

**Samuel David McDougle** ■ mcdougle@berkeley.edu ■ Phone: (646) 369-0651  
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## **Education**

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

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

## **Research Interests**

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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**

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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**

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Postdoctoral Fellow 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

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**Samuel D. McDougle** & Anne G.E. Collins (2019)  
Parallel Working Memory and Instrumental Learning Processes Explain Choice Reaction Times

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

## Publications

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**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  
*Current Biology [In Press]*

**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*)

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**Samuel D. McDougle** (2019)  
Cerebellar Contributions to Visuomotor Cognition  
*Neural Control of Movement 2019, Toyama, Japan*

**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)

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Guy Avraham, Jordan A. Taylor, Richard B. Ivry, & **Samuel D. McDougle** (2019)  
Is Visuomotor Adaptation Classical Conditioning?  
*Neural Control of Movement 2019, Toyama, Japan*

**Samuel D. McDougle** & Anne G.E. Collins (2019)  
Uncertainty in Choice Policy Explains Reaction Time: Toward a Unified Account of Set Size, Repetition, Delay, and Learning Effects on Choice Reaction Time  
*Cognitive Neuroscience Society 2019, San Francisco, CA*

**Samuel D. McDougle**, Peter A. Butcher, Darius Parvin, Faisal 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**

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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**

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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**

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Volunteer Instructor & Group Leader, **Princeton Prison Teaching Initiative**

2014-2016

## **Ad Hoc Reviewer**

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

## **Other Activities**

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*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)