Eric D. Wilkey, PhD

Curriculum Vitae

Brain and Mind Institute
Western University

London, Ontario
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EDUCATION

Postdoc Western University, London, ON, Canada, 2018- present
Brain and Mind Institute, Numerical Cognition Lab
Advisor: Dr. Daniel Ansari

Ph.D. Vanderbilt University, Nashville TN, 2018
Neuroscience
Primary Advisor: Dr. Gavin R Price
Thesis Committee: Dr. Laurie Cutting, Dr. Frank Tong, Dr. Blythe Corbett
Dissertation: *Attention to Number: A neurocognitive foundation for mathematical competence*

M. Ed. Harvard University, Cambridge, MA, 2011
Mind, Brain and Education
Advisor: Dr. Jenny Thomson
Master's Project: Creative Cognition

B.A. Belmont University, Nashville, TN, 2007
Philosophy, minors in Classical Greek and Studio Art
Honors Scholar, Magna Cum Laude

RESEARCH EXPERIENCE

PhD Research (2013- present):
Vanderbilt University

- Task-based fMRI in adults at 7 Tesla
- Resting-state and task-based fMRI of adults and children at 3 Tesla
- Eye-tracking of adults and children
- Large-scale, longitudinal, school-based neurocognitive and academic assessments
- Anatomical MRI, typically developing children (Voxel-based morphometry and Surface-based analyses)
- Management of multiple lab projects and rotating group of 8-15 undergraduate RA's

Research Analyst (2011-2013):
Vanderbilt University

- Large-scale meta-analysis of predictors of school success
- City-wide Kindergarten reading intervention assessment

Master's Research (2010-2011)
Harvard University

- Transcranial Direct-Current Stimulation (tDCS) during phonics training
- Literature Review that produced a book chapter on Creative Cognition

PUBLICATIONS | ORCiD | Google Scholar

Wilkey, E. D., & Ansari, D. (in prep). Challenging the link between perception of number and numerical abilities. Annals of the New York Academy of Sciences. The Year in Cognitive Neuroscience Special Issue.

Wilkey, E. D., & Price, G. R. (in prep). Multivariate patterns of shared and distinct representations of symbolic and nonsymbolic number across tasks at 7T.

Conrad, B. N., **Wilkey, E. D.**, & Price, G. R. (in prep). Reorganization of the fronto-parietal network during symbolic and nonsymbolic number processing.

Pollack, C., **Wilkey, E. D.**, Price, G. R. (submitted) Predictors of middle school students' growth in symbolic number comparison performance.

Yeo, D. J**., Wilkey, E.D.,** Price, G. R. (submitted). Malleability of mapping between Arabic numerals and approximate quantities: Factors underlying individual differences and the relation to math.

Wilkey, E.D., Pollack, C., Price, G. R. (in press). Dyscalculia and typical math achievement are associated with individual differences in number specific executive function. *Child Development*. https://doi.org/10.1111/cdev.13194

Wilkey, E. D., & Price, G. R. (in press). Attention to number: The convergence of numerical magnitude processing, attention, and mathematics in the inferior frontal gyrus. *Human Brain Mapping*, 1–16. https://doi.org/10.1002/hbm.24422

Wilkey, E. D., Cutting, L. E., & Price, G. R. (2018). Neuroanatomical correlates of performance in a state-wide test of math achievement. *Developmental Science*, 21(2), e12545. http://doi.org/10.1111/desc.12545

Price, G. R. & **Wilkey, E. D.** (2018). Developmental Dyscalculia. In The SAGE encyclopedia of intellectual and developmental disorders. E. B. Braaten (Ed.). (Vol. 1, pp 379-383). Thousand Oaks, CA. Sage. http://dx.doi.org/10.4135/9781483392271.n125

Price, G. R., Yeo, D. J., **Wilkey, E. D.**, & Cutting, L. E. (2018). Prospective relations between resting-state connectivity of parietal subdivisions and arithmetic competence. *Developmental Cognitive Neuroscience*, 30, 280–290. http://doi.org/10.1016/j.dcn.2017.02.006

