

Alexandra L. Decker
alexandradecker.com
alexandraleerdecker@gmail.com
adecker@mit.edu

Employment

Post-doctoral Fellow, Massachusetts Institute of Technology 2022-
Department of Brain and Cognitive Sciences
Advisor: John D.E. Gabrieli

Education

Ph.D., University of Toronto 2021
Department of Psychology
Advisors: Katherine Duncan, Amy Finn
Committee: Keisuke Fukuda, Lynn Hasher, Michael Esterman, Jay Pratt

M.A., University of Toronto, and the Hospital for Sick Children 2016
Department of Psychology
Advisor: Donald Mabbott
Committee: Morgan Barense, Amy Finn

B.A., McGill University 2013
Major: Psychology and Behavioural Science

Research Interests

Social Determinants of Health, Socioeconomic Status, Academic Achievement, Cognitive and Brain Development, Learning and Memory, Sustained and Selective Attention, ADHD, Neural Plasticity, Neuromodulators (acetylcholine, norepinephrine)

Awards, Scholarships, and Grants

Banting Postdoctoral Fellowship (\$140,000; 10% success rate)	2025-2027
Flux "People's Choice" Poster Award	2024
Flux Travel Award (Conference Registration + \$500)	2024
MIT Spot Award (for community members who enhance the workplace)	2024
Natural Sciences and Engineering Research Council of Canada (\$90,000) (<i>Top 20% of awarded proposals</i>)	2022-2024
William Line Memorial Graduate Scholarship, University of Toronto (\$8000)	2020-2021
Doctoral Completion Award (\$8000), University of Toronto	2020-2021

Ontario Graduate Scholarship (\$15,000), Ontario, Canada	2020-2021
Dataquest Underrepresented Genders Scholarship	2020
Ontario Graduate Scholarship (\$15,000), Ontario, Canada	2019-2020
Canadian Institutes of Health Research Project Grant (\$1,147,500)	2018-2022
Brain Canada-Kids Brain Health Network Training Award (\$70,000)	2018-2020
School of Graduate Studies Conference Grant (\$450), University of Toronto	2017
School of Graduate Studies Conference Grant (\$1,100), University of Toronto	2016

Peer-Reviewed Publications (7 first author, 2 first author under review)

+equal contributions

^trainees

Under Review

Biba, T., **Decker, A.**, Herrmann, B., Fukuda, K., Katz, C., Valiante, T., Duncan, K.
Memory's pulse: episodic memory formation is theta rhythmic. (*Under Review at Nature Human Behaviour*)

Decker, A. L., Leonard, J.⁺, Romeo, R.⁺, Itiat, J.[^], Hubbard, N. A., Bauer, C. C. C., Grotzinger, H., Giebler, M. A., Torres, Y. C., Imhof, A., & Gabrieli, J. D. E. (2024). Exploration Explains Socioeconomic Disparities in Learning and Academic Achievement (*Revise and re-submit at Nature Communications*)

Decker A., Tandoc, M., Cho, H., Rebello, G., Mabbott, D., Duncan, K.⁺, Finn, A.S.⁺ Children's Darting (Not Diffuse) Attentional Spotlight Reduces Memory Selectivity for Relevant Content (*Under Review at Developmental Science*)

2024

Treves, I. N., Marusak, H. A., **Decker, A.**, Kucyi, A., Hubbard, N. A., Bauer, C. C. C., Leonard, J., Grotzinger, H., Giebler, M. A., Torres, Y. C., Imhof, A., Romeo, R., Calhoun, V. D., & Gabrieli, J. D. E. (2024). Dynamic functional connectivity correlates of trait mindfulness in early adolescence. *Biological Psychiatry Global Open Science*, 100367. <https://doi.org/10.1016/j.bpsgos.2024.100367>

