

## HILARY BARTH, PH.D.

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### ACADEMIC APPOINTMENTS

<i>Associate Professor</i> , Department of Psychology, Wesleyan University	2012-
<i>Assistant Professor</i> , Department of Psychology, Wesleyan University	2005-2012
<i>Research Associate</i> , Department of Psychology, Harvard University	2004-2005
<i>Visiting Assistant Professor</i> , Department of Psychology, Wellesley College	2004-2005
<i>Postdoctoral Fellow</i> , Department of Psychology, Harvard University	2002-2004

### EDUCATION

Postdoctoral training, Laboratory for Developmental Studies Department of Psychology, Harvard University	2002-2005
Ph.D. in Cognitive Neuroscience Department of Brain & Cognitive Sciences, MIT	1996-2002
A.B. <i>magna cum laude</i> in Psychology, Neural/Behavioral Sciences concentration Department of Psychology, Bryn Mawr College	1992-1996

### EXTERNAL FUNDING

- NSF EHR-CORE award DRL-1561214 (\$1,101,456 total) 2016-2019  
*Collaborative proposal: Foundations of Quantitative Thought: Number, Space, Time, and Probability* (PI Barth, Co-PI Patalano)
- National Living Laboratory Partner Stipend (\$3000 direct) 2015-2016  
(in partnership with the Connecticut Science Center)
- National Living Laboratory Educational Assistance (\$1000 direct) 2015-2016
- National Living Laboratory Stipend (\$3000 direct) 2014-2015  
(in partnership with the Connecticut Science Center)
- National Living Laboratory Stipend (\$300 direct) 2013-2014  
(in partnership with the Connecticut Science Center)
- Mattel Philanthropic Programs Play Research Grant (\$18,500 direct) 2011-2012  
*Understanding the power of play* (with Co-PIs Shusterman & Slusser)
- NSF CAREER Award DRL-0950252 (\$761,005 total) 2010-2016  
*Magnitude biases in mathematical cognition, learning, & development*
- Mellon Faculty Career Enhancement Summer Stipend Grant (\$7,500 direct) 2006
- Postdoctoral Fellowship, Nat'l Academy of Ed./Spencer Foundation (\$50,000 direct) 2003-2004
- Graduate Fellowship, Claire Booth Luce Program (\$25,000 direct) 1998-1999

