

Stephanie Bugden, Ph.D.

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Education and Training

Postdoctoral Fellow, *March 2015 – Present*
Duke University (Mar 2015-Aug 2015) &
The University of Pennsylvania
Supervisor: Dr. Elizabeth M. Brannon

The University of Western Ontario, *December, 2014*
Ph.D., Psychology
Supervisor: Dr. Daniel Ansari
Thesis Title: Characterizing persistent developmental dyscalculia:
A cognitive neuroscience approach

The University of Western Ontario, *August, 2010*
M.Ed., Special Education and Educational Psychology
Supervisor: Dr. Daniel Ansari

The University of Western Ontario, *April, 2008*
B.A., Honors in Psychology, Developmental & Educational, Minor in French

Publications

Google Scholar Citations (as of September 10, 2018): 353, *h*-index: 5 (*i10*-index: 5)
† reviews, chapters, commentaries

†Dresler, T., **Bugden, S.**, Gouet, C., Lallier, M., Oliveira, D., Pinheiro-Chagas, P., Pires, A., Want, Y., Zugarramudi, C., & Weissheimer, J. (2018). A translational framework of educational neuroscience in learning disorders. *Frontiers in Integrative Neuroscience*, 12:25, doi: 10.3389/fnint.2018.00025.

Lyons, I.M., **Bugden, S.**, Zhang, S., De Jesus, S., & Ansari, D. (2018). Symbolic number skills predict growth in nonsymbolic number skills in kindergarteners. *Developmental Psychology*, 5(3), 440-457.

†**Bugden, S.**, DeWind, N., & Brannon, E. M. (2016). Using cognitive training to unravel the mechanistic link between the approximate number system and symbolic math skills, *Current Opinions in Behavioral Sciences*, 10, 73-80. doi: 10.1016/j.cobeha.2016.05.002.

Bugden, S., & Ansari, D. (2016). Probing the nature of deficits in the 'Approximate Number System' in children with persistent Developmental Dyscalculia. *Developmental Science*, 19(5), 817-33. doi: 10.1111/desc.12324.

†**Bugden, S.** & Ansari, D. (2014). Why your brain can't do $2 + 2$: A case of developmental dyscalculia. *Frontiers for Young Minds*, 2(8). doi: 10.3389/frym.2014.00008

†**Bugden, S.**, & Ansari, D. (2014). How can cognitive developmental neuroscience constrain our understanding of developmental dyscalculia? In Chinn, S. (Ed.) *The Routledge International Handbook of Dyscalculia and Mathematical Learning Difficulties*. Routledge

Nosworthy, N., **Bugden, S.**, Archibald, L., Evans, B., & Ansari, D. (2013). A two-minute paper and pencil test of symbolic and nonsymbolic numerical magnitude processing explains variability in primary school children's arithmetic competence. *Plos One*, 8(7), e67918.

Bugden, S., Price, G., McLean, A., & Ansari, D. (2012). The role of the left intraparietal sulcus in the relationship between symbolic number processing and children's arithmetic competence, *Developmental Cognitive Neuroscience*, 118(1), 32-44.

Bugden, S., & Ansari, D. (2011). Individual differences in children's mathematical competence are related to intentional but not automatic processing of Arabic numerals. *Cognition*, 118, 32-44.

Manuscripts under review and in preparation

Bugden, S., Woldorff, M., & Brannon E.M. (under second review). Shared and distinct neural circuitry for nonsymbolic and symbolic double-digit addition.

Bugden, S., Nosworthy, N., Archibald, L., & Ansari, D. (under second review). A two minute test of symbolic and non-symbolic numerical magnitude process can accurately predict children with and without persistent developmental dyscalculia.

Bugden, S., & Brannon, E. M. (in prep). Approximate arithmetic training does not improve symbolic mathematics in third and fourth grade children.

Bugden, S., Lyons I. M., & Ansari, D. (in prep). Are ordinality deficits a marker for persistent Developmental Dyscalculia?

Teaching Experience

Guest Lecturer,

Atypical Mathematical Development, University of Pennsylvania

January, 2018

Intuitive Number Sense, University of Pennsylvania

November, 2016

The Mathematical Brain, University of Western Ontario

January, 2015

Teaching Assistant, University of Western Ontario

Sept 2013 – April 2014

Undergraduate Mathematical Cognition Course

Lab Coordinator, University of Western Ontario

April 2012 – Aug 2013

Undergraduate Research Methods and Statistical Sciences Course

Lab Instructor, University of Western Ontario

Sept 2010 – April 2012

Undergraduate Research Methods and Statistical Sciences Course

Academic Service

- Nanosymposium Chair**, “Cognitive Development and Numerical Cognition”
Society for Neuroscience, Washington, D.C., U.S. Nov 14, 2017
- Successful Careers in Psychological Science & Council for Women in Penn Psychology, **Steering committee chair*** Aug 2017-present
- Successful Careers in Psychological Science & Council for Women in Penn Psychology, **Steering committee member*** Sept 2016-May 2017
- Symposium Discussant**, “Reconciling domain-specific and domain-general influences on numerical cognition: Implications for education.” *International Mind Brain and Education Society, Toronto, Canada.* Sept, 2016
- International Mind Brain and Education Society **Student representative on the Board of Directors*** May 2014-May 2015
- Developmental Psychology Brownbag coordinator**,
Psychology department, University of Western Ontario Sept 2013-May 2014

