

**Sara Cordes, Ph.D.**

Boston College Department of Psychology and Neuroscience  
140 Commonwealth Avenue  
300 McGuinn Hall  
Chestnut Hill, MA 02467  
Office: 345 McGuinn Hall  
(617) 552-4112  
[cordess@bc.edu](mailto:cordess@bc.edu)  
[www.cordeslab.org](http://www.cordeslab.org)

**Positions Held**

2021 – Professor, Boston College Psychology and Neuroscience Department  
2016 – 2021 Associate Professor, Boston College Psychology and Neuroscience Department  
2009 – 2016 Assistant Professor, Boston College Psychology Department  
2005 – 2009 Research Associate, Duke University Psychology Department and Center for Cognitive Neuroscience

**Education**

2005 Ph.D., Cognitive Psychology  
Certificate in Cognitive Science  
*Rutgers University, New Brunswick, NJ*

2002 M.S., Psychology  
*Rutgers University, New Brunswick, NJ*

1999 B.A., Psychology and Mathematics Applied Science, cum laude  
*University of California, Los Angeles*

**Honors and Awards**

Fellow, Association for Psychological Science, 2019  
Society for Improvement of Psychological Science Mission Award for improving psychological science in the face of challenge, as contributor to the ManyBabies1 Collaboration, 2019  
Boston College Faculty Sabbatical, Spring 2018  
Boston College Faculty Fellowship, Spring 2014  
Fellow, Psychonomic Society, 2013  
National Science Foundation CAREER Award, 2011-2016  
Alfred P. Sloan Research Fellowship in Neuroscience, 2010-2012  
International Society for Infant Studies Travel Award, 2008  
Duke Center for Neuroeconomics Travel Award, 2007  
National Institutes of Health Postdoctoral NRSA Fellowship, 2006-2009  
Rutgers University Louis Bevier Dissertation Fellowship, 2004-2005  
Rutgers University Dean's Award for Outstanding Graduate Research, 2003  
National Science Foundation Graduate Fellowship Award, 2001-2004  
Rutgers University Center for Cognitive Science Traineeship Fellowship, 2000-2002  
University of California Regents Scholarship Award, 1994-1999

**Professional Activities**Editorial Activities:

Associate Editor, *Developmental Science* (2016-present)

Consulting Editor, *Journal of Experimental Psychology: General* (2016-present)

Editorial Review Board Member, *Frontiers in Comparative Psychology* (2014-present)

Reviewing:

National Science Foundation Review Panelist (2008; 2009; 2011; 2013; 2014; 2015; 2020)

National Science Foundation College of Reviewers (2014, 2015, 2016)

Chair, Number/Spatial Cognition/Relational Reasoning Panel, Cognitive Development Society (2017)

Reviewer: *Animal Cognition; Attention, Perception and Psychophysics; Behavioral and Brain Functions; Behavioral Processes; Brain Research; Canada Foundation for Innovation; Child Development; Cognition; Cognitive Development; Cognitive Psychology; Developmental Science; Developmental Psychology; European Journal of Child Development; Frontiers in Psychology; Frontiers in Integrative Neuroscience; Infancy; Infant Behavior and Development; International Conference on Infant Studies; Journal of Cognition and Development; Journal of Experimental Child Psychology; Journal of Experimental Psychology: General; Journal of Experimental Psychology: Human Perception and Performance; Journal of Experimental Psychology: Learning, Memory, and Cognition; Journal of Vision; Language Learning and Development; Learning and Behavior; National Science Foundation CAREER program; National Science Foundation SBE Postdoctoral Research Fellowship Program; PLoS One; Psychonomic Bulletin & Review; Psychological Science; Proceedings of the National Academy of Sciences; Society for Research in Child Development; Society for Philosophy and Psychology; Trends in Cognitive Science; TIMELY*

Memberships

Psychonomic Society Fellow

Association for Psychological Science Fellow

Cognitive Development Society

International Society for Infant Studies

Society for Research in Child Development

Mathematical Cognition and Learning Society

Other Professional Activities

Founding Member, Boston College Consortium for Translational Research on Learning and Memory (2020-present)

Contributor, Crespo, A. (2020) *Lia and Luís: Who has More?* Charlesbridge, MA, USA.