## PUBLICATIONS – Peer-reviewed empirical articles

- McCrink, K., Shafto, P., & **Barth, H.** (in press). The relationship between non-symbolic multiplication and division in childhood. *Quarterly Journal of Experimental Psychology*.
- **Barth, H.**, Slusser, E., Kanjlia, S., Garcia, J., Taggart, J., & Chase, E. (in press). How feedback improves children's numerical estimation. *Psychonomic Bulletin & Review*.
- Schug, M.G., Shusterman, A., **Barth, H.**, & Patalano, A.L. (2016). Early group bias in the Faroe Islands: Cross-cultural variation in children's group-based reasoning. *Quarterly Journal of Experimental Psychology* 69, 1741-1751.
- Patalano, A., Saltiel, J., Machlin, L., & **Barth, H.** (2015). The role of numeracy and approximate number system acuity in predicting value and probability distortion. *Psychonomic Bulletin & Review* 22, 1820-1829.
- **Barth, H.**, Lesser, E., Taggart, J., & Slusser, E.B. (2015). Spatial estimation: A non-Bayesian alternative. *Developmental Science* 18, 853-862.
- **Barth, H.**, Bhandari, K., Garcia, J., MacDonald, K., & Chase, E. (2014). Preschoolers trust novel members of accurate speakers' groups and judge them favorably. *Quarterly Journal of Experimental Psychology* 67, 872-883.
- MacDonald, K., Schug, M.G., Chase, E., & **Barth, H.** (2013). My people, right or wrong? Minimal group membership disrupts preschoolers' selective trust. *Cognitive Development* 28, 247-259.
- Slusser, E.B., Santiago, R.T., & **Barth, H.** (2013). Developmental change in numerical estimation. *Journal of Experimental Psychology: General* 142, 193-208.
- Schug, M.G., Shusterman, A., **Barth, H.**, & Patalano, A.L. (2013). Minimal group membership influences children's responses to novel experiences with group members. *Developmental Science* 16, 47-55.
- Sullivan, J., & **Barth, H.** (2012). Active (not passive) spatial imagery primes temporal judgments. *Quarterly Journal of Experimental Psychology*, 65, 1101-1109.
- Sullivan, J., Juhasz, B., Slattery, T., & **Barth, H.** (2011). Adults' number-line estimation strategies: evidence from eye movements. *Psychonomic Bulletin and Review*, 18, 557-563.
- Anderson, B.L., O'Vari, J., & **Barth, H.** (2011). Non-Bayesian contour synthesis. *Current Biology*, 21, 492-496.
- **Barth, H.** & Paladino, A.M. (2011). The development of numerical estimation: Evidence against a representational shift. *Developmental Science*, 14, 125-135.
- Bhandari, K., & **Barth, H.** (2010). Show or tell: Testimony is sufficient to induce the curse of knowledge in three- and four-year-olds. *Quarterly Journal of Experimental Psychology*, 63, 209-215.
- **Barth, H.**, Starr, A.B., & Sullivan, J. (2009). Children's mappings of large number words to numerical magnitudes. *Cognitive Development*, 24, 248-264.
- **Barth, H.**, Baron, A., Spelke, E.S., & Carey, S. (2009). Children's multiplicative transformations of discrete and continuous quantities. *Journal of Experimental Child Psychology*, 103, 441-454
- **Barth, H.** (2008). Judgments of discrete and continuous quantity: An illusory Stroop effect. *Cognition*, 109, 251-266.
- **Barth, H.**, Beckmann, L., & Spelke, E.S. (2008). Nonsymbolic, approximate arithmetic in children: Evidence for abstract addition prior to instruction. *Developmental Psychology*, 44, 1466-1477.
- Cappelletti, M., **Barth, H.**, Fregni, F., Spelke, E.S., & Pascual-Leone, A. (2007). rTMS over the intraparietal sulcus disrupts numerosity processing. *Experimental Brain Research*, 179, 631-642.
- **Barth, H.**, La Mont, K., Lipton, J., Dehaene, S., Kanwisher, N., & Spelke, E.S. (2006). Non-symbolic arithmetic in adults and young children. *Cognition*, 98, 199-222.

- **Barth, H.**, La Mont, K., Lipton, J., & Spelke, E.S. (2005). Abstract number and arithmetic in preschool children. *Proceedings of the National Academy of Sciences*, *102*, 14116-14121.
- **Barth, H.**, Kanwisher, N., & Spelke, E.S. (2003). The construction of large number representations in adults. *Cognition*, *86*, 201-221.
- Anderson, B.L., & **Barth, H.C.** (1999). Motion-based mechanisms of illusory contour formation. *Neuron*, *24*, 433-441.

### **PUBLICATIONS – Book chapters and commentaries**

(Students in italics; postdoctoral fellows underlined)

- **Barth, H.**, Slusser, E.B., Cohen, D., & *Paladino, A.M.* (2011). A sense of proportion: Commentary on Opfer, Siegler, & Young. *Developmental Science*, *14*, 1205-1206.
- **Barth, H.** (2008). Do mental magnitudes form part of the foundation for natural number concepts? Don't count them out yet. Commentary on Rips, Asmuth, & Bloomfield. *Behavioral & Brain Sciences*, *31*, 644-645.
- Mordkoff, J. T., & **Barth, H.** (2001). Using pre-pulse inhibition to study attentional capture: a warning about pre-pulse correlations. In C. Folk and B. Gibson (Eds.), *Attraction, Distraction, and Action: Multiple Perspectives on Attentional Capture* (pp.177-190). Amsterdam: Elsevier.

