

# Cassandra Lowe, PhD

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## EXECUTIVE SUMMARY

My primary research goal is to understand the neurobiological mechanisms underlying dietary self-regulation. More specifically, my work uses a multidimensional approach that combines repetitive transcranial magnetic stimulation (rTMS), neuroimaging (EEG, fMRI, MRI) and aerobic exercise methodologies to create causal models linking prefrontal cortical input to dietary self-regulation. This framework has immediate relevance to a growing public health issue in a country where nearly a third of all children, and two thirds of all adults, are overweight. While my past work has focused primarily on building causal models linking the functionality of the dorsolateral prefrontal cortex (dlPFC) to food cravings and consumptive behaviour, the primary focus of future work is to be able to successfully develop these fundamental neurobiological findings into the development and implementation of preventative interventions during critical developmental periods.

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## APPOINTMENTS

### BrainsCAN Tier 1 Postdoctoral Fellow

University of Western Ontario  
The Brain and Mind Institute, Department of Psychology  
Advisors: Drs. J. Bruce Morton and Lindsay Bodell

Sept 2019 - present

### BrainsCAN Tier 2 Postdoctoral Associate

University of Western Ontario  
The Brain and Mind Institute, Department of Psychology  
Advisor: Dr. J. Bruce Morton

April 2018 - August 2019

## EDUCATION

### Doctorate of Philosophy

School of Public Health and Health Systems, University of Waterloo  
Supervisor: Dr. Peter Hall  
Thesis: "*Investigation into the neurocognitive mechanisms underlying self-regulatory processes in eating behaviours*"

Oct 2017

### Masters of Science (Health Studies and Gerontology)

School of Public Health and Health Systems, University of Waterloo

Jan 2014

Supervisor: Dr. Peter Hall

Thesis: *``The effects of continuous theta burst stimulation (cTBS) to the left dorsolateral prefrontal cortex on executive control resources, subjective food cravings, and the consumption of appetitive snack foods ``*

**Bachelor of Arts (Hons) Psychology**  
Brock University

**June 2010**

## **FUNDING HISTORY**

### **FELLOWSHIPS AND STUDENTSHIPS**

2019-2022	BrainsCAN Tier 1 Postdoctoral Fellowship	\$ 210 000
2019-2021	CIHR Postdoctoral Fellowship (accepted in name)	\$ 90 000
2018-2020	BrainsCAN Tier 2 Postdoctoral Fellowship	\$110 000

## **AWARDS AND HONOURS**

2018	Finalist Gold Medal Alumni Award	University of Waterloo	
2017	Doctoral Thesis Completion Award	University of Waterloo	\$5000
2016	AHS Teaching Assistant Award	University of Waterloo	\$500
2015	Brain Star Award	CIHR: Institute of Neurosciences, Mental Health, and Addiction	\$1500
2015	Distinguished Student Award	Society of Behavioural Medicine	\$500
2015	AHS Senate Award	University of Waterloo	\$500
2014	Best Overall Poster Presentation at the PhD Level	Canadian Obesity Network	\$300
2014	Entrance Scholarship	University of Waterloo	\$2500

## **PUBLICATIONS**

**Overview of Metrics:** Peer reviewed manuscripts total = 18, 12 first author. Book chapters total =2, 1 first

author. Received 483 (498 in total) citations since 2015, *h*-index = 12, *i10*-index = 12. The journal's impact factor (IF) and ranking (when available) according to the 2018 Scientific Journal Rankings. It is worth noting that of my publications 11 are in the top 25% of their category.

## JOURNAL CONTRIBUTIONS

18. **Lowe, C.J.**, Morton, J.B., & Reichelt, A.C. (2020). Adolescent obesity and dietary decision making—a brain-health perspective. *The Lancet Child & Adolescent Health*. DOI: [https://doi.org/10.1016/S2352-4642\(19\)30404-3](https://doi.org/10.1016/S2352-4642(19)30404-3)

**Journal Metrics:** 1<sup>st</sup> Quartile Psychology

17. Hall, P. A., Erickson, K., **Lowe, C.**, & Sakib, M. N. (2020). Quantifying cortical resilience in experimental, clinical and epidemiological studies: A conceptually grounded method using non-invasive brain stimulation. *Psychosomatic Medicine*, 82(3), 281-286. DOI: 10.1097/PSY.0000000000000785

