

# Eric D. Wilkey, PhD

## Curriculum Vitae

Brain and Mind Institute  
Western University

London, Ontario  
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Canada

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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*. doi: 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. (submitted) 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 3<sup>rd</sup> 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 3<sup>rd</sup> 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 9<sup>th</sup> 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 9<sup>th</sup> 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 16<sup>th</sup>, 2019

**Event:** Knowledge dissemination of BrainsCAN sponsored workshop

**Location:** London, ON

**Title:** Open Science

**Date:** November 13<sup>th</sup>, 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 18<sup>th</sup>, 2016

**Event:** Departmental talk for Vanderbilt Cognition & Cognitive Neuroscience Department

**Location:** Nashville, TN

**Title:** *Neuroanatomical Correlates of Math Competence*

**Date:** January 15<sup>th</sup>, 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.