

Heather R. McGregor

POSTDOCTORAL FELLOW, NEUROMOTOR BEHAVIOR LABORATORY

Curriculum Vitae · February 14, 2020

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Education

Ph.D. in Neuroscience

THE UNIVERSITY OF WESTERN ONTARIO

- Advisor: Dr. Paul Gribble

London, ON

2018

Honours B.Sc. in Psychology, Neuroscience & Behaviour

McMASTER UNIVERSITY

- Advisor: Dr. Ramesh Balasubramaniam

Hamilton, ON

2011

Research Fellowships

Postdoctoral Fellow

DEPT OF APPLIED PHYSIOLOGY & KINESIOLOGY | UNIVERSITY OF FLORIDA

- Advisor: Dr. Rachael Seidler

Gainesville, FL

2018–present

Visiting Scholar

CENTRE FOR SENSORIMOTOR PERFORMANCE | UNIVERSITY OF QUEENSLAND

- Advisor: Dr. Timothy Carroll

Brisbane, Australia

2017

Publications

* Supervised or co-supervised trainees

9. Cashaback JGA, Lao C, Palidis DJ, Coltman SK, **McGregor HR**, Gribble PL (2019). The gradient of the reinforcement landscape influences sensorimotor learning. *PLoS Computational Biology*, 15(3): e1006839.
8. **McGregor HR**, Cashaback JGA, Gribble PL (2018). Somatosensory perceptual training enhances motor learning by observing. *Journal of Neurophysiology*, 120(6): 3017–3025.
7. **McGregor HR**, Vesia M, *Rinchon C, Chen R, Gribble PL (2018). Changes in corticospinal excitability associated with motor learning by observing. *Experimental Brain Research*, 236(10): 2829–2838.
6. **McGregor HR**, Gribble PL (2015). Functional connectivity between somatosensory and motor brain areas predicts individual differences in motor learning by observing. *Journal of Neurophysiology*, 118(2): 1235–1243.

5. Cashaback JGA, **McGregor HR**, Mohatarem A, Gribble PL (2017). Dissociating error-based and reinforcement-based loss functions during sensorimotor learning. *PLoS Computational Biology*, 13(7): e1005623.
4. Cashaback JGA, **McGregor HR**, Pun H, Buckingham G, Gribble PL (2017). Does the sensorimotor system minimize prediction error or select the most likely prediction during object lifting. *Journal of Neurophysiology*, 117(1): 260–274.
3. **McGregor HR**, Cashaback JGA, Gribble PL (2016). Functional plasticity in somatosensory cortex supports motor learning by observing. *Current Biology*, 26(7): 921–927.
2. **McGregor HR**, Gribble PL (2015). Changes in visual and sensory-motor resting-state functional connectivity support motor learning by observing. *Journal of Neurophysiology*, 114(1): 677–688.
1. Cashaback JGA, **McGregor HR**, Gribble PL (2015). The human motor system alters its reaching movement plan for task-irrelevant, positional forces. *Journal of Neurophysiology*, 113(7): 2137–2149.

Awards, Scholarships, & Distinctions

2020	NASA Human Research Program Augmentation Grant , National Aeronautics and Space Administration	\$ 30,000
2019–21	NSERC Postdoctoral Fellowship (top committee-ranked application) , Natural Sciences & Engineering Research Council of Canada	\$ 90,000
2018	Nominated for Canada’s Distinguished Dissertation Award , Canadian Association for Graduate Students	
2018	Nominated for Governor General’s Gold Medals , The University of Western Ontario	
2018	Nominated for The Collip Medal , The University of Western Ontario	
2017–18	Australian Endeavour Research Fellowship , Government of Australia	\$ 23,500
2017	Israel Travel Grant , Edmond & Lily Safra Center for Brain Sciences, The Hebrew University of Jerusalem	\$ 3,000
2016	NSERC Michael Smith Foreign Study Supplement , Natural Sciences & Engineering Research Council of Canada	\$ 6,000
2014–17	NSERC Canada Graduate Scholarship - Doctoral Level , Natural Sciences & Engineering Research Council of Canada	\$ 105,000
2014–15	Ontario Graduate Scholarship (declined) , Province of Ontario	\$ 15,000
2013	OHBM Trainee Abstract Award , Organization for Human Brain Mapping	\$ 700
2012–13	Ontario Graduate Scholarship , Province of Ontario	\$ 15,000
2011–12	NSERC Canada Graduate Scholarship - Master’s Level , Natural Sciences & Engineering Research Council of Canada	\$ 17,500
2011–12	Ontario Graduate Scholarship (declined) , Province of Ontario	\$ 15,000

Book Chapters

1. **McGregor HR**, Gribble PL (2016). Observational Motor Learning. In SS Obhi & ES Cross (eds.). *Shared Representations: Sensorimotor Foundations of Social Life (Social Neuroscience Series)*. Cambridge University Press, 525-540

Invited Talks

5. A Role for the Somatosensory System in Observational Motor Learning. **University of Michigan, Ann Arbor, MI**, 2018.
4. Role of the Somatosensory System in Motor Learning by Observing. **Progress in Motor Control Meeting, Miami, FL**, 2017.
3. Role of the Somatosensory System in Motor Learning by Observing. **York University, Toronto, ON**, 2017.
2. Functional Plasticity in Somatosensory Cortex Supports Motor Learning by Observing. **The Hebrew University of Jerusalem, Kibbutz Ein-Gedi, Israel**, 2017.
1. The somatosensory system supports motor learning by observing. **The University of Western Ontario, London, ON**, 2015.

