

Response control and emotion regulation;

Research methods: Behavioral experiments, fMRI, EEG/MEG, eyetracking, psychophysiology

GRANTS

2018 MARCH: **VISTA GRANT FROM YORK UNIVERSITY: COMPUTATIONAL, BEHAVIORAL, AND NEUROIMAGING APPROACHES TO DECODING HUMAN SCENE PROCESSING. (PI: DR. SHAYNA ROSENBAUM)**

GRANT: \$50,000

AWARDS

2018 - 2021: **CANADIAN INSTITUTE OF HEALTH RESEARCH (CIHR) POSTDOCTORAL FELLOWSHIP**

FELLOWSHIP: \$40,000/YEAR * 3 YEARS = \$120,000 (DECLINED DUE TO EMPLOYMENT AT **UM-DEARBORN, MICHIGAN**)

2017 – 2019 **VISTA Post-doctoral fellowship (York University, Toronto)**

Award value: \$55,000 (fellowship) + \$7500 + \$1000 (allowance) per year

(2018-2019 fellowship DECLINED DUE TO EMPLOYMENT AT **UM-DEARBORN, MICHIGAN**)

2013 - 2014 **Doctoral Thesis Completion Award (OISE/University of Toronto)**

Award value: \$20,000 +Tuition

2009 - 2012 **Natural Sciences and Engineering Research Council of Canada (NSERC PGS D)**

Award value: \$57,000 in total

2009 - 2012 **Excellence Recognition Award (OISE/University of Toronto)**

Award value: \$6,000

2008 - 2009 **Natural Sciences and Engineering Research Council of Canada (NSERC CGS M)**

Award value: \$17,500

2008 - 2009 **Ontario Graduate Scholarship (declined in favor of NSERC award)**

Award value: \$1,5000

2008 - 2009 Excellence Recognition Award (OISE/University of Toronto)

Award value: \$2,000

2006-2007 Canada Millennium Scholarship (Concordia University, Montreal)

Award value \$400 cash + \$4000 Bursary

2005 - 2007 Arts and Science Scholar Award (Concordia University, Montreal)

Award value: \$150

2005 Leslie and Kaye Jowett Scholarship (Concordia University, Montreal)

Award value \$2,375

MANUSCRIPTS IN PREPARATION

Liu Z.-X., & Ryan, J. (**In preparation**). Aging effects on associative memory processing: An eyetracking study

Liu Z.-X., Grady C., & Moscovitch, M. (**In manuscript**). Easily learned, easily remembered: A judgement of learning (JOL) heuristic has its neurobiological foundations.

MANUSCRIPTS SUBMITTED

Woltering, S., Gu, C, Liu Z.-X., & Tannock, R. (Under review). Visuospatial Working Memory Capacity in the Brain after Working Memory Training in Adult ADHD: A Randomized Controlled Trial

REFEREED PUBLICATIONS

Gu, C, Liu Z.-X., Tannock, R, & Woltering, S. (**2018**). Neural Processing of Working Memory in Adults with ADHD in a Visuospatial Change Detection Task with Distractors. *PeerJ*.

Liu Z.-X., Shen K., Olsen R.K., & Ryan J.D. (**2018**). Ageing effects on fixation modulations of hippocampal activity during face processing. *Neuropsychologia*, 119, 81-91.