Organizer (with Beth Casey) of Boston College Distinguished Seminar Series on Mathematical Development, Collaboration between the College of Arts and Sciences and Lynch School of Education (2013-2016)

Member, Advisory Board for the Museum of Science NSF-ISE grant "*Creating Communities of Learners for Informal Cognitive Science Education*" (2011-2017)

Member, Raising a Reader MA Evaluation Brain Trust Advisory Board (2016-2017)

Supervisor of summer research internship for students from primarily undergraduate institutions and/or from under-represented groups to engage in developmental research at Boston College, (2012-present)

McNair Exploratory Program Faculty Mentor (2013, 2015, 2016, 2019-2020)

Research Sponsor, University of Bath Undergraduate Internship Program (2014-present)

**External Research Support**

**Previous:**

2010-2012	\$50,000	
Alfred P. Sloan Research Fellowship	PI: Sara Cordes	
8/15/2011-8/14/2017	\$490,573	
NSF: CAREER #1056726	PI: Sara Cordes	
<i>Understanding and Facilitating Numerical Discriminations in Infants</i>		
05/01/2016-04/30/2018	\$20,000	
National Endowment for the Arts	PI: Ellen Winner	Role: Co-PI
<i>To Support a Randomized, Controlled, Longitudinal Study of Cognitive Impacts of Ensemble Music Training in At Risk Children</i>		
09/01/2015-08/31/2018	\$300,046	
John Templeton Foundation #56348	PI: Sara Cordes	
<i>Cognitive Underpinnings and Consequences of Generosity</i>		
05/01/2018-09/30/2018	\$21,723	
American Psychological Association	PI: Sara Cordes	
<i>Summer Undergraduate Psychology Research Experience Grant</i>		
09/01/2015-08/31/2019	\$45,000	
Massachusetts Cultural Council	PIs: Sara Cordes, Ellen Winner, Adele Diamond	
<i>Effects of Intensive Ensemble Music Programs on Children's Cognitive and Affective Development</i>		
05/01/2019-09/30/2019	\$25,836	
American Psychological Association	PI: Joshua Hartshorne	Role: Co-PI
<i>Summer Undergraduate Psychology Research Experience Grant</i>		
07/01/2016-06/30/2021	\$177,496	
National Science Foundation #1561217	PIs: Sara Cordes, Hilary Barth, Andrea Patalano	
<i>Collaborative Proposal: Foundations of Estimation: Number, Space, Time, and Probability</i>		

**Current:**

08/01/2019-07/31/2022	\$479,009	
National Science Foundation #1920725	PIs: Sara Cordes, Nadia Chernyak	
<i>Collaborative Research: Social Influences of Math Learning</i>		
08/01/2019-07/31/2022	\$870,968	
National Science Foundation #1920732	PI: Sara Cordes	
<i>The Developmental Emergence and Consequences of Spatial and Math Gender Stereotypes</i>		
10/15/2020-10/14/2024	\$668,841	
National Science Foundation #1941002	PI: Sara Cordes	
<i>The Development of Number Concepts in Deaf and Hard of Hearing Children</i>		
04/15/2021-04/14/2024	\$330,331	
National Science Foundation #2051064	PI: Katherine McAuliffe	Role: Co-PI
<i>REU Site: Developing Social Minds</i>		
07/01/2022-06/30/2026	\$554,710	
National Science Foundation #2201962	PI: Sara Cordes (Boston College)	
<i>Collaborative Research: A Multi-Lab Investigation of the Conceptual Foundations of Early Number Development</i>		

\*\*See section on Mentoring (below) for funding awarded to my graduate and postdoctoral students.

**Boston College Internal Research Support**

Summer/Fall 2011	Boston College Research Expense Grant, \$2,000
Winter/Spring 2012	Boston College Research Expense Grant, \$2,000
Summer/Fall 2012	Boston College Research Expense Grant, \$2,000
Summer/Fall 2013	Boston College Research Expense Grant, \$2,000
Winter/Spring 2014	Boston College Research Expense Grant, \$2,000
Winter/Spring 2015	Boston College Research Expense Grant, \$2,000
Summer/Fall 2015	Boston College Research Expense Grant, \$2,000
Winter/Spring 2016	Boston College Research Expense Grant, \$2,000
Summer/Fall 2017	Boston College Research Expense Grant, \$2,000
2017-2018	Boston College Research Incentive Grant, \$15,000
Winter/Spring 2018	Boston College Research Expense Grant, \$2,000
Summer/Fall 2018	Boston College Research Expense Grant, \$2,000
Winter/Spring 2019	Boston College Research Expense Grant, \$2,000
Summer/Fall 2019	Boston College Research Expense Grant, \$2,000
Winter/Spring 2020	Boston College Research Expense Grant, \$2,000
2020-2021	BC Consortium for Translation Research on Learning and Memory, \$144,500 (Collaborator)