**Journal Metrics:** 1<sup>st</sup> Quartile Applied Psychology **IF:** 3.97

16. **Lowe, C.J.**, Reichelt A.C., & Hall, P.A (2019). The Prefrontal Cortex and Obesity: A Health Neuroscience Perspective. *Trends in Cognitive Sciences*, 23, 349-361 DOI: <https://doi.org/10.1016/j.tics.2019.01.005>

**Journal Metrics:** 1<sup>st</sup> Quartile Cognitive Neuroscience (#1 Cognitive Neuroscience) **IF:** 15.40

15. **Lowe, C.J.**, & Reichelt A.C. (2019). Can magnetic resonance imaging reveal the neural signatures of dietary self-control? *Journal of Neuroscience*, 39, 581-583. DOI: <https://doi.org/10.1523/JNEUROSCI.1972-18.2018>

**Journal Metrics:** 1<sup>st</sup> Quartile Neuroscience (#10 Neuroscience) **IF:** 6.07

14. **Lowe, C.J.**, & Hall, P.A. (2018) Reproducibility and sources of interindividual variability in the responsiveness to prefrontal continuous theta burst stimulation (cTBS). *Neuroscience Letters*, 687, 280-284. DOI: <https://doi.org/10.1016/j.neulet.2018.09.039>.

**Journal Metrics:** 3<sup>rd</sup> Quartile Neuroscience **IF:** 2.18

13. Hall P.A., **Lowe C.J.** (2018). Cravings, currents and cadavers: What is the magnitude of tDCS effects on food craving outcomes? *Nutritional Neuroscience*, 1-4.

**Journal Metrics:** 1<sup>st</sup> Quartile Medicine **IF:** 3.76

12. **Lowe, C.J.**, Staines, W.R., Manocchio, F., Hall, P.A., Staines, W.R., Hall, P.A., Manocchio, F., Hall, P.A., (2018). The neurocognitive mechanisms underlying food cravings and snack food consumption. A combined continuous theta burst stimulation (cTBS) and EEG study. *Neuroimage* 177, 45–58. DOI: <https://doi.org/10.1016/j.neuroimage.2018.05.013>.

**Journal Metrics:** 1<sup>st</sup> Quartile Cognitive Neuroscience (#4 Cognitive Neuroscience) **IF:** 5.43

11. Hall, P.A., **Lowe, C.J.**, Safati, A.B., Li, H., Klassen, E.B., Burhan, .A.M. (2018). Effects of left dlPFC modulation on social cognitive processes following food sampling. *Appetite* 126, 73–79. DOI:

<https://doi.org/10.1016/j.appet.2018.03.022>

**Journal Metrics:** 1<sup>st</sup> Quartile Psychology

**IF:** 3.17

10. **Lowe, C.J.**, Manocchio, F., Safati, A.B., Hall, P.A. (2018). The effects of theta burst stimulation (TBS) targeting the prefrontal cortex on executive functioning: A systematic review and meta-analysis. *Neuropsychologia* 111, 344-359. DOI: <https://doi.org/10.1016/j.neuropsychologia.2018.02.004>.

**Journal Metrics:** 1<sup>st</sup> Quartile Cognitive Neuroscience

**IF:** 2.89

9. Hall, P. A., **Lowe, C.**, & Vincent, C. (2017). Brain Stimulation Effects on Food Cravings and Consumption: An Update on Lowe et al. (2017) and a Response to Generoso et al. (2017). *Psychosomatic Medicine*, 79(7), 839–842. DOI: <https://doi.org/10.1097/PSY.0000000000000504>

**Journal Metrics:** 1<sup>st</sup> Quartile Applied Psychology

**IF:** 3.97

8. **Lowe, C. J.**, Safati, A., & Hall, P. A. (2017). The neurocognitive consequences of sleep restriction: A meta-analytic review. *Neuroscience & Biobehavioral Reviews*, 80, 586–604. DOI: <https://doi.org/10.1016/j.neubiorev.2017.07.010>

**Journal Metrics:** 1<sup>st</sup> Quartile Cognitive Neuroscience

**IF:** 9.44

7. **Lowe, C. J.**, Staines, W. R., & Hall, P. A. (2017). Effects of moderate exercise on cortical resilience: A transcranial magnetic stimulation study targeting the dorsolateral prefrontal cortex. *Psychosomatic Medicine*, 79(2), 143-152–10. <http://doi.org/10.1097/PSY.0000000000000361>

