

Rebecca Merkley

Assistant Professor (term)

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Education

- 2011-2015 DPHIL in Experimental Psychology
University of Oxford | Advisor: Professor Gaia Scerif
- 2010-2011 EdM in Mind, Brain, and Education
Harvard Graduate School of Education
- 2005-2009 BA (HONS) in Psychology, Minor in French
University of Western Ontario

Academic Employment

- 2018- Assistant Professor, Institute of Cognitive Science
Carleton University
- 2015-2018 Postdoctoral Research Fellow, Brain and Mind Institute
University of Western Ontario | Advisor: Professor Daniel Ansari

Consultancies & Contract Research

- 2020- International Science and Evidence-based Education Assessment (ISEEA) Fellow, UNESCO
Mahatma Gandhi Institute of Education for Peace and Sustainable Development
- 2018-2020 Expert Contributor, [EF + Math Program](#)
Behavioural Insights Team - [Tig App](#)

Professional Honours & Awards

- 2020 Carleton University Students' Association Teaching Excellence Award
- 2016-2018 Developmental Neuroscience Postdoctoral Research Training Award, Brain Canada and NeuroDevNet.
- 2013-2015 Postgraduate Scholarship, Natural Sciences and Engineering Research Council of Canada.
- 2011-2014 Clarendon Fund Scholarship, University of Oxford.
- 2014 National Science Foundation-sponsored Distinguished Student Poster Award, International Mind, Brain, and Education Society Conference
- 2014 Poster Award, European Association of Research on Learning and Instruction: SIG22 Neuroscience and Education Meeting
- 2011 Mind, Brain, Behavior Graduate Student Research Award, Harvard University.

Publications

ARTICLES IN REFEREED JOURNALS

- Lau, N. T., **Merkley, R.**, Tremblay, P. F., Zheng, S., De Jesus, S., & Ansari, D. (in press). Kindergarteners' Symbolic Number Abilities Predict Non-Symbolic Number Abilities and Math Achievement in Grade 1.
- Yeo, D. J., Pollack, C., **Merkley, R.**, Ansari, D., & Price, G. R. (2020). The "Inferior Temporal Numeral Area" distinguishes numerals from other character categories during passive viewing: A representational similarity analysis. *NeuroImage*. DOI:10.1016/j.neuroimage.2020.116716
- Merkley, R.**, Conrad, B., Price, G., & Ansari, D. (2019). Investigating the visual number form area: A replication study. *Royal Society Open Science*. DOI: 10.1098/rsos.182067
- von Spreckelsen, M., Dove, E., Coolen, I., Dowker, A., Sylva, K., Ansari, D., **Merkley, R.**, Mills, A., Murphy, V., & Scerif, G. (2019). Let's Talk about Maths: The Role of Observed 'Maths-Talk' and Environmental Resources in Pre-schoolers' Numeracy. *Mind, Brain, and Education*. DOI:10.1111/mbe.12221
- Matusz, P.J., **Merkley, R.**, Faure, M., & Scerif, G. (2019). Expert Attention: Attentional allocation depends on the differential development of multisensory number representations. *Cognition*. DOI: 10.1016/j.cognition.2019.01.013
- Merkley, R.**, Shimi, A., & Scerif, G. (2016). Electrophysiological markers of newly acquired symbolic numerical representations: The role of magnitude and ordinal information. *ZDM*. 48 (3), 279-289. DOI: 10.1007/s11858-015-0751-y
- Merkley, R.**, Thompson, J., & Scerif, G. (2016). Of huge mice and tiny elephants: Exploring the relationship between inhibitory processes and preschool math achievement. *Frontiers in Psychology*. 6:1903. DOI: 10.3389/fpsyg.2015.01903
- Merkley, R.**, & Scerif, G. (2015). Continuous visual properties of number influence the formation of novel symbolic representations. *Quarterly Journal of Experimental Psychology*. 68(9), 1860-1870. DOI: 10.1080/17470218.2014.994538
- Matusz, P.J., Broadbent, H., Ferrari, J., Forrest, B., **Merkley, R.**, & Scerif, G. (2015). Multi-modal distraction: Insights from children's limited attention. *Cognition*. 136, 156-165. DOI: 10.1016/j.cognition.2014.11.031
- Merkley, R.**, & Ansari, D. (2010). Using eye tracking to study numerical cognition: the case of the ratio effect. *Experimental Brain Research*. 206(4), 455-460. DOI: 10.1007/s00221-010-2419-8