**Publications****NOTE:**

*Last authorship denotes senior authorship.*

*\* denotes undergraduate/post-bachelor advisee*

*# denotes grad student advisee*

*^ denotes post-doctoral student advisee*

- Cordes, S., Gelman, R., Gallistel, C. R., & Whalen, J. (2001).** Variability signatures distinguish verbal from nonverbal counting for both large and small numbers. *Psychonomic Bulletin & Review*, 8(4), 698-707.
- Gelman, R., & **Cordes, S.** (2001). Counting in animals and humans. In E. Dupoux (Ed.), *Language, Brain, and Cognitive Development: Essays in Honor of Jacques Mehler* (p. 279-303). Cambridge, MA: MIT Press.
- Cordes, S. & Gelman, R.** (2005). The young numerical mind: When does it count? In J. Campbell (Ed.), *Handbook of Mathematical Cognition*. London: Psychology Press, (pp. 127-142).
- Cordes, S.** (2006). Nonverbal rate computations in humans. *Dissertation Abstracts International: Section B: The Sciences and Engineering*, 66(11-B), pp. 6302
- Brannon, E. M., Lutz, D., & **Cordes, S.** (2006). The development of area discrimination and its implications for number representation in infancy. *Developmental Science*, 9(6), F59-F64.
- Gallistel, C. R., Gelman, R., & **Cordes, S.** (2006). The cultural and evolutionary history of the real numbers. In S. Levinson & P. Jaisson (Eds.), *Evolution and culture: A Fyssen Foundation symposium*. Cambridge, MA: MIT Press (pp. 247-274).
- Cordes, S., Gallistel, C. R., Gelman, R., & Latham, P.** (2007). Nonverbal arithmetic in humans: Light from noise. *Perception and Psychophysics*, 69(7), 1185-1203.
- Cordes, S., King, A. P., & Gallistel, C. R.** (2007). Time left in the mouse. *Behavioural Processes*, 74(2), 142-151.
- Cordes, S., Williams, C. L., & Meck, W. H.** (2007). Common representations of abstract quantities. *Current Directions in Psychological Science*, 16(3), 156-161.