### **CONFERENCE PRESENTATIONS, 2007 - present**

- Barth, H.** (submitted). Do biases in quantity judgments reveal optimal cognitive processing? Meeting of the Psychonomic Society.
- Reichelson, S., **Barth, H.**, Bass, I., Zax, A., & Patalano, A. (submitted). Does the arbitrary grouping of physical options influence children's and adults' choices? Meeting of the Psychonomic Society.
- Barth, H.** (2016). Research toys as educational tools. Presentation/participation for workshop "Live from the Living Lab: Tools to maximize parent engagement," organized by the National Living Laboratory Initiative, Association for Children's Museums InterActivity Conference, 2016.
- Reichelson, S., **Barth, H.**, Bass, I., Taggart, J., Zax, A., *Lesser, E.*, & Patalano, A. (2016). Does the arbitrary grouping of physical options influence children's and adults' choices? Meeting of the Eastern Psychological Association.
- Barth, H.**, Lesser, E., Taggart, J., Slusser, E.B., Bass, I., Reichelson, S., & Schwab, A. (2015). Intuitive proportional reasoning and development in spatial memory. Conference abstract, Meeting of the Cognitive Development Society.
- Barth, H.**, Lesser, E., Taggart, J., Bass, I., & Slusser, E.B. (2015). A non-Bayesian explanation of adults' and children's biased spatial estimates. Conference abstract, Meeting of the Society for Research in Child Development (SRCD).
- Roberts, J., Taggart, J., Bass, I., & **Barth, H.** (2015). Minimal group membership and children's ideas of fairness and equality. Conference abstract, Meeting of the Society for Research in Child Development (SRCD).
- Barth, H.**, Taggart, J., Bass, I., & George, E. (2015). Links between lab-based measures of numerical competence and TEMA scores. National Council of Teachers of Mathematics (NCTM) Research Conference.
- Barth, H.**, Lesser, E., Taggart, J., Bass, I., & Slusser, E.B. (2015). Non-Bayesian explanations of spatial bias. Conference abstract, International Convention of Psychological Science 2015 (ICPS).