REVIEW ARTICLES & COMMENTARIES

- Merkley, R.**, Scerif, G., & Ansari, D. (2017). What is the precise role of cognitive control in the development of a sense of number? (Commentary on Leibovich et al.) *Behavioral and Brain Sciences*
- Merkley, R.**, Matejko, A.A., & Ansari, D. (2017). Strong causal claims require strong evidence: A commentary on Wang et al. (2016). *Journal of Experimental Child Psychology*. DOI: 10.1016/j.jecp.2016.07.008
- Merkley, R.**, Matejko, A.A., & Wilkey, E.D. (2016). Exploring the origins and development of the visual number form area: A functionally specialized and domain-specific

region for the processing of number symbols? *Journal of Neuroscience*. 36, (17), 4659-4661. DOI: [10.1523/JNEUROSCI.0710-16.2016](https://doi.org/10.1523/JNEUROSCI.0710-16.2016)

Merkley, R., & Ansari, D. (2016). Why numerical symbols count in the development of mathematical skills: evidence from brain and behavior. *Current Opinion in Behavioral Sciences*. 10, 14-20. DOI: [10.1016/j.cobeha.2016.04.006](https://doi.org/10.1016/j.cobeha.2016.04.006)

CHAPTERS IN EDITED BOOKS

Merkley, R., Matusz, P.J. & Scerif, G. (2018). The control of selective attention and emerging mathematical cognition: Beyond unidirectional influences. In: Henik, A. & Fias, W. (eds). *Heterogeneity of Function in Numerical Cognition*, Elsevier.

MISCELLANEOUS SCHOLARLY PUBLICATIONS

Merkley, R. (2019). Inequality is today's greatest challenge to fostering learning. ([BOLD blog post](#))

Merkley, R. (2018). Differing perspectives but a common goal: Insights from conversations and collaborations with early math educators and researchers. ([BOLD blog post](#))

Merkley, R. & Ansari, D. (2018). Foundations for learning: Guided play for Early Years maths education. *Impact (Journal of the Chartered College of Teaching, UK)*

Turoman, N., Merkley, R., Scerif, G. & Matusz, P.J. (2017). How do kids and grown-ups get distracted in everyday situations? *Frontiers in Young Minds*. (Publication written for and reviewed by children) DOI: [10.3389/frym.2017.00008](https://doi.org/10.3389/frym.2017.00008)

Merkley, R., & Ansari, D. (2017). Numerical symbols count for mathematical success. *Perspectives on Language and Literacy*. ([Publication of the International Dyslexia Association](#))

Papers Presented

TO LEARNED SOCIETIES

2019 Merkley, R., McDonald, J.A., Collimore, L.M., Mickle, J., Keating, L., & Ansari, D. Understanding Educator Experiences Implementing Screeners to Assess Students' Early Math Skills: A Research-Practice Collaboration. *Mathematical Cognition and Learning Society*. Ottawa, Canada.

2016 Merkley, R., & Scerif, G. Developmental differences in the role of ordinality in the formation of abstract symbolic representations. *Canadian Society for Brain, Behaviour, and Cognitive Science Annual Meeting*. Ottawa, Canada

2015 Merkley, R., & Scerif, G. The development of inhibitory control and non-symbolic numerical processing in early childhood. *British Psychological Society Developmental and Social Sections Meeting*. Manchester, UK

TO OTHER ACADEMIC BODIES

- 2020 Cognitive Foundations of Early Years Math Development: Insights from Research-Practice Partnerships. *Centre for Educational Neuroscience Research Seminars, University College London - Birkbeck University of London - UCL Institute of Education*. London, UK - Presented remotely due to COVID-19. [Recording](#)
- 2016 Beyond number sense: Domain-general and specific contributions to early childhood numeracy. *Centre for Educational Neuroscience Research Seminars, University College London - Birkbeck University of London - UCL Institute of Education*. London, UK

COMMUNITY TALKS

- 2020 Building Blocks for Learning: Cognitive Development and STEM Education. *Curiosity on Stage - Canada Science and Technology Museum*. Ottawa, Ontario.
- 2017 The importance of early math skills and early assessment. *Halton Catholic District School Board Kindergarten Teacher and ECE In-service Training Day*. Oakville, Ontario.
- Early identification and intervention for learning difficulties: Collaborative efforts between researchers and educators. *Learning Disabilities Association of Ontario - London Region AGM*. London, Ontario.
- Math at home. *Earl Beatty Public School's Parent Council*. Toronto, Ontario.