- Cordes, S., & Brannon, E. M. (2008a).** The difficulties of representing continuous extent in infancy: Using number is just easier. *Child Development*, *79*(2), 476-489.
- Cordes, S. & Brannon, E. M. (2008b).** Quantitative competencies in infancy. *Developmental Science*, *11*(6), 803-808.
- Cordes, S., & Gallistel, C. R. (2008).** Interval timing in circadian clock mutants. *Brain Research*, *1227*, pp. 120-127.
- Cantlon, J. F., **Cordes, S.**, Libertus, M. E. & Brannon, E. M. (2009a). Comment on "Log or linear? Distinct intuitions of the number scale in western and Amazonian Indigene cultures". *Science*, *323*, 38b.
- Cantlon, J. F., **Cordes, S.**, Libertus, M. E., & Brannon, E. M. (2009b). Numerical abstraction: It ain't broke. *Behavioral and Brain Sciences*, *32* (3-4), 331-332.
- Cordes, S. & Brannon, E. M. (2009a).** Crossing the divide: Infants discriminate small from large numerosities. *Developmental Psychology*, *45*(6), 1583-1594.
- Cordes, S. & Brannon, E. M. (2009b).** The relative salience of discrete and continuous quantities in infants. *Developmental Science*, *12*(3), 453-463.
- Buhusi, C. V. & **Cordes, S.** (2011). Time and number: The privileged status of small values in the brain. *Frontiers in Integrative Neuroscience*, *5*(67), 1-3.
- Cordes, S. & Brannon, E. M. (2011).** Attending to one of many: When infants are surprisingly bad at discriminating an item's size. *Frontiers in Psychology*, *2*(65), 1-8, doi: 10.3389/fpsyg.2011.00065.
- #Pleil, K., **Cordes, S.**, Meck, W. H., & Williams, C. L. (2011). Sex differences in timing: Possible neuroendocrine mechanisms. *Frontiers in Integrative Neuroscience*, *5*(63), 1-15, doi: 10.3389/fnint.2011.00063.
- ^Anderson, U. S. & **Cordes, S.** (2013). 1<2 and 2<3: Nonlinguistic appreciations of numerical order. *Frontiers in Psychology*, *4*(5). doi: 10.3389/fpsyg.2013.00005
- Cordes, S. & Meck, W. H. (2013).** Ordinal abilities in the rat: An understanding of longer and shorter for supra-second, but not sub-second durations. *Journal of Experimental Psychology: General*, *143*(2), 710-720.
- #Young, L. N. & **Cordes, S.** (2013). Fewer things, lasting longer: The effects of emotional stimuli on quantity judgments. *Psychological Science*, *24*(6), 1057-1059.
- #Young, L. N., Winner, E., & **Cordes, S.** (2013). Heightened incidence of depressive symptoms in adolescents involved in the arts. *Psychology of Aesthetics, Creativity, and the Arts*, *7*(2), 197-202.
- Cordes, S.**, \*Goldstein, A., & \*Heller, E. (2014). Sets within sets: The influence of set membership on numerical estimates. *Journal of Experimental Psychology: Human Perception and Performance*, *40*(1), 94-105.
- #Hurst, M., \*Monahan, K. L., \*Heller, E., & **Cordes, S.** (2014). 1, 2, 3's and A, B, C's: A log-linear shift for unfamiliar sequences in children and adults. *Developmental Science*, *17*(6), 892-904.
- #Young, L. N., **Cordes, S.**, & Winner, E. (2014). Arts involvement predicts academic achievement only when the child has a musical instrument. *Educational Psychology: An International Journal of Experimental Educational Psychology*, *34*(7), 849-861.
- #Cantrell, L., Boyer, T., **Cordes, S.** & Smith, L. (2015). Signal clarity: An account of the variability in infant quantity discrimination tasks. *Developmental Science*, *18*(6), 877-893.
- #Posid, T. & **Cordes, S.** (2015a). The small-large divide: A case of incompatible numerical representations in infancy. In D. Geary, D. Berch, & K. Mann-Koepke (Eds.), *Evolutionary Origins and Early Development of Basic Number Processing*.
- #Posid, T. & **Cordes, S.** (2015b). Verbal counting moderates perceptual biases found in children's cardinality judgments. *Journal of Cognition and Development*, *16*(4), 621-637.
- #Posid, T., \*Fazio, A., & **Cordes, S.** (2015). Being sticker-rich: Numerical context influences children's sharing behavior. *PLOS ONE*, *10*(11).
- ^Cherynak, N., \*Sandham, B., Harris, P. L., & **Cordes, S.** (2016). Numerical cognition explains age-related changes in third-party fairness. *Developmental Psychology*, *52*(10), 1555.
- \*Goldstein, A., #Cole, T., **Cordes, S.** (2016). How parents read counting books and non-numerical books to their preverbal infants: An observational study. *Frontiers in Psychology*, *7*.