Research Grants and Awards

- 1K99HD098329-01, Submitted June 10* Pending IRG Review
Title: How learning number words changes children’s brains
Stephanie Bugden (PI)
- Dr. Benjamin Goldberg Research Award* June 2013
Developmental Disabilities Division, University of Western Ontario
Amount: \$2 525
- Ontario Graduate Scholarship, External Government Grant,* 2013 - 2014
Amount: \$15 000
- Marilyn (Pack) McClelland Award in Psychology* Feb 2012
The University of Western Ontario
Amount: \$550
- Ontario Graduate Scholarship, External Government Grant* 2012 - 2013
Amount: \$15 000
- Ontario Graduate Scholarship, External Government Grant* 2011 - 2012
Amount: \$15 000
- Recipient of Reginald K. Groome Memorial Scholarship, Scouts Canada* 2006 – 2007
Amount: \$1000

Workshops Attended

- The 4th Latin American School for Education, Cognitive & Neural Sciences* Mar, 2014
Punta del Este, Uruguay
- One of fifty international applicants to receive a fully funded scholarship to attend a conference focusing on applying cognitive and neural science research to educational practice.

Mortimer D. Sackler, M.D. Summer Institute
Developmental Psychobiology, NY, New York

July 22- 26, 2013

Competitive scholarship to attend an internationally renowned training program to learn and develop collaborative relationships with distinguished researchers in the field of developmental, affective and cognitive neuroscience.

Invited Talks

Bugden, S., Woldorff, M., Brannon, E.M. (Nov 15, 2017). The distinct and shared neural substrates associated with approximate and exact addition. *Invited nanosymposium speaker and chair at the Society for Neuroscience, Washington, D.C., U.S.*

Bugden, S. (Feb 16, 2016). Characterizing persistent Developmental Dyscalculia: A cognitive neuroscience approach. *Invited talk for the Research in spatial cognition series in the Psychology department, Temple University, Philadelphia, PA, U.S.*

Zheng, S., De Jesus, S*., Anastaskakos, R., Robinson-Petrazzini, R., Ansari, D., Lyons, I.M., & **Bugden, S***. (April, 2016). Differentiated effects of children's demographics, previous school, and early interventions on their foundational numeracy skills. *Invited roundtable presenter at the American Educational Research Association, Washington, D.C. *indicate presenting speakers*

Bugden, S. & Ansari, D. (Nov, 2014). The neural correlates of numerical magnitude processing in children with Developmental Dyscalculia. *Invited symposium presenter at the International Mind Brain and Education Society, Fort Worth, Texas, U.S.*

Bugden, S., Price, G., & Ansari, D. (2011). The left intraparietal sulcus mediates the relationship between symbolic number processing and children's arithmetic competence. *Invited symposium presenter at the biennial meeting of Society of Research in Child Development, Montreal, QC, Canada.*

Scientific Outreach

Bugden, S. (Oct, 2014). Assessing the building blocks of early math skills. *Invited talk for all the kindergarten teachers in the Toronto District School Board, Toronto, Ontario, Canada*

Bugden, S. (April 4, 2013). The importance of early numeracy skills: Evidence from typically developing and atypically developing children. *Invited talk for the Student Librarians Association for Child and Youth Services, The University of Western Ontario, London, Ontario, Canada*

Conference Presentations

Bugden, S., & Brannon, EM. (Sept, 2018). Approximate arithmetic training does not improve symbolic mathematics performance in third and fourth grade children. *Poster presented at the International Mind Brain and Education Society, Los Angeles, CA., U.S.*

Lyons, I.M., Hutchison, J., **Bugden, S.**, Goffin, C., & Ansari, D. (2018). Out of Order – Kindergarteners reliably mis-classify ordered sequences of non-adjacent numbers, *Symposium talk at the Math Cognition and Learning Conference, Oxford, UK.*

Merkley, R., **Bugden, S.**, Scerif, G., & Ansari, D. (May, 2017). What does it mean to have a concept of symbolic number? Developmental differences in cardinal and ordinal processing of Arabic numerals. *Poster presented at the Math Cognition and Learning Conference, Nashville, TN., U.S.*

