Dynamics**

Fall 2022

Hybrid Delivery Mode

Syllabus

Course ID and Title: MRKT 709 (PhD)
Topics: Decision Neuroscience

Prerequisite: Instructor Permission

Schedule: Autumn 2022, Tuesdays 2:35-5:35

Location: In Person Room--Desautels Faculty of Management, Bronfman, Room 575
Online: <https://mcgill.zoom.us/j/86754580061?pwd=N2E1aHlGbWp1NjlQcW8wcmRWbTBuUT09>

Instructor: Laurette Dubé

of dopamine in reward learning, and the interactions between goal-directed behavior, habitual responses, impulsive drives, and, more generally, the complex and dynamic biological, social, and cultural processes that altogether define how the brain make decision.

Decision neuroscience, as taught in this seminar offered by the marketing division of the Montreal joint doctoral management program, covers the above topics, while pushing the boundaries of what behavioral and

Course Format:

The seminar is organized around the six types of decision making and behavior grouped in the BtS model, with two sessions devoted to each to cover the layers of behavioral/social sciences, neuroscience, big data/computational models, real-time/real-world choice and behavior, and the application of preceding to digital and convergent innovation as appropriate.

Each session will consist, for two-third of its time, in a live translational exercise where leading disciplinary and computational scientists are brought together for reviewing key features of their work that altogether can advance solution-oriented convergence sciences around a targeted domain where more adaptive real-time and/or long-term

Review and discussion of disciplinary papers	In pairs, one as disciplinary anchor and one provides transdisciplinary perspective (2 over the semester)	20%
Participation in class discussion	Individual	15%
Term project	Individual or in group of 2 to 3 students	40%
Final Grade		100%

Translational short essays (individual): There will be a translational short essay assignment (600-word

Session 4.
September
27th

Cue-induced/Goal-directed Decision Making and Contexts: Gene and Brain Dopamine System as Adaptive Human G*E Learning and Behavior Interface; Machine Reinforcement Learning

<https://www.dropbox.com/sh/0nvuj81dve6qafg/AAC2XcYoLvnc7Ekwxc7Nmya?dl=0>

Corbetta M, Shulman GL. Control of goal-directed and stimulus-driven attention in the brain. *Nature reviews neuroscience*. 2002 Mar;3(3):201.

Decker JH, Otto AR, Daw ND, Hartley CA. From creatures of habit to goal-directed learners: tracking the developmental emergence of model-based reinforcement learning. *Psychological science*. 2016 Jun;27(6):848-58.

Anselme P. Dopamine, motivation, and the evolutionary significance of gambling-like behaviour. *Behavioural brain research*. 2013 Nov 1;256:1-4.

Background BtS Webinars

K. Sheldon: Unconscious and Conscious Goals and Psychological Process of Choice and Learning Along the Lifecourse

https://www.mcgill.ca/desautels/files/desautels/mcche_bts-ken_sheldon_seminar-poster_panel.pdf

<https://youtu.be/32MrAjb73x0>

D. L. Schacter : Adaptive Constructive Processes in Memory, Imagination, and Creativity

<https://youtu.be/1BEVe65W0io>

J. Guibord : Investing in a Changing World: Transitioning from Traditional to Sustainable Investments (Delve Podcast)

<https://delve.mcgill.ca/watch/investing-in-a-changing-world-transitioning-from-traditional-to-sustainable>

	<p>Bengio, E., Pineau, J., & Precup, D. (2020, November). Interference and generalization in temporal difference learning. In <i>International Conference on Machine Learning</i>(pp. 767-777). PMLR.</p> <p>agency in linked socio-ecological systems, <i>Ecology and Society</i>, 18 (3), 27.</p> <p>Grievies, M. & Vickers, J. (2017). Digital twin: Mitigating unpredictable, undesirable emergent behavior in complex systems, in <i>Transdisciplinary Perspectives on Complex Systems</i>, Kahlen, F. J., Flumerfeld, S., and Alves, Ed. Springer, 2-30.</p> <p>Bahrami, F., Shahmoradi, B., Noori, J. et al (2021). Economic complexity and the dynamics of regional competitiveness: A systematic Review, <i>Competitiveness Review: An International Business Journal</i>, 1-34.</p> <p>Qi, W., Liu, J. & Christofides (2012). Hierarchical coordinate control of plug-in electric vehicles charging in multifamily dwellings, <i>IEEE Transaction on Smart Grid</i> , 5(3), 1465-1474.</p> <p>Qi, W. Distributed supervisory predictive control of distributed wind and solar energy systems, <i>IEEE Transactions on Control Systems Technology</i>, 21 (2), 504-512</p> <p>NSC MNGT</p> <p><u>Background BtS Webinars</u></p> <p><u>L. Ross: Distinction Among Causation In Neuroscience and Biology: A Theoretical Framework to Support Smart Science for Real-World Transformation</u></p> <p>https://youtu.be/UsRZKOweY7M</p> <p><u>S. Kelso: Understanding Complex Systems for Real-World Transformation: Multiscale Coordination Dynamics</u></p> <p>https://youtu.be/vl2opRmunrY</p> <p><u>K. Friston: Self-Evidencing for Individual and Collective Agency:</u></p> <p>https://youtu.be/NpdEuwZT6ow</p>	
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Session 7.
October 25th