- Brunec, I. K., Bellana, B., Ozubko, J. D., Man, V., Robin, J., **Liu, Z.-X.**, ... Moscovitch, M. (2018). Multiple Scales of Representation along the Hippocampal Anteroposterior Axis in Humans. *Current Biology*, 28, 2129-2135.e6
- Liu, Z.-X.**, Grady, C., & Moscovitch, M. (2018). The effect of prior knowledge on post-encoding brain connectivity and its relation to subsequent memory. *NeuroImage*, 167, 211–223. doi:10.1016/j.neuroimage.2017.11.032
- Liu Z.-X.**, Shen K., Olsen R.K., & Ryan J.D. (2017). Visual sampling predicts hippocampal activity. *Journal of Neuroscience*. 37, 599-609. doi: 10.1523/JNEUROSCI.2610-16.2017
- Liu, Z.-X.**, Grady, C., & Moscovitch, M. (2017). Effects of Prior-Knowledge on Brain Activation and Connectivity During Associative Memory Encoding. *Cerebral Cortex*, 27, 1991–2009. doi:10.1093/cercor/bhw047
- Bellana, B.***, **Liu, Z.-X.***, Diamond, N. b., Grady, C. I., & Moscovitch, M. (2017). Similarities and differences in the default mode network across rest, retrieval, and future imagining. *Human Brain Mapping*, 38, 1155–1171. doi:10.1002/hbm.23445 (* **Co-first and correspondence author with equal contributions. First authors are listed in alphabetical order.**)
- Liu, Z.-X.**, Lishak, V., Tannock, R., & Woltering, S. (2017). Effects of working memory training on neural correlates of Go/Nogo response control in adults with ADHD: A randomized controlled trial. *Neuropsychologia*, 95, 54–72. doi:10.1016/j.neuropsychologia.2016.11.023
- Buddhika, B., **Liu, Z.X.**, Anderson, J., Moscovitch, M., & Grady, C. (2015). Laterality effects in functional connectivity of the angular gyrus during rest and episodic retrieval. *Neuropsychologia*. 80, 24 - 34. doi:10.1016/j.neuropsychologia.2015.11.004
- Liu Z.-X.**, Glizer, D., Tannock, R., & Woltering, S. (2015). EEG alpha power during maintenance of information in working memory in adults with ADHD and its plasticity due to working memory training: A randomized controlled trial. *Clinical Neurophysiology*. 127, 1307- 1320.
- Woltering, S., Liao, V., **Liu, Z.-X.**, & Granic I. (2015). Neural rhythms of change: Long-term changes after treatment in children with disruptive behavior problems. *Neural Plasticity*. e873197. doi:10.1155/2015/873197

- Liu, Z.-X.**, Woltering, S., & Lewis, M. D. (2014). Developmental change in EEG theta activity in the medial prefrontal cortex during cognitive control. *NeuroImage*, *85*, 873 - 887.
doi:10.1016/j.neuroimage.2013.08.054
- Kim, S., **Liu, Z.-X.**, Glizer, D., Tannock, R., & Woltering, S. (2014). Adult ADHD and working Memory: Neural evidence of impaired encoding. *Clinical Neurophysiology*. *125*, 1596 - 1603.
doi:10.1016/j.clinph.2013.12.094
- Woltering, S., **Liu, Z.-X.**, Rokeach, A., & Tannock, R. (2013). Neurophysiological differences in inhibitory control between adults with ADHD and their peers. *Neuropsychologia*, *51*, 1888 - 1895.
doi:10.1016/j.neuropsychologia.2013.06.023
- Woltering, S., Bazargani, N., & **Liu, Z.-X.** (2013). Eye blink correction: A test on the preservation of common ERP components using a regression based technique. *PeerJ*, *1*, e76.
doi:10.7717/peerj.76
- Woltering, S., Jung, J., **Liu, Z.-X.**, & Tannock, R. (2012). Resting state EEG oscillatory power differences in ADHD college students and their peers. *Behavioral and Brain Functions*, *8*, 1 - 9.
doi:10.1186/1744-9081-8-60
- Lewis, M. D., & **Liu, Z.-X.** (2011). Three time scales of neural self-organization underlying basic and nonbasic emotions. *Emotion Review*, *3*, 416 - 423. doi:10.1177/1754073911410748

REFEREED ABSTRACTS & POSTERS

- Liu Z.-X.**, Shen K., Olsen R.K., & Ryan J.D. (2017, March). Visual sampling predicts hippocampal activity. Poster presented at the 24th annual Cognitive Neuroscience Society meeting, San Francisco, California, USA.
- Bellana, B.***, **Liu, Z.-X.***, Diamond, N., Grady, C.L., Levine, B., & Moscovitch, M. (2015, March). Similarities and differences in the DMN across rest, retrieval and future imagining. Poster presented at the 25th Annual Rotman-Baycrest Neuroscience Conference. Toronto, ON, CAN. * Equal contributions.
- Bellana, B.***, **Liu, Z.-X.***, Diamond, N., Grady, C.L., Levine, B., & Moscovitch, M. (2015). Characterizing the default mode network across rest, retrieval and future imagining. Poster to be presented at

the Annual Meeting of the Organization for Human Brain Mapping 2015. Honolulu, HI, USA, June 18, 2015. * Equal contributions

Bellana, B., **Liu, Z.-X.**, Anderson, J. A. E., Moscovitch, M., & Grady, C. L. (2014, Nov). Functional connectivity of the angular gyrus during rest and recall: Laterality effects in the recollection network. Poster presented at the Annual Meeting of the Society for Neuroscience 2014. Washington, DC, USA.

