Sean Devine

PhD STUDENT & BEHAVIOURAL SCIENTIST

McGill University, 2001 McGill College, H3A 1G1, QC, Canada

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Summary

PhD Student at McGill University and Behavioural Scientist at IntactLab

Research interests: Cognitive effort, real-world decision-making (Big Data), statistical modelling

Education

McGill University	Montreal, Canada
Ph.D. In Experimental Psychology (Cognitive Science)	2020-Present
Concordia University	Montreal, Canada
Master Of Experimental Psychology	2020
Concordia University	Montreal, Canada
Bachelor Of Psychology	2018

Awards and Grants

Total value: $299 050

Postdoctoral Fellowship	NSERC
In recognition of: outstanding research proposed by an upcoming postdoctoral student ($90 000)	2024
Graduate Research Scholarship	APF
In recognition of: outstanding research proposed by a graduate student in psychology ($2000)	2022
Student Ambassador Award	NSERC
In recognition of: funding for community outreach project to promote science among underrepresented groups ($1000)	2021
Postgraduate Scholarship-Doctoral	NSERC
In recognition of: doctoral students' academic success and research potential ($63 000)	2021
Graduate Excellence Award	McGill University
In recognition of: academic excellence at the graduate level ($ 2550)	2020
Bourses de Doctorat en Recherche	FRQNT
In recognition of: doctoral students' academic success and research potential. ($84 000)	2020
Canada Graduate Scholarship-Master's Program	SSHRC
In recognition of: new master's students' academic success and research potential ($17 500)	2019
Bourses de Maîtrise en Recherche	FRQNT
In recognition of: new masters' students' academic success and research potential ($17 500)	2019
Graduate Special Entrance Award	Concordia University
In recognition of: incoming masters' students entering the program with federal or provincial funding ($6000)	2019
Undergraduate Research Award	NSERC
In recognition of: students' academic success and research potential ($7125 + $2000 FRQNT supplement)	2018
Undergraduate Research Award	Concordia University
In recognition of: students' academic success and research potential ($5625)	2017
Arts and Science Scholar	Concordia University
In recognition of: students with a GPA in the top 1% of their department	2016-2018
Dr. Alex Vincent Scholarship in Psychology	Concordia University
In recognition of: psychology students' academic excellence and commitment to the field ($750)	2018

Employment

Behavioural Scientist	IntactLab
	(Intact Insurance)
	2023-Present

- Developed behavioural interventions to solve both client-facing and employee business problems
- Leveraged AI (PyTorch, XGBOOST) models for topic modeling, risk prediction, and sentiment analysis
- Analyzed large data sources to simulate business path success likelihood
- Designed scientific experiments to test new products and ideas
- Introduced new statistical techniques (e.g., Bayesian analysis) into industry
- Developed new analysis pipelines and integrated with existing dashboards (PowerBI)

Research Experience

Otto Lab

McGill University

Ph.D. Student (supervisor: Dr. Ross Otto)

2020-Present

- Designed numerous experiments, using Python, JavaScript, and MATLAB (including backend with SQL and Postgres)
- Analyzed experimental and large-scale consumer data
- Fit computational and deep learning models to empirical data
- Published results in high-impact, peer-reviewed, journals
- Presented results at multiples international conferences
- Led multiple workshops, teaching colleagues and students advanced statistical techniques

Lifespan Decision-Making Lab

Concordia University

Masters Student and Research Coordinator (supervisor: Dr. Ross Otto)

2018-2020

- Designed numerous experiments, using Python, JavaScript, and MATLAB
- Analyzed experimental data, resulting in the completion of a master's thesis and defence
- Fit computational models to empirical data
- Published results in high-impact, peer-reviewed, journals
- Presented results at multiples international conferences
- Digitized pre-existing paper-and-pencil experiments, implementing open science best practices

Articles

Under Review

Devine, S., James Goulding, John Harvey, Anya Skatova[†] & A. Ross Otto[†]. (in revision). Decoy Effects in the Wild: Evidence for (and Constraints on) Attraction Effects in Real-World Consumer Choices. *Psychological Science*.

Brown, C.S., **Devine, S.**, A. R. Otto, Bischoff-Grethe, A., & Wierenga, C. E. (under review). Greater reliance on model-free learning in adolescent anorexia nervosa: An examination of dual-system reinforcement learning. *Translational Psychiatry*.

Devine, S., Germain, N., Kasprzyk, A., Eppinger, B. (in revision). Changes in The Prevalence of Muscular, but Not Thin Bodies, Bias Young Men's Judgments About Body Size. *Journal of Masculinity and Men*.