Decker, A. L., Meisler, S. L., Hubbard, N. A., Bauer, C. C. C., Leonard, J., Grotzinger, H., Giebler, M. A., Torres, Y. C., Imhof, A., Romeo, R., & Gabrieli, J. D. E. (2024). Striatal and Behavioral Responses to Reward Vary by Socioeconomic Status in Adolescents. *Journal of Neuroscience*. <https://doi.org/10.1523/JNEUROSCI.1633-23.2023>

Hurtado, H.⁺, Hansen, M.⁺, Strack, J.⁺, Vainik, U., **Decker, A. L.**, Khundrakpam, B., Duncan, K., Finn, A. S., Mabbott, D. J., & Merz, E. C. (2024). Polygenic risk for depression and anterior and posterior hippocampal volume in children and adolescents. *Journal of Affective Disorders*, 344, 619–627. <https://doi.org/10.1016/j.jad.2023.10.068>

February 15, 2025

2023

Decker, A. L., Duncan, K.⁺, & Finn, A. S.⁺ (2023). Fluctuations in Sustained Attention Explain Moment-to-Moment Shifts in Children's Memory Formation. *Psychological Science*, 34(12), 1377–1389. <https://doi.org/10.1177/09567976231206767>

Decker, A.⁺, Dubois, M.⁺, Duncan, K.⁺, & Finn, A. S.⁺ (2023). Pay attention and you might miss it: Greater learning during attentional lapses. *Psychonomic Bulletin & Review*, 30(3), 1041–1052. <https://doi.org/10.3758/s13423-022-02226-6>

2022 and earlier

Decker, A., Duncan, K.⁺, Finn, A. S.⁺, & Mabbott, D. J.⁺ (2020). Children's family income is associated with cognitive function and volume of anterior not posterior hippocampus. *Nature Communications*, 11(1), 4040. <https://doi.org/10.1038/s41467-020-17854-6>

Decker, A., Finn, A.⁺, & Duncan, K.⁺ (2020). Errors lead to transient impairments in memory formation. *Cognition*, 204, 104338. <https://doi.org/10.1016/j.cognition.2020.104338>

Decker, A., & Duncan, K. (2020). Acetylcholine and the complex interdependence of memory and attention. *Current Opinion in Behavioral Sciences*, 32, 21–28. <https://doi.org/10.1016/j.cobeha.2020.01.013>

Medeiros, C. B. de, Moxon-Emre, I., Scantlebury, N., Malkin, D., Ramaswamy, V., **Decker, A.**, Law, N., Kumabe, T., Leonard, J., Rubin, J., Jung, S., Kim, S.-K., Gupta, N., Weiss, W., Faria, C. C., Vibhakar, R., Lafay-Cousin, L., Chan, J., Kros, J. M., ... Mabbott, D. J. (accepted). Medulloblastoma has a global impact on health-related quality of life: Findings from an international cohort. *Cancer Medicine*. <https://doi.org/10.1002/cam4.2701>

Sekeres, M. J., Riggs, L., **Decker, A.**, Medeiros, C. B. de, Bacopulos, A., Skocic, J., ... Frankland, P. W. (2018). Impaired recent, but preserved remote, autobiographical memory in pediatric brain tumor patients. *Journal of Neuroscience*, 1056–18. <https://doi.org/10.1523/JNEUROSCI.1056-18.2018>

Oyefiade, A. A., Ameis, S., Lerch, J. P., Rockel, C., Szulc, K. U., Scantlebury, N., **Decker, A.**, Jefferson, J., Spichak, S., & Mabbott, D. J. (2018). Development of short-range white matter in healthy children and adolescents. *Human Brain Mapping*, 39(1), 204–217. <https://doi.org/10.1002/hbm.23836>

Decker, A., Szulc, K. U., Bouffet, E., Laughlin, S., Chakravarty, M. M., Skocic, J., Mabbott, D. J. (2017). Smaller hippocampal subfield volumes predict verbal associative memory in pediatric brain tumor survivors. *Hippocampus*. <https://doi.org/10.1002/hipo.22758>

Talks

Decker, A.L., Duncan, K.⁺, Finn, A.S.⁺ (May 2024). Fluctuations in Sustained Attention Shape Moment-to-Moment Shifts in Children's Memory Formation. Association for Psychological Science Annual Convention. San Fransisco, CA.