- Roberts, J., Taggart, J., & **Barth, H.** (2014). Influence of minimal group membership on children's ideas of equality. Conference abstract, Annual Meeting of the Eastern Psychological Association.
- Barth, H.** (2014). Novel explanations of developmental change in numerical estimation. Discussion session, National Council of Teachers of Mathematics (NCTM) Research Conference.
- McCrink, K., **Barth, H.** (2013). Non-symbolic multiplication, division and inversion in young children. Conference abstract, Meeting of the Society for Research in Child Development (SRCD).
- Slusser, E., Chase, E., Berkowitz, T., George, E., Swee, M., Cho, D., **Barth, H.**, & Shusterman, A. (2013). The power of play: Promoting preschoolers' social and numerical development through independent play with toys. Conference abstract, Meeting of the Society for Research in Child Development (SRCD).
- Barth, H.**, George, E., & Taggart, J. (2013). An investigation of numerical estimation, numerical acuity, and math ability. Conference abstract, Meeting of the Society for Research in Child Development (SRCD).
- Patalano, A., **Barth, H.**, Saltiel, J., Kaplan, L., & Machlin, L. (2012). Individual probability weighting patterns over time and across probability formats. Conference abstract, Meeting of the Society for Judgment and Decision Making.
- Barth, H.** (2011). Proportional reasoning in number-line estimation. Symposium: *New perspectives on developmental change in numerical estimation*, Meeting of the Cognitive Development Society.
- Barth, H.**, Kanjlia, S., Slusser, E., Garcia, J., & Chase, E. (2011). Proportional reasoning and children's number-line estimation: The role of feedback. Conference abstract, Meeting of the Cognitive Development Society.
- Slusser, E., Borden, A., Seiden, M., **Barth, H.**, & Shusterman, A. (2011). Drawing comparisons across children's performance on numerical and proportion estimation tasks. Conference abstract, Meeting of the Cognitive Development Society.
- Barth, H.**, Garcia, J., Slusser, E., MacDonald, K., Acheampong, A., Kanjlia, S., & Santiago, R. (2011). Proportional reasoning shapes children's number-line estimates. Conference abstract, Meeting of the Society for Research in Child Development (SRCD).
- Slusser, E., MacDonald, K., & **Barth, H.** (2011). Converging evidence for a proportion-judgment account of numerical estimation: evaluating performance on two types of number-line tasks. Conference abstract, Meeting of the Society for Research in Child Development (SRCD).
- MacDonald, K., Schug, M.G., & **Barth, H.** (2011). My people, right or wrong? Minimal group membership disrupts children's selective trust in testimony. Conference abstract, Meeting of the Society for Research in Child Development (SRCD).
- Schug, M.G., Shusterman, A., **Barth, H.**, & Patalano, A. (2011). Early group bias and cultural context: minimal group membership influences information processing in two societies. Conference abstract, Meeting of the Society for Research in Child Development (SRCD).
- Slusser, E., Garcia, J., MacDonald, K., Acheampong, A., Kanjlia, S., & Santiago, R., & **Barth, H.** (2011). Number-line estimation tasks reflect reasoning about proportionality and numerical magnitude. Conference abstract, Meeting of the Jean Piaget Society.
- Slusser, E., Garcia, J., MacDonald, K., Acheampong, A., Kanjlia, S., & Santiago, R., & **Barth, H.** (2011). Evidence that proportion-judgment models explicate children's performance on number-line estimation tasks. Conference abstract, Meeting of the Eastern Psychological Association.
- Barth, H.**, Paladino, A., & Sullivan, J. (2009). Developmental continuity in numerical estimation: A proportion-judgment account. Conference abstract, Annual Meeting of the Psychonomic Society.
- Barth, H.**, Paladino, A., & Sullivan, J. (2009). Developmental continuity in numerical estimation. Conference abstract, Meeting of the Cognitive Development Society.

- Schug, M.G., Patalano, A., **Barth, H.**, Shusterman, A., Herrig, E., & MacDonald, K. (2009). Group bias, statistical reasoning, and social judgments. Conference abstract, Meeting of the Cognitive Development Society.
- Schug, M.G., Patalano, A., **Barth, H.**, & Shusterman, A. (2009). Group bias, prosocial behavior, and social judgments in early childhood. Conference abstract, Meeting of the Human Behavior and Evolution Society (HBES).
- Bhandari, K., & **Barth, H.** (2009). Acquiring knowledge from others: preschoolers' use of testimony. Conference abstract, Meeting of the Society for Research in Child Development (SRCD).
- Sullivan, J., MacDonald, K., Paladino, A., & **Barth, H.** (2009). Children's mappings of number words to large numerosities. Conference abstract, Meeting of the Society for Research in Child Development (SRCD).
- Barth, H.** (2007). Judging discrete and continuous quantity: In large sets, number counts. Annual Meeting of the Psychonomic Society.
- Barth, H.**, Ballinger, A., Carrasco, A., Jacobson, R., & Tsai, J. (2007). Children's assessments of volume and number in 3D object arrays. Meeting of the Society for Research in Child Development (SRCD).
- Ballinger, A., & **Barth, H.** (2007). Counting, estimation, and approximate nonverbal arithmetic in young children. Annual Meeting of the Society for Research in Child Development (SRCD).