Liu, Z.-X., Grady, C., & Moscovitch, M. (2014, Nov). Prior knowledge effect on post-encoding brain connectivity and its relation to subsequent memory. Poster presented at Society for Neuroscience Annual Meeting, Washington D.C. USA.

Bellana, B., **Liu, Z.-X.**, Anderson, J. A. E., Moscovitch, M., & Grady, C. L. (2014, Jul). Left to recollect Laterality differences in whole-brain functional connectivity of the angular gyrus during rest and recall. Poster presented at the 24th Annual Canadian Society for Brain, Behaviour and Cognitive Science. Toronto, ON, CAN.

Rokeach, A., Woltering, S., **Liu, Z.-X.**, & Tannock, R. (2013, April). Electrophysiological differences in inhibitory control between ADHD adults and their peers. Poster presented at the 20th annual Cognitive Neuroscience Society meeting, San Francisco, California, USA.

Kim, S., **Liu, Z.-X.**, Glizer, D., Tannock, R., & Woltering, S. (2013, April). Do adults with attention deficit/hyperactivity disorder have problems in working memory? Poster presented at the 20th annual Cognitive Neuroscience Society meeting, San Francisco, California, USA.

Glizer, D., Kim, S., **Liu, Z.-X.**, Tannock, R., & Woltering, S. (2012, October). ADHD and Working Memory: neural correlates of impaired processing. Poster presented at the 59th annual meeting of the American Academy of Child and Adolescent Psychiatry, San Francisco, California, USA.

Jung, J., Woltering, S., **Liu, Z.-X.**, & Tannock R. (2012, April). Resting state EEG oscillatory power differences in ADHD college students and their peers. Poster presented at the 19th annual Cognitive Neuroscience Society meeting, Chicago, USA.

Liu, Z. X., & Lewis, M. D. (2010, April). Improving cortical efficiency with age: An electroencephalography (EEG) study of cortical activity during response inhibition. Poster presented at the 17th annual Cognitive Neuroscience Society meeting, Montreal, Quebec, Canada.

Woltering, S., Liu, Z. X., Bazargani, N., & Lewis, M. D. (2010, April). Eye blink correction: a test on the preservation of common ERP components. Poster presented at the 17th annual Cognitive Neuroscience Society meeting, Montreal, Quebec, Canada.

Liu, Z. X., & Forman, D. R. (2007, June). Predictors of compliance in toddlers: children's effortful control, parenting behaviour, and parenting cognitions. Poster presented at the 68th annual convention of the Canadian Psychological Association, Ottawa, Ontario.

Gosselin, M. P., Forman, D. R., & Liu, Z. X. (2007, March). Toddler compliance and eager imitation: Do task characteristics moderate the generality of child readiness to be socialized? Poster presented at the biennial meeting of the Society for Research in Child Development, Boston, Massachusetts.

NON-REFEREED POSTERS/PRESENTATIONS

Liu, Z.-X., Grady, C., & Moscovitch, M. (2013, June). *Neural bases for subjective sense of task difficulty in associative processing*. Poster presented at the Collaborative Program in Neuroscience Annual Research Day. University of Toronto (Outstanding Poster Presentation).

Liu, Z.-X., & Lewis, M. D. (2009, April). *Brain signal variability and behavioral performance in children*. Poster presented at the Collaborative Program in Neuroscience Annual Research Day. University of Toronto.

UNPUBLISHED THESES

Liu, Z. X. (2015). *Prior-knowledge Effects on Associative Memory Processing*. Unpublished PhD thesis, University of Toronto, Toronto, Ontario, Canada. (Supervisor: Dr. Morris Moscovitch)

Liu, Z. X. (2010). *Developmental change in frontal neuronal oscillations during response inhibition*. Unpublished Master thesis, University of Toronto, Toronto, Ontario, Canada. (Supervisor: Dr. Marc D. Lewis)

Liu, Z. X. (2006). *Predictors of compliance in toddlers: children's effortful control, parenting behaviour, and parenting cognition*. Unpublished undergraduate honours thesis, Concordia University, Montreal, Quebec, Canada. (Supervisor: Dr. David R. Forman)

Liu, Z. X. (2005). *Infant emotionality as predictor of compliance and collaborative motivation in early childhood: A longitudinal analysis*. Unpublished undergraduate research experience project, Concordia University, Montreal, Quebec, Canada. (Supervisor: Dr. David R. Forman)