**Journal Metrics:** 1<sup>st</sup> Quartile Applied Psychology

**IF:** 3.97

6. **Lowe, C. J.**, Vincent, C., & Hall, P. A. (2017). Effects of noninvasive brain stimulation on food cravings and consumption. *Psychosomatic Medicine*, 79(1), 2–13. DOI: <http://doi.org/10.1097/PSY.0000000000000368>

**Journal Metrics:** 1<sup>st</sup> Quartile Applied Psychology

**IF:** 3.97

5. **Lowe, C. J.**, Kolev, D., & Hall, P. A. (2016). An exploration of exercise-induced cognitive enhancement and transfer effects to dietary self-control. *Brain and Cognition*, 110, 102–111. DOI: <http://doi.org/10.1016/j.bandc.2016.04.008>

**Journal Metrics:** 2<sup>nd</sup> Quartile Cognitive Neuroscience

**IF:** 2.43

4. **Lowe, C. J.**, Hall, P. A., & Staines, W. R. (2014). The effects of continuous theta burst stimulation to the left dorsolateral prefrontal cortex on executive function, food cravings, and snack food consumption. *Psychosomatic medicine*, 76(7), 503-511. DOI: 10.1097/PSY.0000000000000090

**Journal Metrics:** 1<sup>st</sup> Quartile Applied Psychology

**IF:** 3.97

3. **Lowe, C. J.**, Hall, P. A., Vincent, C. M., & Luu, K. (2014). The effects of acute aerobic activity on cognition and cross-domain transfer to eating behavior. *Frontiers in Human Neuroscience*, 8. DOI:10.3389/fnhum.2014.00267

**Journal Metrics:** 1<sup>st</sup> Quartile Psychiatry and Mental Health

**IF:** 3.21

2. Hall, P.A., Tran, B., **Lowe, C.J.**, Vincent C., Mourtzakis, M., Roy E., Lui-Ambrose, T., Prapavessis, H., & Gidron, Y. (2015). The expression of executive control in situational context: Effects of facilitating versus restraining cues on snack food consumption. *Health Psychology*, 34(5), 539-546. DOI:10.1037/hea0000134

**Journal Metrics:** 1<sup>st</sup> Quartile Applied Psychology

**IF:** 3.18

1. Hall P.A., **Lowe, C.**, & Vincent, C. (2014). Executive control resources and snack food consumption in the presence of restraining versus facilitating cues. *Journal of Behavioral Medicine*, 37(4), 587-594. doi:10.1007/s10865-013-9528-3

**Journal Metrics:** 1<sup>st</sup> Quartile Psychology

**IF:** 2.50

## BOOK CHAPTERS

2. Hall, P.A., Fong, G.T., & **Lowe C.J.** (2018). Affective dynamics in temporal self-regulation theory: Social forces meet neurobiological processes. In D. Williams, M. Conner, & R. Rhodes, *Affective determinants of health behavior*. Oxford, UK: Oxford University Press.
1. **Lowe, C.**, & Hall, P.A. (2013). Neurobiological facets of food craving and consumption: Evidence from Neuropsychological and Transcranial Magnetic Stimulation (TMS) Studies. In P. Hall (Ed.), *Social Neuroscience and Public Health: Foundations of an Emerging Discipline*. Springer: New York, NY.

## PREPRINTS

1. **Lowe, C.J.**, Cho, I, Goldsmith, S.F. & Morton, J.B. The bilingual advantage in children is not related to language status: a meta-analytic review. <https://psyarxiv.com/spjfg/>

\*Currently under review (Revision Requested) at *Psychological Science*

## SUBMITTED MANUSCRIPTS TO A REFEREED JOURNAL

1. Manocchio, F., **Lowe, C.J.**, Hall, P.A. Investigating the cortical buffering effects of acute exercise: A combined tTBS and EEG study. Under Review at *Neuroimage Reports*

## WORKS IN PREPARATION

3. Shoychet G, **Lowe, C.J.**, Bodell, L.P. The Impact of Calorie Labelling on Food Consumption: The Moderating Role of Body Dissatisfaction. In preparation to be submitted by Sept 2020.
2. **Lowe, C.J.**, Morton, J.B., Leatherdale S, Falkner G., Patte K. Physical activity mediates the association between emotion regulation and snack food consumption: Evidence from the COMPASS study. In preparation to be submitted by Oct 2020.
1. Cho, I., Morton, J.B., **Lowe, C.J.** Continuous theta burst stimulation over the left lateral prefrontal cortex and right temporal parietal junction differentially impacts executive functions and theory of mind. In preparation to be submitted by Nov 2020.