Devine, S., Falk, C. F., & Fujimoto, K. A. (under review). Comparing the Accuracy of Three Predictive Information Criteria for Bayesian Linear Multilevel Model Selection. *Multivariate Behavioral Research*.

2024

Devine, S., Roy, M., Beierholm, U., Otto, A.R. (2024). Proximity to Rewards Modulates Parameters of Effortful Control Exertion. *Journal of Experimental Psychology: General*. https://doi.org/10.1037/xge0001561

Devine, S., Otto, A. R., Uanhoro, J. O., & Flake, J. K (2024). A Tutorial for Quantifying Within and Between-Participant Variance in Multilevel Logistic Models. *Collabra: Psychology*. https://doi.org/10.1525/collabra.94263

Devine, S., da Silva Castanheira, K., Fleming, S. M., & Otto, A. R. (2024). Distinguishing between Intrinsic and Instrumental Sources of the Value of Choice. *Cognition, 245*. https://doi.org/10.1016/j.cognition.2024.105742

2023

Devine, S., Vassena, E., & Otto, A. R. (2023). More than a Feeling: Physiological Measures of Affect Index the Integration of Effort Costs and Rewards During Effortful Decision-Making. *Cognitive, Affective, Behavioral Neuroscience*. https://doi.org/10.3758/s13415-023-01095-3

2022

Otto A.R., **Devine, S.**, Bornstein, A.M., & Louie, K. (2022). Context-dependent choice and evaluation in real-world consumer behavior. *Scientific Reports, 12*, 17744

Devine, S. ,Neumann,C., Levari, D., Eppinger,B. (2022).Human Ageing is Associated with More Rigid Concept Spaces. *Psychonomic, Bulletin, & Review*. https://doi.org/10.3758/s13423-022-02197-8

Devine, S., Germain, N., Ehrlich, S., & Eppinger, B. (2022). Changes in the Prevalence of Thin Bodies Bias Young Women's Judgments About Body Size. *Psychological Science, 33*(8), 1212-1225. https://doi. org/10.1177/09567976221082941

Devine, S. & Otto, A.R.(2022). Information about task progress modulates cognitive demand avoidance. *Cognition, 225*, 105107. https://doi.org/10.1016/j.cognition.2022.105107

2021

Devine, S., Neumann, C., Otto, A. R., Bolenz, F., Reiter, A., & Eppinger, B. (2021). Seizing the opportunity: Lifespan differences in the effects of the opportunity cost of time on cognitive control. *Cognition*, *216*, 104863. https://doi.org/10.1016/j.cognition.2021.104863

Ruel, A., **Devine, S.**, & Eppinger, B. (2021). Resource-rational approach to meta-control problems across the lifespan. *Wiley Interdisciplinary Reviews: Cognitive Science, 12*(5), e1556. https://doi.org/10.1002/wcs.1556

Presentations

Colloquia and Invited Talks

Context-Dependency in Cognitive Effort Valuation and Decision-Making. Behavioural Control Seminar, Radboud University. February 2024. Invited speaker.

Conference Proceedings and Published Abstracts

Sean Devine & A. Ross Otto. Making Progress on the Effort Paradox: Information about task progress modulates cognitive demand avoidance. (2021). In *Proceedings of the 43rd Annual Meeting of the Cognitive Science Society*.

Sean Devine, Cassandra Neumann, David E. Levari, Robert Wilson, & Ben Eppinger. (2020). Prevalence-induced concept change in older adults. In *Proceedings of the 42nd Annual Meeting of the Cognitive Science Society*. Montreal, CA. [Contributed Talk].

Sean Devine, Cassandra Neumann, David E. Levari, Robert Wilson, & Ben Eppinger. (2020). Prevalence-induced concept change in older adults. Accepted at *Cognitive Ageing 2020*, Atlanta, Georgia, USA.

Sean Devine, Florian Bolenz, Joni Shuchat, Ross Otto, & Andrea Reiter. Ageing-related changes in the effects of opportunity costs on cognitive effort(2019). In *The Multidisciplinary Conference on Reinforcement Learning and Decision Making 2019*. Montreal, QC, Canada.

Ben Eppinger, **Sean Devine**, Florian Bolenz, Joni Shuchat, Ross Otto, & Andrea Reiter. Ageing-related changes in the effects of opportunity costs on cognitive effort. Accepted at *FENS2018*, Berlin, Germany, July 2018.

Poster Presentations

Sean Devine, Mario Bogdanov, Ziqi Fu, Madeleine Sharpe, A. Ross Otto. *No Evidence for a Generalized Construct of Cognitive Effort Aversion*. Cognitive Neuroscience Society Annual Meeting. Toronto, ON, Canada, 2024.