Conference Presentations

ORAL PRESENTATIONS

7. Salazar AP, Hupfeld KE, Lee JK, **McGregor HR**, Gadd NE, Koffman IS, De Dios YE, Mulder E, Bloomberg JJ, Mulvara AP, Seidler RD (2020). Neural Spatial Working Memory Changes During a Spaceflight Analog With Elevated Carbon Dioxide. *NASA Human Research Program Investigators' Workshop*, Galveston, TX.
6. **McGregor HR**, De Dios YE, Gadd NE, Koffman IS, Bloomberg JJ, Wood S, Mulvara AP, Seidler RD (2020). Effects of Continuous and Intermittent Artificial Gravity of Intracranial Free Water Distribution During Head-down Tilt Bed Rest. *NASA Human Research Program Investigators' Workshop*, Galveston, TX.
5. **McGregor HR**, Gribble PL (2018). Somatosensory Functional Plasticity Supports Observational Motor Learning. *Canadian Society for Brain, Behaviour and Cognitive Science Meeting*, St. John's, Canada.
4. **McGregor HR**, Cashaback JGA, Gribble PL (2017). The somatosensory system supports motor learning by observing.. *Australasian Neuroscience Society sensorimotor satellite meeting*, Sydney, Australia.
3. Cashaback JGA, Lao C, Palidis DJ, Coltman SK, **McGregor HR**, Gribble PL (2017). The reinforcement landscape influences sensorimotor learning. *Journal of Exercise, Movement, & Sport*,

St. John's, Canada.

2. Kistemaker D, Cashaback JGA, **McGregor HR**, Gribble PL (2015). The cost of moving optimally: muscle activation selection. *International Society of Biomechanics*, Edinburgh, Scotland.
1. **McGregor HR**, Gribble PL (2013). Exploring the Neural Basis of Observational Motor Learning using Resting-state fMRI. *Organization for Human Brain Mapping*, Seattle, Washington.

POSTER PRESENTATIONS

28. **McGregor HR**, Reuter EM, Gribble PL, Carroll TJ (2019). Greater neural responses to others' errors is associated with motor learning by observing. *Society for Neuroscience*, Chicago, IL.
27. **McGregor HR**, De Dios YE, Gadd NE, Koffman IS, Bloomberg JJ, Mulvara AP, Seidler RD (2019). Resting-state functional connectivity changes and ophthalmic changes associated with a spaceflight analog environment. *Society for Neuroscience*, Chicago, IL.
26. **McGregor HR**, Lee JK, Gadd NE, Koffman IS, De Dios YE, Bloomberg JJ, Mulvara AP, Seidler RD (2019). Changes in resting-state functional connectivity and behavior associated with a spaceflight analog environment. *Society for the Neural Control of Movement*, Toyama, Japan.
25. **McGregor HR**, Cashaback JGA, Gribble PL (2017). The somatosensory system supports observational motor learning. *Progress in Motor Control meeting*, Miami, FL.
24. **McGregor HR**, Cashaback JGA, Gribble PL (2017). Functional plasticity in somatosensory cortex supports motor learning by observing. *Human Brain Mapping*, Vancouver, BC.
23. **McGregor HR**, Cashaback JGA, Gribble PL (2017). Somatosensory perceptual training enhances motor learning by observing. *Society for the Neural Control of Movement*, Dublin, Ireland.
22. Cashaback JGA, Lao C, **McGregor HR**, Palidis DJ, Coltman SK, Gribble PL (2017). Reinforcement gradient ascent during sensorimotor learning. *Society for the Neural Control of Movement*, Dublin, Ireland.
21. Lao C, Cashaback JGA, **McGregor HR**, Palidis D, Coltman SK, Gribble PL (2017). Ascending the reinforcement gradient during sensorimotor learning. *Southern Ontario Neuroscience Association*, St. Catherine's, ON.
20. **McGregor HR**, *Rinchon VC, Gribble PL, Chen R, Vesia M (2016). Changes in corticospinal excitability associated with motor learning by observing. *Society for Neuroscience*, San Diego, CA.
19. **McGregor HR**, Cashaback JGA, Gribble PL (2016). Functional plasticity in somatosensory cortex supports motor learning by observing. *Society for the Neural Control of Movement*, Montego Bay, Jamaica.