## CONFERENCE CONTRIBUTIONS

### CONFERENCE ABSTRACTS ACCEPTED AS TALKS

1. **Lowe, C.J.** (2019, May). Prefrontal cortical activity modulates obesogenic eating behaviours. Presented at the HBHL Research Day, Montreal Quebec, May 3, 2019.
2. **Lowe, C.J.** (2018, May). Attenuation of Dorsolateral Prefrontal Cortex Activity Increases Appetitive Food Cravings and Consumption Via Heightened Reward Responsivity to High Calorie Food Stimuli. In P.A. Hall (Chair), *Health Neuroscience: Exploring lifestyle factors and brain health*. Symposium conducted at the Association for Psychological Science Annual Convention, San Francisco, CA.
3. **Lowe C.**, Hall P. & Staines W.R. *Testing the causal status of the EF-dietary behaviour link using cortical stimulation techniques*. Presented at the Society of Behavioral Medicine Annual Meeting, San Antonio TX, April 23, 2015.
4. **Lowe, C.**, Hall P., & Staines W.R. *The effects of continuous theta burst stimulation to the left dorsolateral prefrontal cortex on executive function, food cravings, and snack food consumption*. Presented at the 4<sup>th</sup> Canadian Obesity Student Meeting, Waterloo ON, June 19, 2014.

### CONFERENCE ABSTRACTS ACCEPTED AS POSTERS

1. **Lowe, C.J.**, Manocchio, F., & Hall, P.A. (2018, May). *Examination into the reliability and effectiveness of Theta Burst Stimulation (TBS) Protocols targeting the prefrontal cortex in modulating executive function task performance: A systematic review and meta-analysis*. Poster presented at the Association for Psychological Science Annual Convention, San Francisco, CA.
2. **Lowe, C.J.**, Manocchio, F., & Hall, P.A. (2018, May). *Examination into the reproducibility and sources of inter-individual variability in the attenuating effects of continuous theta burst stimulation targeting the dorsolateral prefrontal on executive functions*. Poster presented at the Association for Psychological Science Annual Convention, San Francisco, CA.

3. Manocchio, F., **Lowe, C.J.**, Staines, W.R., & Hall, P.A. (2018, May). *Investigating cortical buffering effects of acute exercise: A cTBS study targeting the left dorsolateral prefrontal cortex*. Poster presented at the Association for Psychological Science Annual Convention, San Francisco, CA.
4. Kolev D., **Lowe C.**, & Hall P. *An exploration of exercise-induced cognitive enhancement and transfer effects to dietary self-control*. Presented at the 36<sup>th</sup> Annual Southern Ontario Neuroscience Association Conference, Waterloo ON, May 6, 2016.
5. **Lowe C.**, Hall P., & Staines W.R. *The effects of moderate exercise on the dorsolateral prefrontal cortex following transient downregulation by continuous theta burst stimulation*. Poster presented at the 36<sup>th</sup> Annual Southern Ontario Neuroscience Association Conference, Waterloo ON, May 6, 2016.
6. **Lowe C.**, Vincent C., Luu K., & Hall P. *The effects of acute aerobic activity on cognition and cross-domain transfer to eating behavior*. Poster presented at the 4<sup>th</sup> Canadian Obesity Student Meeting, Waterloo ON, June 19, 2014.
7. **Lowe C.**, Vincent C., & Hall P. *The effects of situational cues and executive function on snack food consumption among older adults*. Poster presented at the 4<sup>th</sup> Canadian Obesity Student Meeting, Waterloo ON, June 21, 2014.
8. Tran B., **Lowe C.**, & Hall P. *The effect of executive function on dietary behaviors in the presence of external cues*. Poster presented at the 4<sup>th</sup> Canadian Obesity Student Meeting, Waterloo ON, June 21, 2014.
9. **Lowe C.**, Vincent C., & Hall, P. *The influence of facilitating environmental cues on snack food consumption in overweight and obese young adults*. Poster presented at the Canadian Obesity Summit, Vancouver BC, May 1, 2013.
10. Hall, P., **Lowe C.**, & Vincent, C. *The effects of executive control on snack food consumption in the presence of restraining versus facilitating cues*. Poster presented at the Society of Behavioral Medicine Annual Meeting, San Francisco CA, March 20, 2013.
11. **Lowe C.**, Murphy T.I., Homan, D.B. *I was not wrong, was I? ERP correlates of error awareness in an antisaccade task*. Poster presented at the Society for Psychophysiological Research, Portland, OR, Sept 2010.