POSTER PRESENTATIONS

- 2019 McDonald, J.A., **Merkley, R.**, Ansari, D., Collimore, L.M., & Mickle, J.. Understanding Educator Experiences Implementing Screeners to Assess Students' Early Math Skills: A Research-Practice Collaboration. *American Educational Research Association*. Toronto, Canada.
- 2018 Sokolowski, H.M., **Merkley, R.**, Bray Kingissepp, S.S., Vaikuntharajan, P., & Ansari, D. Learning verbal number words relates to how children attend to numerical quantity. *International Mind, Brain, and Education Society Conference*. Los Angeles, USA.
- 2017 **Merkley, R.**, Bugden, S., Scerif, G. & Ansari, D. What does it mean to have a concept of symbolic number: Developmental differences in cardinal and ordinal processing of Arabic numerals. *Improving Mathematical Cognition and Learning: Formal and Informal Instructional Influences & Interventions*. Nashville, USA
- 2016 Matusz, P. J. **Merkley, R.**, & Scerif, G. Taking attention back to school: Multisensory contexts reveal effects of experience on attention allocation. *International Mind, Brain, and Education Society Conference*. Toronto, Canada
- 2015 **Merkley, R.**, Shimi, A., & Scerif, G. The role of magnitude and ordinal information in the formation of novel symbolic numerical representations. *Flux Congress*. Leiden, Netherlands
- 2014 **Merkley, R.**, & Scerif, G. Does congruency between discrete and continuous properties of non-symbolic number influence children's formations of symbolic representations? *International Mind, Brain, and Education Society Conference*. Fort Worth, USA

Merkley, R., & Scerif, G. Perceptual information influences the formation of numerical representations: Evidence from an artificial learning paradigm. *EARLI SIG22: Neuroscience and Education Meeting*. Göttingen, Germany

2013 Merkley, R., & Scerif, G. Why do preschoolers' attention and numeracy relate? Implications from cognitive training. *British Psychological Society Developmental and Cognitive Sections Meeting*. Reading, UK

Funding

INTERNATIONAL PROJECT FUNDING

2019-2021 "Understanding Barriers and Potential of Early Childhood Education in Low-Income South Africa: Leveraging Children's Executive Functions", British Academy. £298,896.57 | Role: Collaborator (PI: Gaia Scerif, University of Oxford)

2018-2021 "Improving early number word learning: Examining the role of input.", NIE Education Research Funding Programme. \$150,000 SGD | Role: Collaborator (PI: Pierina Cheung, National Institute of Education, Singapore)

2016-2019 "Cognitive and Educational Foundations of Preschool Mathematics", Nuffield Foundation. £241,444 | Role: Collaborator (PI: Gaia Scerif, University of Oxford)

INTERNAL RESEARCH FUNDING

2020 Scholarship of Teaching and Learning Grant, Teaching and Learning Services. \$2500
2019 Carleton University Research Impact Endeavour (CURIE) fund, MacOdrum Library. \$750

Service to the Profession

CONFERENCE ORGANIZATION

Co-organizer of the 2019 Meeting of the [Mathematical Cognition and Learning Society](#)

JOURNAL REVIEWING

Cognition | Neuropsychologia | Developmental Science | Child Development | Journal of Experimental Child Psychology | ZDM Mathematics Education | Journal of Cognitive Neuroscience | PLoS ONE | Developmental Psychology | Research in Developmental Disabilities | Review of Educational Research | Bilingualism: Language and Cognition | British Journal of Educational Psychology | British Journal of Developmental Psychology | Frontiers in Psychology | Enfance en difficulté | Journal of Learning Disabilities | Journal of Numerical Cognition | Quarterly Journal of Experimental Psychology

GRANT REVIEWING

Nuffield Foundation | National Science Centre Poland | The Netherlands Organisation for Scientific Research

Academic Responsibilities

GRADUATE COURSES

Winter 2019 CGSC 5901W(cross-listed): Special Topics - Developmental Cognitive Neuroscience

UNDERGRADUATE COURSES

2019-2020 CGSC 3908A and B: Honours Seminar in Cognitive Science
2019-2020 FYSM 1607B: Cognitive Science: Thinking and Knowing
Winter 2019 CGSC 4900A: Special Topics - Developmental Cognitive Neuroscience
2018-2019 FYSM 1607B: Cognitive Science: Thinking and Knowing | Nominated as a '2018 Favourite Faculty' by The Department of Housing and Residence Life
Fall 2018 CGSC 2001A: Introduction to Cognitive Science

Administrative Responsibilities & Committee Assignments

DEPARTMENTAL

2019-2020 Faculty Board Representative
2018-2019 Undergraduate Committee Member

UNIVERSITY

2020- Equity and Inclusive Communities (EIC) Advisory Group

Other - Podcasts

2020 Guest on [Psychology in the Classroom](#) Podcast
2019- Co-host on voicED's [On the Right Track](#) Podcast
2018 Guest on voicED's [Do The Math](#) Podcast