Itiat, J.[^], **Decker, A. L.**, Gabrieli, J. D. E. (April 2024). Exploration is Associated with Socioeconomic Disparities in Learning and Academic Achievement. Cognitive Neuroscience Society. Toronto, Canada

Decker, A.L., Gabrieli, J.G. (April 2024). Socioeconomic Status Influence Exploration, Learning, and Reward Processing in Children and Adolescents. The Psychology and Economics of Poverty Meeting. Berkeley, CA.

Decker, A.L., Gabrieli, J.G. (May 2023). Socioeconomic status and the development of the reward system. Environmental and Social Determinants of Child Mental Health Symposium. The Picower Institute of Learning and Memory, Massachusetts Institute of Technology, Cambridge, MA.

Biba, T., **Decker, A.**, Herrmann, B., Fukuda, K., Katz, C., Valiante, T., Duncan, K. (2022). Memory's pulse: theta rhythmic sampling underlies episodic memory formation. Columbia Memory Group meeting, New York, NY.

Biba, T., **Decker, A.**, Herrmann, B., Fukuda, K., Katz, C., Valiante, T., Duncan, K. (2022). Memory's pulse: theta rhythmic sampling underlies episodic memory formation. Temple Memory Group meeting, Philadelphia, PA.

Decker, A.L., Duncan, K+., Finn, A+. (March 2021) How do spontaneous attentional fluctuations influence learning and memory in children and adults? Columbia University, New York, NY.

Decker, A.L., Duncan, K+., Finn, A+. (March 2021) The costs and benefits of attentional lapses on learning and memory in children and adults. Haskins Laboratories, New Haven, CT

Decker, A.L., Duncan, K+., Finn, A+., (February 2020) How do attentional fluctuations influence memory encoding? Developmental Interest Group meeting, University of Toronto, Toronto

Decker, A.L., Duncan, K+., Finn, A+., Mabbott, D.J+., (March 2019) Parental income alters development of anterior, but not posterior hippocampus. Society for Research in Child Development, Baltimore, MD

Decker, A.L., Duncan, K+., Finn, A+., Mabbott, D.J+., (March 2019) Socioeconomic status and the anterior hippocampus. Developmental interest group meeting, University of Toronto, Toronto

Decker, A.L., Finn, A.S+., Duncan, K+., (May 2018). Attentional states influence memory encoding. Research presented at the 2018 Annual Toronto Area Memory Group Meeting, Toronto, Canada

Decker, A.L., Szulc, K. U., Bouffet, E., Laughlin, S., Chakravarty, M. M., Skocic, J.,...Mabbott, D. J. (April 2017). The development of hippocampal subfields in healthy children and adolescents. 2017 Annual Neuroimaging round data blitz meeting at the Hospital for Sick Children, Toronto, Canada.

Decker, A.L., Szulc, K. U., de Medeiros, C. B., Skocic, J., Mabbott, D. J., (May 2016). Hippocampal subfield volumes in pediatric brain tumor survivors. Research presented at the Annual Collaborative Program in Neuroscience Research Day, University of Toronto, Canada

Posters

Decker, A. L., Leonard, J., Romeo, R., Itiat, J., Hubbard, N. A., Bauer, C. C. C., Grotzinger, H., Giebler, M. A., Torres, Y. C., Imhof, A., , & Gabrieli, J. D. E. (October 2024). Exploration is Associated with Socioeconomic Disparities in Learning and Academic Achievement. FLUX, Baltimore, MD

Decker, A. L., Itiat, J.[^], Meisler, S. L., Hubbard, N. A., Bauer, C. C. C., Leonard, J., Grotzinger, H., Giebler, M. A., Torres, Y. C., Imhof, A., Romeo, R., & Gabrieli, J. D. E. (October 2024). Striatal and Behavioral Responses to Reward Vary by Socioeconomic Status in Adolescents. MIT Scientific Advisory Board Poster Session, Cambridge, MA.