### POSTDOCTORAL FELLOWS

- Dr. Mariah Schug, 2008 - 2010 (co-advisor with Dr. Andrea Patalano & Dr. Anna Shusterman)  
 Dr. Emily Slusser, 2010 - 2012 (co-advisor with Dr. Anna Shusterman)

### M.A. THESIS SUPERVISION

- Keera Bhandari '08, B.A./M.A. student: M.A. in Psychology '09  
 M.A. Thesis: *Acquiring knowledge from others: Preschoolers' use of testimony*
- Sheri Reichelson '16, B.A./M.A. student: M.A. in Psychology expected '17  
 M.A. Thesis: *TBA*

### UNDERGRADUATE HONORS THESIS SUPERVISION

- Ariel Ballinger '07, B.A. in Psychology and Neuroscience & Behavior  
 B.A. Thesis: *Counting, estimation, and nonsymbolic approximate addition in young children*
- Kyle MacDonald '10, B.A. in Psychology  
 B.A. Thesis: *Group bias in preschoolers' assessments of speaker reliability*
- Martine Seiden '11, B.A. in Psychology  
 B.A. Thesis: *The proportional reasoning abilities of preschool children*
- Shipra Kanjlia '12, B.A. in Psychology, Neuroscience & Behavior, and Biology  
 B.A. Thesis: *How feedback improves children's numerical estimation*
- Emilie George '13, B.A. in Neuroscience & Behavior  
 B.A. Thesis: *An investigation of numerical estimation, numerical acuity, and math ability*
- Jillian Roberts '15, B.A. in Psychology and Sociology  
 B.A. Thesis: *Investigating minimal group bias and equality preference in children's resource allocation tasks*

## **UNDERGRADUATE RESEARCH SUPERVISION**

Class of 2006: Nick DeWind

Class of 2007: Ariel Ballinger Starr, AnjaLi Carrasco, Sarah Elgart, Margaret Gullick, Lisa Sacerio, Nora Switchenko, Jessica Tsai, Allison Zoromski

Class of 2008: Keera Bhandari, Joseph Feldblum, Rachel Jacobson, Phoebe Jones, Jessica Sullivan, Nicole Gray

Class of 2009: Julie Neuspiel, Annie Paladino

Class of 2010: Elise Herrig, Kyle MacDonald, Jennifer Garcia

Class of 2011: Anima Acheampong, Luci Cassella, Martha Liskow, Martine Seiden

Class of 2012: Adele Borden, Deborah Cho, Kenneth Feder, Shipra Kanjlia, Hannah Monk, Eleanore Pankow, Rachel Santiago, Hao (Felix) Wang

Class of 2013: Isabel Bernstein, Emilie George, Laura Machlin

Class of 2014: Madeline Kidd, Portia Lundie, Jason Saltiel, Amy Toig, Rachel Warner, Adam Watson

Class of 2015: Ellen Lesser, Zoe Feingold, Jillian Roberts, Sonia Zavala

Class of 2016: Aime Arroyo-Ramirez, Ziyue (Zora) Li, Pinzhen (Louise) Lu, Elissa Palmer, Sheri Reichelson, Anna Schwab, Sarah Seo

Class of 2017: Sarah Corner, Jamie Hom, Ilana Ladis, Maxine Lai, Lizzie Shackney

Class of 2018: Kerry Brew, Jordan Feingold-Link, Meghana Kandlur, Praise Owoyemi, Joanna Paul, Ray Peters

## **COURSES TAUGHT AT WESLEYAN**

### **Lecture courses**

Developmental Psychology	PSYC 230
Sensation & Perception	PSYC/NS&B 222

### **Methods courses**

Research Methods in Developmental Psychology	PSYC 207
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### **Seminar courses**

Topics in Cognitive Neuroscience	PSYC/NS&B 335
Numbers in Minds	CHUM/PSYC 336
Mathematical Cognition & Children's Learning	PSYC 337 (service learning)
Origins of Knowledge	PSYC/NS&B 348
Advanced Research Seminar	PSYC 520 ( <i>graduate</i> )

### **Laboratory courses**

Advanced Research in Cognitive Development	PSYC 384 (service learning in SP16)
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## **DEPARTMENT, PROGRAM, AND UNIVERSITY SERVICE**

Chair, Developmental Psychology Faculty Search Committee, 2015-2016

Cognitive Visiting Faculty Search Committee, Spring 2014

Proposal Evaluation Committee - Wesleyan University Summer Experience Grant, Spring 2014