Lyons, I.M., De Jesus, S., Zheng, S., **Bugden, S.**, & Ansari, D. (March, 2016). Assessing Numeracy in the Classroom. *Poster presented at the Latin American School for Education, Cognitive and Neural Sciences.*

Bugden, S., Ansari, D. (Sept 17, 2016). The neural basis of symbolic, non-symbolic and mixed comparison in children with persistent developmental dyscalculia. *Poster at the Biennial Meeting of the International Mind Brain and Education Society, Toronto, Ontario, Canada, recipient of the best poster award*

Bugden, S. & Ansari, D. (May 19, 2014). Probing the nature of deficits in the 'Approximate Number System' in children with persistent Developmental Dyscalculia. *Received a merit award funded by NIH to cover expenses to present a poster at the Math Cognition and Learning Conference, Washington D.C., U.S.*

Bugden, S. & Ansari, D. (May 3, 2014). Probing the nature of deficits in the 'Approximate Number System' in children with persistent Developmental Dyscalculia. *Poster at the annual meeting of the Banff annual seminar in cognitive science (BASICS), Banff, Alberta, Canada.*

Bugden, S. & Ansari, D. (June, 2014). Probing the nature of deficits in the 'Approximate Number System' in children with persistent Developmental Dyscalculia. *Poster at the biennial meeting of the EARLI Sig 22: Education and Neuroscience, Gottingen, Germany.*

Bugden, S. (May 9, 2013). The effect of subitizing in mapping symbolic and nonsymbolic number representations in 4-6-year-old children. *Talk given at the Numerical Cognition Workshop, The University of Waterloo, Waterloo, Canada.*

Bugden, S., Archibald, L., & Ansari, D. (April 18, 2013). The effect of symbolic and non symbolic priming on magnitude processing in children with developmental dyscalculia. *Poster at the biennial meeting of Society of Research in Child Development, Seattle, Washington, U.S.*

Bugden, S., Nosworthy, N., Archibald, L., & Ansari D. (May, 2012). A longitudinal investigation of the stability of cognitive profiles in children with developmental dyscalculia. *Poster at the biennial meeting of the EARLI Sig 22: Education and Neuroscience, London, England.*

Nosworthy, N., **Bugden, S.**, Archibald, L., & Ansari, D. (May, 2012). The relationship between symbolic and non-symbolic numerical magnitude processing and arithmetic achievement in primary school: Evidence from a paper and pencil test. *Poster at the annual meeting of the Canadian Society for the Study of Education, Waterloo, ON, Canada*

Nosworthy, N., **Bugden, S.**, Archibald, L., & Ansari, D. (February, 2012). The relationship between symbolic and non-symbolic numerical magnitude processing and arithmetic achievement in primary school: Evidence from a paper and pencil test. *Poster at the annual meeting of the Lake Ontario Visionary Establishment, Niagara Falls, ON, Canada.*

Bugden, S., Price, G., McLean, A., & Ansari, D. (June, 2011). Parietal brain activation during number processing predicts children's arithmetic achievement. *Poster at the annual meeting of the Organization on Human Brain Mapping, Quebec, QC, Canada*

Bugden, S., & Ansari, D. (2009). Individual differences in children's math competence are related to intentional but not automatic processing of Arabic numerals. *Talk given at the Cognitive Development Laboratory Research Retreat, Department of Psychology, University of Western Ontario.*

Bugden, S., & Ansari, D. (2008). Basic numerical processing and mathematical competence in six to eight-year-old children. *Poster at The University of Western Ontario, Psychology undergraduate thesis presentation.*

Supervision and Mentorships

Undergraduate Student Research Supervision:

Jessica George (undergraduate thesis research project, University of Pennsylvania)

Jennifer Nazario (undergraduate thesis research project, University of Pennsylvania)

Dominique Martinez (Penn Undergraduate Research Mentoring Program, University of Pennsylvania)

Deena Elul (Penn Undergraduate Research Mentoring Program, University of Pennsylvania)

Ashley Sayles (undergraduate independent study project, University of Pennsylvania)

Riann Winget (undergraduate thesis research project. B.A. completed 2017, University of Pennsylvania)

I'mani Sellers (undergraduate independent study project. B.S. completed 2017, University of Pennsylvania)

Taylor Annett (undergraduate thesis research project, B.A. completed 2014 University of Western Ontario)

Jenna Horwitz (undergraduate thesis research project, B.A. completed 2014, University of Western Ontario)

Dominik Raabe (Visiting Scholar from Germany completing an independent neuroimaging research project, 2014)

Chelsea DeGuzman (undergraduate thesis research project, B.S. completed 2013, University of Western Ontario)

Adam Dharsee (undergraduate thesis research project in neuroimaging, B.A. completed 2013, University of Western Ontario)

Meghan Reid (undergraduate thesis research project, B.A. completed 2010, University of Western Ontario)