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Education

Ph.D., Psychology & Neuroscience. **Princeton University** 2013-2018
Adviser: Jordan A. Taylor

B.A., Neuroscience & Behavior. **Vassar College** 2005-2009

Research Interests

The computational principles and neural substrates of learning; cognitive contributions to reinforcement and motor skill learning; the interaction between controlled and automatic processes in decision-making and learning; the representation and neural correlates of motor memories

Awards & Honors

Ruth L. Kirschstein National Research Service Award, Individual Postdoctoral Fellowship (NRSA F32), **National Institute of Mental Health** 2019

Young Investigator Scholarship Award, **Neural Control of Movement** 2019

Graduate Research Fellowship (GRFP), **National Science Foundation** 2015-2018

Centennial Scholar Fellowship, **Princeton University** 2013-2017

Appointed Chair, **Gordon Research Seminar: Cerebellum** 2017

Young Researcher Award, **Karniel Computational Motor Control Workshop** 2017

Best Poster Award, **Progress in Motor Control** 2015

General Honors, **Vassar College** 2009

Inducted Member, **Psi Chi International Honor Society in Psychology** 2008

Research Positions

Postdoctoral Scholar 2018-
Advisers: Anne G.E. Collins, Richard B. Ivry
University of California, Berkeley

Visiting Scholar 2016
Adviser: Richard B. Ivry, **University of California, Berkeley**

Research Technician 2009-2011
Adviser: Javier F. Medina, **University of Pennsylvania**

Working Papers

Samuel D. McDougle, Peter A. Butcher, Darius Parvin, Faisal Mushtaq, Yael Niv, Richard B. Ivry, & Jordan A. Taylor (2019)
Neural Signatures of Prediction Errors in a Decision-Making Task are Modulated by Action Execution Failures
[In Revision]; bioRxiv preprint

Faisal Mushtaq, **Samuel D. McDougle**, Matt P. Craddock, Darius Parvin, Jack Brookes, Mark Mon-Williams, Jordan A. Taylor, & Richard B. Ivry (2019)
The Electrophysiological Correlates of Selection and Execution Errors in Reinforcement Learning
[In Prep]

Publications

Samuel D. McDougle & Jordan A. Taylor (2019)
Dissociable Cognitive Strategies for Sensorimotor Learning
Nature Communications, 10(1), 40

Jordan A. Taylor & **Samuel D. McDougle** (2019)
Visuomotor Adaptation Tasks as a Window into the Interplay Between Explicit and Implicit Cognitive Processes
The Cognitive Neurosciences, 6th edition (ed. Michael S. Gazzaniga) *[In Press]*

Darius E. Parvin, **Samuel D. McDougle**, Jordan A. Taylor, & Richard B. Ivry (2018)
Credit Assignment in a Motor Decision Making Task is Influenced by Agency and not Sensorimotor Prediction Errors
Journal of Neuroscience, 38(19): 4521-4530

Samuel D. McDougle, Krista M. Bond, & Jordan A. Taylor (2017)
Implications of Plan-based Generalization in Sensorimotor Adaptation
The Journal of Neurophysiology, 118(1): 383-393

Samuel D. McDougle, Matthew J. Boggess, Matthew J. Crossley, Darius Parvin, Richard B. Ivry, & Jordan A. Taylor (2016)
Credit Assignment in Movement-Dependent Reinforcement Learning
Proceedings of the National Academy of Sciences, 113(24): 6797-6802

Samuel D. McDougle, Richard B. Ivry, & Jordan A. Taylor (2016)
Taking Aim at the Cognitive Side of Learning in Sensorimotor Adaptation Tasks
Trends in Cognitive Sciences, 20(7): 535-544

Samuel D. McDougle & Jordan A. Taylor (2016)
Mental Rotation as a Behavioral and Neural Model of Explicit Aiming During Visuomotor Learning
Motor Learning & Motor Control 2016

Samuel D. McDougle, Krista M. Bond, & Jordan A. Taylor (2015)
Explicit and Implicit Processes Constitute the Fast and Slow Processes of Sensorimotor Learning
Journal of Neuroscience, 35(26): 9568-9579

Selmaan N. Chettih, **Samuel D. McDougle**, Luis I. Ruffolo, & Javier F. Medina (2011)
Adaptive Timing of Motor Output in the Mouse: The Role of Movement Oscillations in Eyelid Conditioning
Frontiers in Integrative Neuroscience, 5(72)

Invited Talks (*selected*)

Samuel D. McDougle (2018)
The Steep Part of the Curve: Cognitive Representations in Human Learning
Yale Psychology, New Haven, CT

Samuel D. McDougle (2018)
Dynamics of Working Memory Reinforcement Learning Interactions
Stanford Psychology Cognition and Neuroscience Seminar Series 2018, Palo Alto, CA

Samuel D. McDougle (2018)
Parametric and Discrete Representations in Motor Learning
Berkeley Neuroscience Retreat 2018, Richmond, CA

Samuel D. McDougle (2018)
Dissociable Roles for Working Memory in Sensorimotor Learning
Berkeley Cognition and Computation Colloquium 2018, Berkeley, CA

Samuel D. McDougle (2017)
Analog Computations Drive Strategic Re-aiming of an Intended Movement
Karniel Computational Motor Control Workshop 2017, Beer-Sheva, Israel