Itiat, J.[^], **Decker, A. L.**, Gabrieli, J. D. E. (April 2024). Exploration is Associated with Socioeconomic Disparities in Learning and Academic Achievement. Cognitive Neuroscience Society. Toronto, Canada

Decker, A.L., Tandoc, M., Cho, H., Rebello, G., Duncan, K.⁺, Finn, A.⁺ (April 2024). Darting Not Diffuse: Immature Selective Attention Boosts Memory in Childhood. Cognitive Neuroscience Society. Toronto, Canada

Decker, A., Meisler, S.L., Gabrieli, J.D.E. Reward responses in behavior and the striatum vary in relation to socioeconomic status in adolescents. Reinforcement Learning at Harvard Meeting, Cambridge, MA (August 2023)

Decker, A., Meisler, S.L., Gabrieli, J.D.E.⁺, Ofen, N.⁺, Chai, X.⁺ Costs of Cognitive Control: Task Switching Impairs Memory More in Children than Adults. Organization for Human Brain Mapping, Montreal, Quebec, Canada (July, 2023)

Decker, A., Tandoc, M., Cho, H., Rebello, G., Duncan, K.⁺, Finn, S. A.⁺. Shifting Focus: The Advantage of Children's Poor Selective Attention for Learning. Brain and Cognitive Sciences Retreat, Cape Cod, Massachusetts (June, 2023).

Dubois, M.⁺, **Decker A.**, Duncan K., Finn A.S. Lapses in attention facilitate peripheral learning. Poster presented at 2021 Workshop on Mental Effort, 2021. [virtual].

Decker, A., Finn, S. A.⁺, Duncan, K.⁺ How we learn from our mistakes: Errors lead to transient impairments and then enhancements in memory formation. Virtual Vision Sciences Society Meeting (June, 2020).

Dubois M, **Decker A**, Duncan K.⁺, Finn A.S.⁺ Learning more when attending less: Poor attentional states enhance peripheral learning. Poster presented at: Cognitive Neuroscience Society Annual Meeting, 2020, Boston.

Decker, A., Duncan, K.⁺, Finn, S. A.⁺, Attention Matters More: In Kids, Attentional State Predicts Memory Better Than in Adults. Context and Episodic Memory Symposium, Philadelphia, PA (May 2019).

Decker, A., Duncan, K.⁺, Finn, S. A.⁺, Attention Matters More: In Kids, Attentional State Predicts Memory Better Than in Adults. Biennial meeting for Research in Child Development, Baltimore, MD (March 2019).

Decker, A., Finn, S. A.⁺, Duncan, K.⁺. How do developmental shifts in attentional control influence memory encoding? Cognitive Neuroscience Society Conference, Boston MA (April 2018).

Decker A., Skocic J, Finn A, Mabbott DJ., Age-related changes in hippocampal subfields and white matter across childhood and adolescence. Annual Meeting of the Organization for Human Brain Mapping, Vancouver, BC. (June 2017).

Decker A., Skocic J, Finn A, Mabbott DJ. Age-related changes in hippocampal subfields and white matter across childhood and adolescence. 11th Annual Canadian Association for Neuroscience Meeting, Montreal, QC. (May 2017).

Decker, A., Szulc, K., Skocic, J., de Medeiros, C., Riggs, L., Bouffet, E., ... Mabbott, D. (2016). Impact of cranial radiation therapy on hippocampal subfield volumes and declarative memory in pediatric brain tumor survivors. *Neuro-Oncology*, 18(suppl_3), iii158–iii158.
<https://doi.org/10.1093/neuonc/now081.58>

Decker A., Szulc K, Skocic J, de Medeiros C, Riggs L, Bouffet E, Dockstader C, Laughlin S, Mabbott D. Hippocampal subfield volume loss in children and adolescent survivors of pediatric brain tumors. Canadian Association for Neuroscience Conference, Toronto, ON (May 2016).