Wilkey, E. D., Barone, J. C., Mazzocco, M. M. M., Vogel, S. E., & Price, G. R. (2017). The effect of visual parameters on neural activation during nonsymbolic number comparison and its relation to math competency. *NeuroImage*, *159* (August), 430–442. http://doi.org/10.1016/j.neuroimage.2017.08.023

Price, G. R. & **Wilkey, E. D.** (2017). Cognitive mechanisms underlying the relation between nonsymbolic and symbolic magnitude processing and their relation to math. *Cognitive Development*, *44*(September), 139–149. http://doi.org/10.1016/j.cogdev.2017.09.003

Yeo, D. J., **Wilkey, E. D.**, & Price, G. R. (2017). The search for the number form area: A functional neuroimaging meta-analysis. *Neuroscience & Biobehavioral Reviews*, *78*(April), 145 160. http://doi.org/10.1016/j.neubiorev.2017.04.027

Price, G. R., **Wilkey, E. D.**, & Yeo, D. J. (2017). Eye-movement patterns during nonsymbolic and symbolic numerical magnitude comparison and their relation to math calculation skills. Acta Psychologica, 176(March), 47–57. http://doi.org/10.1016/j.actpsy.2017.03.012

*Merkley, R., **Wilkey, E. D.,** & Matejko, A. A. (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, 4659–4661. DOI: http://dx.doi.org/10.1523/JNEUROSCI.0710-16.2016

*** co-first-author publication**

Price, G. R., **Wilkey, E. D.**, Yeo, D. J., & Cutting, L. E. (2016). The relation between 1st grade greymatter volume and 2nd grade math competence. NeuroImage, 124, 232–237. doi:10.1016/j.neuroimage.2015.08.046

Tripney, J., Hombrados, T. J., Newman, M., Hovish, K., Brown, C., Steinka-Fry, K., & **Wilkey, E. D.** (2013). Technical and Vocational Education and Training Training (TVET) Interventions to Improve the Employability and Employment of Young People in Low- and Middle Income Countries : Systematic Review. *Campbell Systematic Reviews*, *9*. doi:10.4073/csr.2013.9

Cerruti, C., **Wilkey, E. D**., (2011) Verbal overshadowing and verbal facilitation in creative cognition. In L. DellaPietra (Ed.), *Perspectives on Creativity Vol. 2*. (pp. 178-187). Cambridge, UK: Cambridge Scholars Press. download.

International Conference Talks & Poster Presentations (** indicates conference talk)

Pollack, C., **Wilkey, E. D.**, Price, G. R. (accepted) What predicts middle school students' growth in symbolic number comparison performance? **Poster to be presented at** the biennial conference of the Society for Research in Child Development, Baltimore, Maryland, USA. March 2019.

Wilkey, E.D. & Price, G. R. (2018). The influence of attentional modulation on numerical magnitude processing mechanisms and their relation to math achievement. **Poster presented at** the biennial conference of the International Mind, Brain, and Education Society, Los Angeles, USA. September 2018.

Conrad, B. N., **Wilkey, E. D.**, & Price, G. R. (2018). Frontoparietal reorganization during symbolic and nonsymbolic number processing. **Poster presented at** the annual conference of the **Society for Neuroscience**, San Diego. November 2018.

Yeo, D. J**., Wilkey, E.D.,** Price, G. R. (2018). Malleability of mapping between Arabic numerals and approximate quantities: Factors underlying individual differences and the relation to math. **Poster presented at** the Mathematics Education Center's 3rd annual symposium: The symbol grounding problem, Loughborough, UK. June 2018.

Wilkey, E.D., Pollack, C., & Price, G.R. (2018). ANS acuity, mathematics achievement, and dyscalculia: Evidence for a domain-specific executive function relation. **Poster for** the Annual Meeting of the Cognitive Neuroscience Society, Boston, MA. March 2018.