Sean Devine, Mario Bogdanov, Ziqi Fu, A. Ross Otto. T*hrowing good effort after bad: Evidence for a sunk-cost effect in cognitive effort-based decision-making.* Society for Neuroeconomics Meeting. Vancouver, BC, Canada, 2023.

Sean Devine, Mathieu Roy, Ulrik Beierholm, A. Ross Otto. Proximity to Appetitive and Aversive Goals Jointly Determines Parameters of Effortful Control Exertion. Presented at the *3rd Workshop on Mental Effort*. Providence, RI, USA, 2022.

Sean Devine, Anya Skatova, James Goulding, A. Ross Otto. Decoy Effects in a Massive Real-World Retail Dataset. Presented at *The Society for Judgment and Decision-Making Annual Meeting 2022*. San Diego, CA, USA, 2022. **[Runner-up for best student poster award]**.

Sean Devine, Eliana Vasenna, Emma Kiedyk, A. Ross Otto. Physiological Measures of Affective Valence and Arousal Index Effort Costs During Decision-Making. Presented at *The Multi-disciplinary Conference on Reinforcement Learning and Decision Making 2022*. Providence, RI, USA, 2022.

Alexa Nordine, **Sean Devine**, Emma Kiedyk, A. Ross Otto. Physiological Measurements of Emotion in Risky Decision-Making: Examining EMG and SCR Responses to Choice Outcome. Presented at *CPA's 83rd Annual National Convention*. Calgary, AB, Canada, 2022.

A. Ross Otto, **Sean Devine**, Aaron M. Bornstein, & Kenway Louie. Context-dependent choice and evaluation in real-world consumer behavior. Presented at the *Society for Neuroeconomics Annual Meeting 2021*. Online, 2021.

Sean Devine & A. Ross Otto. Making Progress on the Effort Paradox: Information about task progress modulates cognitive demand avoidance. Presented at *CogSci2021*, Montreal, Canada, 2021.

Sean Devine, Nathalie Germaine, Stefan Erhlich, & Ben Eppinger. Changes in The Prevalence Of Thin Bodies Biases Young Women's Judgements about Body Size. Presented at *Canadian Society for Brain, Behaviour and Cognitive Science: Annual Meeting 2021*, Montreal, Canada, 2021.

Sean Devine & A. Ross Otto. Making Progress on the Effort Paradox: Information about task progress modulates cognitive demand avoidance. Presented at *Canadian Society for Brain, Behaviour and Cognitive Science: Annual Meeting 2021*, Montreal, Canada, 2021.

Sean Devine, Cassandra Neumann, David E. Levari, Robert Wilson, & Ben Eppinger. Prevalence-induced concept change in older adults. Accepted at *Cognitive Ageing 2020*, Atlanta, Georgia, USA, 2020.

Sean Devine, Cassandra Neumann, David E. Levari, Robert Wilson, & Ben Eppinger. Prevalence-induced Concept Change in Older Adults. Presented at the Annual *CRDH Conference 2020*, Montreal, Canada, January, 2020.

Sean Devine, Florian Bolenz, Joni Shuchat, Ross Otto, & Andrea Reiter. Ageing-related changes in the effects of opportunity costs on cognitive effort. Presented at *RLDM2019*, Montreal, Canada, July 2019.

Sean Devine, Florian Bolenz, Joni Shuchat, Ross Otto, & Andrea Reiter. Ageing-related changes in the effects of opportunity costs on cognitive effort. Presented at the Annual *CRDH Conference 2020*, Montreal, Canada, February 2019. Winner of the best undergraduate poster presentation award (value: $100).

Sean Devine, Florian Bolenz, Joni Shuchat, Ross Otto, & Andrea Reiter. Ageing- related changes in the effects of opportunity costs on cognitive effort Presented at the *6th FLUX Conference*, Berlin, Germany, August 2018.

Ben Eppinger, **Sean Devine**, Florian Bolenz, Joni Shuchat, Ross Otto, & Andrea Reiter. Ageing-related changes in the effects of opportunity costs on cognitive effort. Presented at the *11th FENS (Forum of Neuroscience)*, Berlin, Germany, August 2018.

Conference Talks

Sean Devine, Anya Skatova, James Goulding, A. Ross Otto. Decoy Effects in a Massive Real-World Retail Dataset. Presented at *The Society for Judgment and Decision-Making Annual Doctoral Symposium 2023*. Online, 2023. **[Invited speaker]**.

Sean Devine, Mathieu Roy, Ulrik Beierholm, A. Ross Otto. Proximity to Appetitive and Aversive Goals Jointly Determines Parameters of Effortful Control Exertion. Presented at *Society for Neuroscience Meeting 2022*. San Diego, CA, USA, 2022.