Decker A., Szulc K, Skocic J, de Medeiros C, Riggs L, Bouffet E, Dockstader C, Laughlin S, Mabbott D. Hippocampal subfield volume loss in children and adolescent survivors of pediatric brain tumors. Centre for Brain and Mental Health Day, Toronto, ON (April 2016).

Oyefiade A, Ameis S, Scantlebury N, **Decker A.**, Szulc K, Mabbott DJ. Developmental characterization of sub-cortical white matter tracts. 23rd International Society for Magnetic Resonance Imaging in Medicine, Toronto, ON (June 1, 2015).

Moxon-Emre, I., Scantlebury, N., Taylor, M.D., Bouffet, E., Malkin, D., Laughlin, S., Law, N., Kumabe, T., Leonard, J., Rubin, J., Jung, S., Kim, S., Gupta, N., Weiss, W., Faria, C., Vibhakar, R., Spiegler, B., Janzen, L., Liu, F., **Decker, A.**, Mabbott, D. Long-term outcome in subgroups of medulloblastoma. 16th International Symposium on Pediatric Neuro-Oncology (ISPNO), Singapore. *Neuro-Oncology* 2014; 16(Suppl 1): i99-i104.

Teaching Experience

Teaching Assistant, Introduction to Psychology (Psy100), University of Toronto	2021
Teaching Assistant, Cognitive Psychology (PSY270), University of Toronto	2020
Teaching Assistant, Introduction to Psychology (PSY100), University of Toronto	2019
Teaching Assistant, Introduction to Development (PSY210), University of Toronto	2018
Teaching Assistant, Learning and Plasticity (PSY260), University of Toronto	2017
Guest Lecturer, Learning and Plasticity (PSY260), University of Toronto	2017
Teaching Assistant, Psychology, and the Law (PSY328), University of Toronto	2017
Teaching Assistant, Human Memory (PSY372), University of Toronto	2016
Teaching Assistant, Health Psychology (PSY333), University of Toronto	2015
Guest Lecturer, Health Psychology (PSY333), University of Toronto	2015

Volunteer Experience and Academic Service

February 15, 2025

Openmind Representative	2024
Tour Guide for Veterans, fMRI Control Room at Martinos Imaging Center	2024
Tour Guide, Mock Scanning Room at Martinos Imaging Center	2024
Workshop Leader, Evaluating Scientific Evidence for Kids	2023
Science Mentor, Frontiers for Young Minds	2023
Student Voice Survey Organizer, Psychology Graduate Student's Association	2021
Vice President of the Psychology Graduate Student's Association	2020-2021
Volunteer Analytics Consultant	2019-2021
Census Committee Coordinator, University of Toronto Student's Association	2019-2020
Graduate student Mentor, University of Toronto Peer Mentorship Program	2019-2020
Let's Talk Science Volunteer, Let's Talk Science	2017
International Conference of Cognitive Neuroscience Volunteer Committee Member	2017
Volunteer, Toronto Rehabilitation Institute	2013
Volunteer, Toronto Western, Geriatric Mental Health Outreach Program	2012-2013
Big Brothers Big Sisters, Montreal	2009-2012

Skills

Experimental design, time series analyses, multi-level modelling, statistics, Psychopy experiment builder, R, Python (pandas, numpy, nilearn), EyeLink Software (eye tracking and pupillometry), functional resonance imaging data

Ad Hoc Reviewer

Journal of Cognitive Neuroscience
 Perspectives in Psychological Science
 Psychological Science
 Neuroimage
 Psychonomic Bulletin and Review
 Journal of Experimental Psychology: General
 Journal of Experimental Psychology: Human Perception and Performance