Conrad, B. N., **Wilkey, E. D., & Price, G. R. (2018). Network Topology of Symbolic and Nonsymbolic Number Processing: A 7T fMRI Study. **Data blitz talk presented** at the Annual Meeting of the Cognitive Neuroscience Society, Boston, MA. March 2018.

Conrad, B. N., **Wilkey, E. D.**, & Price, G. R. (2018). Network Topology of Symbolic and Nonsymbolic Number Processing: A 7T fMRI Study. **Poster for** the Annual Meeting of the Cognitive Neuroscience Society, Boston, MA. March 2018.

****Wilkey, E.D.,** Barone, J. C., Mazzocco, M. M. M., Vogel, S. E., & Price, G. R. (2017). The Influence of Visual Cues on Nonsymbolic Number Comparison and Their Relation to Math Competency. **Nanosymposium talk presented at** the annual conference of the Society for Neuroscience, Washington, DC. November, 2017.

Yeo, D. J., **Wilkey, E. D.,** & Price, G. R. (2017). An ALE meta-analytical search for the putative number form area and its associated network. **Poster presented at** the annual conference of the Organization of Human Brain Mapping, Vancouver, Canada. June 2017.

Wilkey, E. D., & Price, G. R. (2017). Symbolic and Nonsymbolic Magnitude Processing, the Neural Distance Effect, and Math Achievement. **Poster presented at** the annual conference of the Organization of Human Brain Mapping, Vancouver, Canada. June 2017.

Wilkey, E.D., Barone, J. C., Mazzocco, M. M. M., Vogel, S. E., & Price, G. R. (2017). The Influence of Visual Cues on Nonsymbolic Number Comparison and Their Relation to Math Competency. **Poster presented at** the Annual Meeting of the Cognitive Neuroscience Society, San Francisco, CA March 2017.

Yeo, D. J., **Wilkey, E. D.**, & Price, G. R. (2017). The search for the putative number form area: A meta-analysis. **Poster presented at** the Annual Meeting of Cognitive Neuroscience Society, San Francisco, CA, March 2017.

Wilkey, E.D., Barone, J. C., Mazzocco, M. M., Vogel, S. E., Price, G. R. (2016). The Influence of Non-Numeric Visual Parameters on Performance and Neural Activation Patterns During Nonsymbolic Number Comparison. **Poster presented at** the biannual conference of the International Mind, Brain, and Education Society, Toronto, Canada. September 2016.

Yeo, D. J., **Wilkey, E.D.**, Price, G. R. (2016). The relation between numerical estimation flexibility and mathematical competence. **Poster presented at** the biannual conference of the International Mind, Brain, and Education Society, Toronto, Canada. September 2016.

Wilkey, E.D., Price, G. R. (2016). Eight-Year Growth in Math Skills and Its Relationship to Nonsymbolic and Symbolic Number Processing. **Poster presented at** the NIH and IES funded Math Cognition and Learning Conference special topic: The Role of Linguistic and Cultural Factors in Mathematical Cognitive Development, Ft. Worth , Texas. May 2016.

Yeo, D. J. , **Wilkey, E.D.,** Price, G. R. (2016). Eye movement patterns underlying symbolic and nonsymbolic numerical magnitude comparison. **Poster presented at** the NIH and IES funded Math Cognition and Learning Conference special topic: The Role of Linguistic and Cultural Factors in Mathematical Cognitive Development, Ft. Worth, Texas. May 2016.

Wilkey, E.D., Price, G. R. (2016). Task-Specific Processing of Arabic Digits in the Left Angular Gyrus. **Poster presented at** the annual conference of Cognitive Neuroscience Society, New York City, NY. April 2016.

Price, G. R, **Wilkey, E.D**., Yeo, D. J., Cutting, L. E. (2015). Resting-State Connectivity At 1st Grade Predicts Math Competence at 2nd Grade. **Poster presented at** the annual conference of the Society for Neuroscience, Chicago, IL. October 2015.