University IRB, Fall 2013 alternate, Spring 2014 full member

Psychology Department Ethics Committee, Spring 2014 (chair), Spring 2012, Fall 2010

Psychology Department mentor for junior faculty, Spring 2014-  
Psychology Department Statistics & Methods committee, Spring 2014  
Library Faculty Advisory Committee, Spring 2012-Fall 2014  
Psychology Department Space Utilization Committee, 2012-present; 2005-2006  
Coordinator, Postdoctoral Program Pilot Report, Spring 2011  
Psychology Department Postdoctoral Committee, 2008-2012  
Psychology Department Cognitive Science committee, 2008-present  
McNair Program research mentor, 2007-2008; 2010-2012  
NS&B Program Search Committee, Fall 2010  
Co-Organizer, Cognitive Science Brown Bag Lunch series, 2007-present  
NSM lunch speaker, Spring 2008  
McNair Program speaker, Spring 2008  
Coordinator, Graduate Program in Psychology, 2007-2008  
Contributor, Science & Art Lecture Series, 2007  
Hughes Program speaker, Summer 2007  
Psychology Department Participant Pool committee, 2005-2008  
Psychology Department Developmental search committee, 2006-2007  
Psychology Department Colloquium Series co-coordinator, 2005-2008  
Psychology Department Curriculum Committee, 2008  
Psychology Department Work Group for Postdoctoral Fellowship Program planning, 2007-2008

## **PROFESSIONAL ACTIVITIES & SERVICE**

### *Recent invited talks*

Current Work in Developmental Psychology seminar, Yale University (Jan 2016)  
“Is the Brain Bayesian?” Conference, NYU Center for Mind, Brain, & Consciousness (Dec 2015)  
Department of Psychology, Developmental colloquium, UMass Amherst (Nov 2015)  
Department of Psychology Developmental colloquium, Boston College (May 2014)

### *Current Advisory Board service*

Advisory Board member for NSF CAREER grant to Elizabeth Gunderson, Ph.D. (Temple U.)  
Advisory Board member for NSF CAREER grant to Nicole McNeil, Ph.D. (Notre Dame)  
Advisory Board member for NSF REAL grant to Rebekah Richert (UC Riverside), Ellen Wartella (Northwestern U.), & Sandra Calvert (Georgetown U.)

### *Current dissertation committee service*

Committee member for Michelle Hurst  
Boston College Department of Psychology  
Advisor: Sara Cordes  
Ph.D. expected December 2016, Title TBD

### *Grant, conference, & report reviewing*

Submission reviewer, Meeting of the Society for Research in Child Development  
Submission reviewer, Meeting of the Cognitive Science Society  
Report reviewer, National Academies Center for Education/Mathematical Sciences Education Board  
report on Early Childhood Mathematics  
Ad hoc reviewer, NSF Research on Education and Learning (REAL)

Ad hoc reviewer, NSF Development and Learning Sciences (DRL)  
Panel reviewer & ad hoc reviewer, NSF Research & Evaluation on Education in Science and Engineering (REESE)  
Panel reviewer, NSF Research on Learning & Education (ROLE)  
Panel reviewer, NSF Human & Social Dynamics (HSD) Priority Area

*Ad-hoc journal reviewing*

Attention Perception & Psychophysics, Behavioral & Brain Sciences, Child Development, Cognition, Cognitive Development, Cognitive Psychology, Developmental Science, European Journal of Educational Psychology, Experimental Psychology, Journal of Experimental Child Psychology, Journal of Experimental Psychology: General, Journal of Vision, Learning and Individual Differences, Neuroimage, Psychological Science, Psychonomic Bulletin & Review, Quarterly Journal of Experimental Psychology

*Participation and/or membership in professional organizations*

OECD/CERI Learning Sciences and Brain Research initiative, American Psychological Society, Psychonomic Society (Associate Member), Society for Research in Child Development, Cognitive Development Society, Cognitive Science Society, Eastern Psychological Association, Jean Piaget Society