**Alexandra L. Decker**

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**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) 2022-2024

*(Top 20% of awarded proposals)*

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>

**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 Medieros, 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**

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