Wilkey, E.D., Price, G. R, Cutting, L. E. (2015). Neuroanatomical Correlates of Performance in State-Wide Test of Math Achievement. **Poster presented at** the annual conference of the Cognitive Neuroscience Society, San Francisco, CA March 2015.

* Price, G. R, **Wilkey, E.D**., Cutting, L. E. (2014). Neuroanatomical predictors of 3rd Grade Math Competence. **Poster presented at** the biannual conference of the International Mind, Brain and Education Society, Fort Worth, TX. November 2014.

* outstanding poster award; only one award for research posters at conference

Regional Conferences & Poster Presentations

Wilkey, E.D., Barone, J. C., Mazzocco, M. M., Vogel, S. E., Price, G. R. (2016). The Influence of Non-Numeric Visual Parameters on Performance and Neural Activation Patterns During Nonsymbolic Number Comparison. **Poster presented at** the Vanderbilt Brain Institute, Neuroscience Graduate Program Retreat, Nashville, TN. September 2016.

Wilkey, E.D., Price, G. R. (2016). Eight-Year Growth in Math Skills and Its Relationship to Nonsymbolic and Symbolic Number Processing. **Poster presented at** the 9th Annual Vanderbilt Kennedy Center Science Day, Nashville, TN. September 2016.

Yeo, D. J., **Wilkey, E.D.**, Price, G. R. (2016). The relation between numerical estimation flexibility and mathematical competence. **Poster presented at** the 9th Annual Vanderbilt Kennedy Center Science Day, Nashville, TN. September 2016.

Wilkey, E.D., Price, G. R, Cutting, L. E. (2015). Neuroanatomical Correlates of Performance in State-Wide Test of Math Achievement. **Poster presented at** the Vanderbilt Brain Institute, Neuroscience Graduate Program Retreat, Nashville, TN. September 2015.

Wilkey, E.D., Price, G. R. (2014). Musical Training & Mathematical Competence: *Behavioral Relationships and Neurocognitive Foundations.* **Poster presented at** Music & the Mind in Music City event, Nashville, TN, June 2014.

PRESENTATIONS

Invited Talks

Title: Open Science for Mathematical Cognition and Learning Research
Date: **scheduled for** June 16th, 2019
Event: Knowledge dissemination of BrainsCAN sponsored workshop
Location: London, ON

Title: Open Science
Date: November 13th, 2018
Event: Knowledge dissemination of BrainsCAN sponsored workshop
Location: London, ON

Title: *Learning and the Brain: Where are we now* **(keynote address)**
Date: July 20, 2016
Conference: Making Math Matter: Integrating Math Skills in Grades PK – 8; Teacher Training
Location: Memphis, TN

Title: *The Mathematical Brain*
Date: July 19, 2016
Conference: Making Math Matter: Integrating Math Skills in Grades PK – 8; Teacher Training
Location: Memphis, TN

Title: *The Mathematical Brain*
Date: March 1, 2016
Event: Brain Awareness Month; talk open to the general public
Location: Nashville, TN

Title: *Neuroanatomical Correlates of Math Competence*
Date: February 18th, 2016
Event: Departmental talk for Vanderbilt Cognition & Cognitive Neuroscience Department
Location: Nashville, TN

Title: *Neuroanatomical Correlates of Math Competence*
Date: January 15th, 2016
Event: Departmental talk for Vanderbilt Psychology & Human Development Department
Location: Nashville, TN

GRANTS & AWARDS

- *Hardy Culver Wilcoxon Award*, presented by the Peabody College Department of Psychology & Human Development (Vanderbilt University) to the graduate student with the most distinguished doctoral dissertation in any area of Psychological Inquiry, 2017-2018.

- Research-Achievement Fellowship from Vanderbilt Department of Psychology and Human Development (2017). Award provides stipend for one semester to pursue research aims that build on a previous first-author publication.

- Fellow at Kavli Summer Institute in Cognitive Neuroscience, UC Santa Barbara, 2016. Fellowship for tuition, room, and board.