Samuel D. McDougle (2016)
Mental Rotation as a Behavioral and Neural Model of Explicit Aiming during Visuomotor Learning
Motor Learning and Motor Control 2016, San Diego, CA

Samuel D. McDougle (2015)
Examining the Various Processes Driving Sensorimotor Learning
Gordon Research Conference, Cerebellum: Circuit Physiology, Computation and Disease 2015, Lewiston, ME

Poster Presentations (*selected*)

Samuel D. McDougle, Peter A. Butcher, Darius Parvin, Fasiel Mushtaq, Yael Niv, Richard B. Ivry, & Jordan A. Taylor (2018)

Neural Signatures of Reward Prediction Errors in a Decision-Making Task are Modulated by Action Execution Failures
Society for Neuroscience 2018, San Diego CA

Samuel D. McDougle & Jordan A. Taylor (2018)
Parametric Versus Discrete Working Memory Representations in Sensorimotor Learning
Neural Control of Movement 2018, Santa Fe, NM

Samuel D. McDougle, Richard B. Ivry, & Jordan A. Taylor (2017)
Dissociable Effects of Cerebellar Degeneration on Continuous versus Discrete Working Memory Transformations
Gordon Research Conference: Cerebellum 2017, Lewiston, ME

Samuel D. McDougle & Jordan A. Taylor (2017)
Leveraging the Motor System to Reveal Intermediate Cognitive States
Society for Neuroscience 2017, Washington D.C.

Samuel D. McDougle & Jordan A. Taylor (2017)
Between Zero and One: Evidence for an Analog Computation in the Re-planning of Movements
Neural Control of Movement 2017, Dublin, Ireland

Samuel D. McDougle, Nicholas B. Turk Browne, & Jordan A. Taylor (2016)
Recalibration, Heuristics, and Learning *de novo*: On the Multiple Processes of Sensorimotor Learning and the Role of the Medial Temporal Lobe
Society for Neuroscience 2016, San Diego, CA

Samuel D. McDougle, Krista M. Bond, & Jordan A. Taylor (2016)
The Consequences of Aim-Based Generalization on Visuomotor Adaptation
Neural Control of Movement 2016, Montego Bay, Jamaica

Samuel D. McDougle, Matthew J. Crossley, Matthew B. Boggess, Richard B. Ivry, & Jordan A. Taylor (2015)
Credit Assignment in Movement-Dependent Reinforcement Learning
Learning & Memory 2015, Austin, TX

Samuel D. McDougle, Krista M. Bond, & Jordan A. Taylor (2015)
The Role of Reward, Punishment, and Movement Direction on Implicit Sensorimotor Learning*
Progress in Motor Control 2015, Budapest, Hungary *(Received "Best Poster" award)

Samuel D. McDougle, Krista M. Bond, & Jordan A. Taylor (2015)
Explicit and Implicit Processes Underlie Fast and Slow Processes of Motor Learning
Neural Control of Movement 2015, Charleston, SC

Peter A. Butcher, Richard B. Ivry, **Samuel D. McDougle**, Sheng-Han Kuo, David Rydz, John W. Krakauer, & Jordan A. Taylor (2015)
Cerebellar Degeneration Disrupts Aiming Strategies and Motor Adaptation in a Sensorimotor Learning Task
Gordon Research Conference, Cerebellum: Circuit Physiology, Computation and Disease 2015, Lewiston, ME

Samuel D. McDougle, Richard B. Ivry, & Jordan A. Taylor (2014)
Sensory Prediction Errors Affect Reinforcement Learning
Society for Neuroscience 2014, Washington D.C.

Charlotte Arlt, Farzaneh Najafi, **Samuel D. McDougle**, Samuel S.-H. Wang, Ilker Ozden, & Javier F. Medina (2010)
Eyeblink Conditioning and *In Vivo* Calcium Imaging in Mice Walking on a Floating-Ball Apparatus
Society for Neuroscience 2010, San Diego, CA

Teaching

Teaching Assistant: *Cognitive Psychology* (Princeton University)
Lead Lecturer: *Introduction to Psychology* (Princeton Prison Teaching Initiative)
Private Tutor: *AP Biology and Math* (Bespoke Education, New York City)

Mentoring

Ham Huang (2018), undergraduate (Berkeley)
Helen Lu (2018), undergraduate (Berkeley)
Seo Yoon Oh (2018), undergraduate (Berkeley)
Mitashee Das (2017), undergraduate (Princeton)
André Belarmino (2015), undergraduate (Princeton; now medical student at Weill Cornell)
Krista Bond (2014-2017), research assistant (Princeton; now PhD student at Carnegie Mellon)

Outreach

Volunteer Instructor & Group Leader, **Princeton Prison Teaching Initiative** 2014-2016

Ad Hoc Reviewer

Experimental Brain Research
Journal of Cognitive Neuroscience
Journal of Mathematical Psychology
Journal of Neurophysiology
Journal of Experimental Child Psychology
NeuroImage
PLoS

Other Activities

Editorial Consultant: Worked for Samsung and Razorfish LLC developing a tech and culture mobile app (2012)

Science Writer/Contributor: Wrote 60+ pieces for media outlets including *The Atlantic*, *Motherboard*, and *The World Science Festival* (2011-2014)

Musician/Music Educator: Former member (fiddle/guitar) of musical groups "The Powder Kegs" and "Tumbling Bones;" European and US touring at folk festivals and venues, including an appearance on American Public Media's nationally syndicated radio show *A Prairie Home Companion* (2007)