TEACHING & SUPERVISION EXPERIENCE

Teaching:

Jan - May 2017 Course instructor for PSYC 3265: Memory, York University

Teaching assistant:

Sept - Dec 2014 For ADP1288H: Intermediate Statistics, University of Toronto
Course instructor: Dr. Kang Lee,

Sept - Dec 2008 For HDP3286H: Developmental Neurobiology, University of Toronto
Course instructor: Dr. Marc Lewis,

Guest lectures:

Mar, 2017 Neural plasticity related to learning/memory and, education.
For APD 1209H: Research Methods and Thesis Preparation in Applied Psychology and Human Development, University of Toronto.
Course instructor: Dr. Becky Xi Chen,

Oct, 2014 Statistics: Simple and Multiple regression (two lectures).
For APD 1288H: Intermediate Statistics in Applied Psychology and Human Development, University of Toronto.
Course instructor: Dr. Kang Lee,

Oct 17th, 2012 An introduction to neural imaging methods: EEG and fMRI.
For APD 1209H: Research Methods and Thesis Preparation in Applied Psychology and Human Development, University of Toronto.
Course instructor: Dr. Becky Xi Chen,

Workshop instructor:

Jan -March, 2017 Rotman Eye-Tracker Curriculum Series (Attendee evaluation: 4.63/5)
July 20th, 2016 Rotman summer rounds: Research skills (Attendee evaluation: 4.34/5)

Sept - Nov 2012 An introduction to Matlab.
For Members of Working Memory Training Project group

in Dr. Rosemary Tannock Lab

Undergraduate supervision:

Jan 2018 - August 2018	Mandy Ding in Dr. Jennifer Ryan lab
Dec 2017 – August 2018	Maria Mohmand in Dr. Jennifer Ryan lab
	Junghyun Nam in Dr. Jennifer Ryan lab
May 2017 - August 2018	Amir Zarie in Dr. Jennifer Ryan and Dr. Shayna Rosenbaum lab (help supervising honour thesis)
	Amir Rezvani in Dr. Jennifer Ryan lab
	Alireza Tajadod in Dr. Jennifer Ryan lab
Dec 2016 - August 2018	Jennifer Petryschuk in Dr. Jennifer Ryan lab
	Ryan Aloysius in Dr. Jennifer Ryan lab (help supervising honour thesis)
June 2016 – August 2018	Emilia Sherifi in Dr. Jennifer Ryan lab (supervising Emilia Sherifi's Independent Research Project, May – August 2017)
October 2015 - August 2018	Mariam Aziz in Dr. Jennifer Ryan lab
Dec 2016 – May 2017	Olga Khazov in Dr. Jennifer Ryan lab (now in graduate school)
June 2016 - January 2017	Melissa Colaluca in Dr. Jennifer Ryan lab (now in medical school)
Dec 2015 – January 2017	Alvina Anantram in Dr. Jennifer Ryan lab
May 2014 - August 2014	Joseph Blommesteyn in Dr. Morris Moscovitch lab
May 2013 - May 2014	Yasmin Ghodse-Elahi in Dr. Morris Moscovitch lab
Sept 2011 - April 2012	Roxana Florica in Dr. Morris Moscovitch lab
Sept 2010 - April 2011	Jessica Jung in Dr. Marc Lewis lab (supervising Jessica Jung's independent research project)

INVITED TALKS

2018. 01.23 *Understanding the role of the hippocampus in binding visual memory* at Toronto Western Hospital Neuroimaging Round. Toronto Western Hospital, Toronto.
2015. 05.05 *Prior knowledge effects on associative familiarity and recollection* at the Toronto Area Memory Group (TAMeG) meeting. University of Toronto.
2015. 03.18 *Easily learned, easily remembered' heuristic has its neural foundation* at Ebbinghaus Empire Data Blitz meeting, Psychology Department, University of Toronto.
2013. 11.22 *Prior experience effects on brain activation and connectivity during associative encoding* at Toronto Western Hospital Neuroimaging Round. Toronto Western Hospital, Toronto.

PROGRAMMING SKILLS

General: MATLAB, familiar with R, Python, and Fortran

Neuroimaging: SPM, EEGLAB, familiar with AFNI, FSL, Fieldtrip

NATIONALITY

Canadian

LANGUAGES

English and Mandarin