Experience, Engagement, Affects, Emotions and Stress Behavior 1: Experience
Q8 360.65 149 0 65 494.591y nB(W* n9flt)-9(is)4(ca)-3(le)JTJETQ0 g125.78 329.33 34

Pimentel, A., Tiwari, A., & Falk, T. H. (2021). Human mental state monitoring in the wild: Are we better off with d

Krol, S. A., & Bartz, J. A. (2021). The self and empathy: Lacking a clear and stable sense of self undermines empathy and helping behavior. *Emotion*.

Identifying
being. *Journal of personality*, 85(4), 518-529.

Adler, J. M., Lodi-

Session 10.
November
15

Experience, Engagement, Affects, Emotions and Stress Behavior 2: Experience
Quality Design and Monitoring in Dynamic Physical and Digital Contexts
(surveillance/logistic/transportation)

Translational Papers

<https://www.dropbox.com/sh/8frgfjphs246qul/AADtvxaxILj0ZFpCXM35Qi4va?dl=0>

Armony, J. L. (2015). Searching for the one and many emotional brain: Comment on
Physic Life Review, 13: 31-2

Corbolan, F. Beaulieu, S. Armony, J. L. Emotion regulation in bipolar disorder: an
fMRI study, Psychology Medicine, 45-12, 2521-31

Ali, N., Nitschke, J. P., Cooperman, C., Baldwin, M. W., & Pruessner, J. C. (2020).
Systematic manipulations of the biological stress systems result in sex-specific
compensatory stress responses and negative mood
outcomes. Neuropsychopharmacology, 45(12), 2521-2531.

Bio of Lead Instructor and Support Collaborator

Laurette Dubé is the founding Chair and Scientific Director of the McGill Centre for the Convergence of Health Economics. She holds the James McGill Chair of Consumer and Lifestyle Psychology and Marketing. Her work has been published in top disciplinary journals in Psychology, Management and Medicine as well as in multidisciplinary journals. She holds an MBA in finance, and a PhD in behavioural decision making and consumer psychology. In close collaboration with co-lead Brown and a worldwide network of scientist and action leaders, she has pioneered an approach to convergence research and innovation that is powered by digital platforms and large-scale data sets and centred around real-world projects with action partners operating at city, province, country and global levels. During her 2020-2021 sabbatical, she is a visiting scholar at the National Research Council of Canada and at the Pittsburgh Supercomputing Center, Carnegie Mellon, USA.

Luiza Mugnol-Ugarte **Luiza Mugnol-Ugarte** received a PhD in Research and Education (IDOR; 2021), Rio de Janeiro, Brazil. She received a Bachelor in Economics from Federal University of Santa Catarina (UFSC; 2013), Florianópolis, Brazil; and a Master in Biological Sciences (Neuroscience) from the Federal University of Rio Grande do Sul (UFRGS; 216). She has experience in decision making, social neuroscience, neuroimage and neuroeconomics, with an interest in the following topics: smart cities, behaviour, well being, human behavior, choice, pollution and well being and psychedelics. She has been working on different projects of scientific dissemination since 2014.

Bio of Specialized Guest Instructors

<https://www.dropbox.com/sh/f3spbhkjohw1qse/AACv5e9J-YHsNSWsGxfInF-qa?dl=0>

Bio of Keynotes in BtS Background Webinars

<https://www.dropbox.com/sh/1p2u22xlue98y5i/AACoQ8gwFC-TuUHQFEkmUhaBa?dl=0>

SYLLABUS