## MENTORING EXPERIENCE

September 2019 – Present

Jiacheng Yu  
 Department of Psychology  
 Western University  
 Honour's thesis student

September 2019 – Present

Mohammed Sarikahya  
 Department of Psychology  
 Western University

Jan 2019-Present

Independent studies student  
 Isu Cho

April 2015-August 2016	Department of Psychology Western University PhD Candidate Felicia Manocchio School of Public Health and Health Systems University of Waterloo
April 2015-August 2016	Undergraduate research assistant and MSc student Adrian Safati School of Public Health and Health Systems University of Waterloo
Sept 2015-April 2015	Undergraduate research assistant Dimitar Kolev School of Public Health and Health Systems University of Waterloo
Sept 2013-April 2014	Honour's thesis student Kimberely Luu Kinesiology research elective student University of Waterloo
Sept 2013-April 2014	Kathleen Dobson School of Public Health and Health Systems University of Waterloo
Sept 2013-April 2014	Honour's thesis student Betty Tran School of Public Health and Health Systems University of Waterloo Honour's thesis student

## **SCIENTIFIC REVIEW ACTIVITIES**

### **Scientific Journal Ad Hoc Reviewer**

Brain Stimulation, Sleep Medicine Reviews, Appetite, American Journal of Clinical Nutrition, Frontiers in Psychology, Behavioral Neuroscience, Cognitive, Affective and Behavioural Neuroscience, Frontiers in Psychiatry, Nature Human Behaviour

### **Conference Abstract Review and Award Reviews**

- Canadian Obesity Summit Abstract Selection Committee (2016)
- Canadian Obesity Network Student Award Selection Committee (2016)
- Canadian Obesity Student and New Professional Conference Abstract Selection Committee (2014)
- Canadian Obesity Student and New Professional Conference Award Selection Committee (2014)

## **SCIENTIFIC ACTIVITIES**

### **SCIENTIFIC OUTREACH AND PUBLIC COMMUNICATIONS ACTIVITIES**

#### **TEXT INTERVIEWS**



The Globe Mail: <https://www.theglobeandmail.com/life/health-and-fitness/article-how-exercise-may-help-keep-food-cravings-in-check/>

Sydney Morning Herald: <https://www.smh.com.au/lifestyle/health-and-wellness/the-relationship-between-weight-and-self-control-is-complex-20190311-p51398.html>

Trends in Cognitive Sciences Eurekaalert: [https://www.eurekaalert.org/pub\\_releases/2019-02/cp-rsa022119.php](https://www.eurekaalert.org/pub_releases/2019-02/cp-rsa022119.php)

Western News: <https://news.westernu.ca/2019/03/pre-frontal-activity-can-recipe-obesity/>

#### **MEDIA APPEARANCES AND INTERVIEWS**

The Craig Needles Show (AM 980), March 11, 2020

CTV News(London), March 10, 2020

CTV News (London), March 1, 2019.

CBC Radio: Afternoon Drive, February 27, 2019

#### **OTHER OUTREACH ACTIVITIES**

Webinar for the Canadian Positive Psychology Association, April 23, 2019

#### **LEADERSHIP AND ORGANIZATION**

- Board of Directors, Student Member, Canadian Obesity Network 2014 – 2017
- Organizing Committee for Student & Professional Events – Canadian Obesity Summit Sept 2016 – May 2017
- Organizing Committee for Student Events – Canadian Obesity Summit May 2015
- Chair of the Organizing Committee of Canadian Obesity Network Student and New Professional Conference Sept 2013-June 2014