- Stipend awarded from NIH to present at NIH and IES funded Math Cognition and Learning Conference special topic: The Role of Linguistic and Cultural Factors in Mathematical Cognitive Development, Ft. Worth, Texas. May 2016.

- Peabody Dean's Fellowship (2015 – 2018, Vanderbilt University).

- Peabody Graduate Honors Scholarship (2013 – 2018, Vanderbilt University)

- IMBES outstanding poster award at International Mind, Brain and Education Society, Fort Worth, TX. November 2014.

- Stacy Awalt Essay Award for best Research Paper at Belmont University Philosophy Department (2005).

- Stacy Awalt Essay Award for best Creative/Original work at Belmont University Philosophy Department (2004).

TEACHING

Vanderbilt University

Guest Lecturer (2 Classes): Spring 2018
Undergraduate seminar: Educational Neuroscience

- Neuroanatomy
- Neuropharmacology and "Smart Drugs"

Guest Lecturer (4 Classes): Fall 2017
Master's and undergraduate seminar: Educational Neuroscience

- Neuropharmacology and "Smart Drugs"
- Behavioral Testing for Educational Neuroscience

Guest Lecturer (4 Classes): Spring 2017
Master's and undergraduate seminars: Educational Neuroscience

- Neuropharmacology and "Smart Drugs"
- Behavioral Testing for Educational Neuroscience

Guest Lecturer (2 classes): Fall 2016
Undergraduate seminar: Educational Neuroscience

- Neuropharmacology and "Smart Drugs"
- Behavioral Testing for Educational Neuroscience

Guest Lecturer (3 classes): Fall 2015
Undergraduate seminar: Numerical Cognition

- Lectures on Intro to neuroimaging & numerical cognition and guided paper discussions.

Teaching assistant: Spring 2015
Undergraduate course: Introduction to Neuroscience

Teaching assistant: Fall 2014
Undergraduate course: Introduction to Statistical Analysis

- Independently taught 2 sections of 20 students one day a week; lecture and statistics lab

MENTORING

Vanderbilt University

Gabrielle Freitag (2015-2018), honors undergraduate in Psychology
Current position: research assistant at NIH

Ellen Andrews (2015-2017), honors undergraduate in Neuroscience
Current position: research assistant at Emory

Mary Liz Kim (2014-2017), honors undergraduate in Neuroscience
Current position: enrolled in U Southern California med school

Jordan Barone (2014-2016), honors undergraduate in Neuroscience
Current position: enrolled in Md/PhD at U Chicago

SERVICE

Journal Article Reviews
Neuroimage
Cognitive Science
Journal of Cognitive Neuroscience

Thesis Committees
2018 Undergraduate Honors Thesis Committee; Olivia Lasala, Vanderbilt University

2018 Undergraduate Honors Thesis Committee; Jack Lyden, Vanderbilt University
2017 Undergraduate Honors Thesis Committee; Rachel Telles, Vanderbilt University

College & Department:
2016 Neuroscience Student Organization- elected to Curriculum Committee, Vanderbilt University
2015 Neuroscience Student Organization- elected to Curriculum Committee, Vanderbilt University

Conference Committees:
2018 International Mind, Brain, and Education Conference Poster Committee (Co-Chair)

ADVANCED COURSES ATTENDED

2018	Open Science Workshop	Cork, Ireland
2017	Connectivity Course: Structural and Functional	Boston, USA
2016	Summer Institute in Cognitive Neuroscience	UC Santa Barbara, USA
2015	Freesurfer Training Course	Boston, USA

SOFTWARE AND CODING SKILLS

- Proficient at handling large-scale datasets and complex analyses in: **R, SPSS, MATLAB, and STATA.**
- Proficient at neuroimaging analysis in: **Brainvoyager (Neuro-elf, batch processing, Python scripting), Freesurfer, MATLAB, and SPM.**
- Basic skills in: **Python, BASH, and C++, Markdown, R Markdown, Git**
- Database creation and management using REDCAP & Filemaker.