Sean Devine, A. Ross Otto, Aaron M. Bornstein, & Kenway Louie. Context-dependent choice and evaluation in real-world consumer behavior. Talk given at *Math Psych 2021*, online. July 2021.

Sean Devine, Cassandra Neumann, David E. Levari, Robert Wilson, & Ben Eppinger. Prevalence-induced concept change in older adults. Speech given at *CogSci2020*, Toronto, Canada, July 2020. [Online due to COVID].

Sean Devine, Cassandra Neumann, & Alexa Ruel. Life of the mind: Judgment and decision making in human ageing. Speech given at *First Annual CRDH Webinar Series*, Montreal, Canada, April 2020.

Leadership

Led Workshops

Introduction to Hierarchical Drift Diffusion Modeling   Feb 2024
Rabound University

Introduction to Reinforcement Learning   Feb 2024
Rabound University

Bayesian Statistics for A/B Tests   Jan 2024
IntactLab

Introduction to Bayesian Statistics   June 2023
IntactLab

Introduction to Data Science [Series]   Nov-Dec 2022
McGill University

Introduction to Bayesian Statistics   March 2022
Concordia University | shorturl.at/dfsR6

Maximum Likelihood Estimation in R   October 2022
Concordia and McGill Universities | https://github.com/seandamiandevine/MLEWorkshop

Multilevel Modeling: Basic and Advanced Topics   June-July 2021
Concordia and McGill Universities | https://github.com/seandamiandevine/MLMTutorial_2021

Programming Experiments Online   April 2022
Concordia, McGill, and TU Dresden Universities

Python for Psychologists   April 2020
Concordia University

Other Leadership Roles

Journal of Trial and Error
2019-Present

Editor of Psychology

- Editor for an international journal that aims to close the gap between what is research and what is published by highlighting important scientific failures
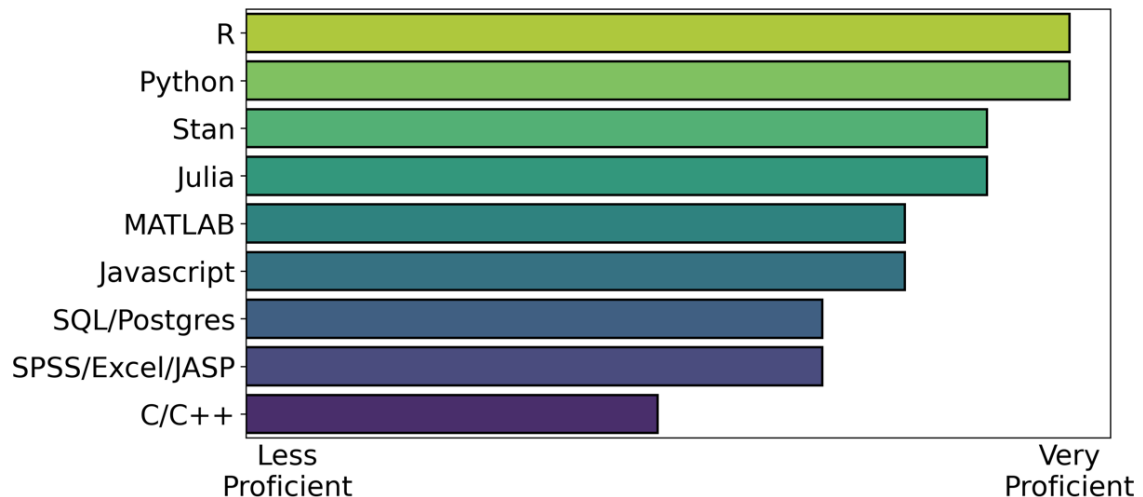- Write and contribute to editorials on the role of failure in psychological science

2018

***Science of Learning* Symposium, Berlin, Germany**

Assistant Organizer

- Assisted in planning and organization of an international symposium on recent neuroscientific, developmental, and social advancements in learning science

Professional Skills

Programming Languages

Other Work and Extracurricular Experience

Teaching Assistantships

Statistics Help Desk
2023

McGill University

Introduction to Statistics
2021

McGill University and Concordia University

Statistics for Experimental Design
2021

McGill University

Editorial Activities—Reviewer

I have served as reviewer for the following journals: The Psychological Science Accelerator, Personality and Social Psychology Bulletin, Perspectives in Psychological Science, Cognitive, Affective, & Behavioural Neuroscience, Cognition, Royal Society for Open Science, Advances in Cognitive Science, and the Journal of Trial and Error.

Additional Training

Deep Learning Summer School
2021

Neuromatch Academy