18. Cashaback JGA, Mohatarem A, **McGregor HR**, Gribble PL (2016). Dissociating error-based and reinforcement-based learning. *Neural Control of Movement*, Montego Bay, Jamaica.
17. **McGregor HR**, Cashaback JGA, Gribble PL (2016). Functional plasticity in primary somatosensory cortex supports motor learning by observing. *Canadian Association for Neuroscience*, Toronto, ON.
16. Cashaback JGA, Mohatarem A, **McGregor HR**, Gribble PL (2016). Changing the form of feedback (error-based verse reinforcement-based) leads to dissociable motor adaptation. *Canadian Association for Neuroscience*, Toronto, ON.
15. Diep C, Cashaback JGA, **McGregor HR**, Gribble PL (2016). The relationship between upper limb inertia and decision making at movement initiation. *Southern Ontario Neuroscience Association*, Waterloo, ON.
14. Diep C, Cashaback JGA, **McGregor HR**, Gribble PL (2016). The influence of biomechanics during movement initiation on decision-making. *Western Student Research Conference*, London, ON.
13. **McGregor HR**, Gribble PL (2015). Resting-state functional connectivity predicts observational motor learning. *Organization for Human Brain Mapping meeting*, Honolulu, HI.
12. Cashaback JGA, Mohatarem A, **McGregor HR**, Gribble PL (2015). Bayesian integration of skewed distributions during sensorimotor learning. *Society for Neuroscience*, Chicago, IL.
11. **McGregor HR**, Cashaback JGA, Gribble PL (2015). Neuroplasticity in primary somatosensory cortex supports motor learning by observing. *Society for Neuroscience*, Chicago, IL.
10. **McGregor HR**, Cashaback JGA, Gribble PL (2015). The somatosensory system supports motor learning by observing. *The Brain and Mind Symposium*, London, ON.
9. Pun H, Cashaback JGA, **McGregor HR**, Gribble PL (2015). Motor prediction and object lifting. *Southern Ontario Neuroscience Association*, Hamilton, ON.
8. **McGregor HR**, Gribble PL (2015). Resting-state functional connectivity predicts observational motor learning. *Society for the Neural Control of Movement*, Charleston, SC.
7. Kistemaker D, Cashaback JGA, **McGregor HR**, Gribble PL (2015). On what basis does the brain select muscle activation patterns. *Society for the Neural Control of Movement*, Charleston, SC.
6. Cashaback JGA, **McGregor HR**, Gribble PL (2014). The human motor system adapts reaching movements for both task-relevant and task-irrelevant forces. *Society for Neuroscience*, Washington, USA.
5. **McGregor HR**, Gribble PL (2013). Brain networks underlying observational motor learning. *Society for Neuroscience*, San Diego, CA.
4. **McGregor HR**, Gribble PL. (2013). Brain networks underlying motor learning by observing assessed using resting-state fMRI. *Progress in Motor Control meeting*, Montreal, QC.

3. **McGregor HR, Gribble PL (2013).** Exploring the Neural Basis of Observational Motor Learning using Resting-state fMRI. *Organization for Human Brain Mapping*, Seattle, WA.
2. **McGregor HR, Gribble PL (2013).** Motor learning by observing: A resting-state fMRI study. *Society for the Neural Control of Movement*, San Juan, Puerto Rico.
1. **McGregor HR, Gribble PL (2012).** Mapping functional changes in resting-state sensorimotor networks following active and observational learning using fMRI. *Society for Neuroscience*, New Orleans, LA.

Professional Training

Electroencephalography (EEG) Workshop

THE UNIVERSITY OF WESTERN ONTARIO

London, ON

2016

Representational Similarity Analysis (RSA) Workshop

UNIVERSITY OF CAMBRIDGE

Cambridge, UK

2015

Analysis of Functional NeuroImages (AFNI) Bootcamp

NATIONAL INSTITUTES OF HEALTH

Bethesda, MD

2013

fMRIB Software Library (FSL) Course

UNIVERSITY OF BRISTOL

Bristol, UK

2012

Summer School in Computational Sensorimotor Neuroscience

NORTHWESTERN UNIVERSITY

Evanston, IL

2012

Teaching Experience

UNDERGRADUATE LEVEL

2013–14 **Teaching Assistant & Tutorial Instructor**, Research Methods and Statistical Analysis in Psychology, The University of Western Ontario

PSYCH

2820E

Mentorship

BACHELOR'S THESIS STUDENTS

2015–16 Cricia Rinchon, B.Sc., The University of Western Ontario

2014–15 Anthony Wong, B.Sc., M.D., The University of Western Ontario

2013–14 Meghan Bhatia, B.Sc., M.D., The University of Western Ontario

2012–13 Dan Huynh, B.Sc., M.D., The University of Western Ontario

RESEARCH ASSISTANTS

2016–17 Seth Kibel, B.Sc., The University of Western Ontario

Community Outreach

- 2019 **Volunteer** Girls with Nerve Summer Camp, University of Florida
- 2019 **Volunteer** Biomechanics Day, University of Florida
- 2017 **Volunteer** London Brain Bee, The University of Western Ontario
- 2014–16 **Lead organizer** London Brain Bee, The University of Western Ontario
- 2013 **Volunteer** London Brain Bee, The University of Western Ontario