- #Hamamouche, K. & **Cordes, S.** (2016). Space, time, and number. In T.K. Shackelford & V.A. Weekes-Shackelford (Eds.), *Encyclopedia of Evolutionary Psychological Science*.
- #Hurst, M. & **Cordes, S.** (2016). Rational-number comparison across notation: Fractions, decimals, and whole numbers. *Journal of Experimental Psychology: Human Perception and Performance*, 42(2), 281.
- Eyler, R., **Cordes, S.**, Szymanski, B., & Fraenkel, L. (2017). Utilization of continuous “spinners” to communicate risk. *Medical Decision Making*.
- #Hamamouche, K., #Niemi, L. & **Cordes, S.** (2017). Quantifying a threat: Evidence of a numeric processing bias. *Acta Psychologica*, 177, 1-9. (\*\*equal contribution)
- #Hurst, M., ^Anderson, U. S., & **Cordes, S.** (2017). The acquisition of mappings among number words, written numerals, and quantities in preschoolers, *Journal of Cognition and Development*, 18(1), 41-62. doi: 10.1080/15248372.2016.1228653.
- #Hurst, M. & **Cordes, S.** (2017a). When being good at math isn't enough: How students' beliefs about the nature of mathematics impact decisions to pursue optional math education. In U. Xolocotzin (Ed.), *Understanding Emotions in Mathematical Thinking and Learning*. San Diego, CA: Elsevier.
- #Hurst, M. & **Cordes, S.** (2017b). Working memory strategies during rational number magnitude processing. *Journal of Educational Psychology*.
- \*Lewis, E., \*Zax, A. & **Cordes, S.** (2017). The impact of emotion on numerical estimation: A developmental perspective. *Quarterly Journal of Experimental Psychology*, 1-36.
- #Savelkouls, S. & **Cordes, S.** (2017). Numerical intuitions in infancy: Give credit where credit is due. *Behavioral and Brain Sciences*, 40.
- Barth, H., **Cordes, S.**, & Patalano, A.L. (2018). Suboptimality in perceptual decision making and beyond. *Brain and Behavioral Sciences*.
- Eyler, R. F., **Cordes, S.**, Szymanski, B. R., & Fraenkel, L. (2018). Use of feedback to improve mental number-line representations in primary care clinics. *BMC Medical Informatics and Decision Making*, 18(1), 40.
- #Hamamouche, K., \*Keefe, M., Jordan, K., & **Cordes, S.** (2018). Cognitive load affects numerical, but not temporal, judgments. *Frontiers in Psychology*, 9, 1783. doi: 10.3389/fpsyg.2018.01783
- Hogan, J., **Cordes, S.**, Holochwost, S., Ryu, E., Diamond, A., & Winner, E. (2018). Is more time in general music class associated with stronger extra-musical outcomes in kindergarten? *Early Childhood Research Quarterly*, 45, 238-248.
- #Hurst, M. & **Cordes, S.** (2018a). A systematic investigation of the link between rational number processing and algebra ability. *British Journal of Psychology*, 109(1), 99-117.
- #Hurst, M. & **Cordes, S.** (2018b). Attending to relations: Proportional reasoning in 3- to 6-year-old children. *Developmental Psychology*, 54(3), 428.
- #Hurst, M. & **Cordes, S.** (2018c). Children's understanding of fraction and decimal symbols and the notation-specific relation to pre-algebra ability. *Journal of Experimental Child Psychology*, 168, 32-48.
- #Posid, T. & **Cordes, S.** (2018). How high can you count? Probing the limits of young children's counting. *Developmental Psychology* 54(5), 875-889.
- ^Chernyak, N., Harris, P., & **Cordes, S.** (2019). Explaining early moral hypocrisy: Numerical cognition promotes equal sharing behavior in preschool-aged children. *Developmental Science*, 22(1), e12695.
- Cordes, S.** (2019). Bees know that zero is less than one. *Learning and Behavior*, 47(3), 187-188.
- \*Gordon, R., ^Chernyak, N., & **Cordes, S.** (2019). Get to the point: Preschoolers' spontaneous gesture use during a cardinality task. *Cognitive Development*, 52.
- #Hamamouche, K. & **Cordes, S.** (2019a). A divergence of sub- and supra-second timing abilities in childhood and its relation to academic achievement. *Journal of Experimental Child Psychology*, 178, 137-154.
- #Hamamouche, K. & **Cordes, S.** (2019b). Number, time, and space are not singularly represented: Evidence against a common magnitude system. *Psychonomic Bulletin and Review*, 26(3), 833-854.

- #Hurst, M. & **Cordes, S.** (2019). Talking about proportion: Fraction labels impact numerical interference in non-symbolic proportional reasoning. *Developmental Science*, 22(4), e12790.
- #Niemi, L., \*Woodring, M., Young, L., & **Cordes, S.** (2019). Partisan mathematical processing of political polling statistics: It's the expectations that count. *Cognition*, 186, 95-107.
- #Posid, T. & **Cordes, S.** (2019). The effect of multimodal information on children's numerical judgments. *Journal of Experimental Child Psychology*, 182, 166-186.
- Xing, C., Paul, J., Zax, A., **Cordes, S.**, Barth, H., & Patalano, A. L. (2019). Probability-range effects on probability distortion in a gambling task. *Acta Psychologica*, 197, 39-51.
- Zax, A., Williams, K., Patalano, A., Slusser, E., **Cordes, S.**, & Barth, H. (2019). What do biased estimates tell us about cognitive processing? Intuitive proportional reasoning in spatial judgments. *Journal of Cognition and Development*, 1-27.
- ^Chernyak, N., \*Turnbull, V., \*Gordon, R., Harris, P. & **Cordes, S.** (2020). Counting promotes proportional social evaluation in preschool-aged children. *Cognitive Development*, 56.
- #Hamamouche, K., ^Chernyak, N., & **Cordes, S.** (2020). Sharing scenarios facilitate division performance in preschoolers. *Cognitive Development*, 56.
- #Hamamouche, K. & **Cordes, S.** (2020). Learning about time: Knowledge of formal timing symbols is related to individual differences in temporal precision. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 46(1), 117.
- #Hurst, M., Massaro, M., & **Cordes, S.** (2020). Fraction magnitude: Mapping between symbolic and spatial representations of proportion. *Journal of Numerical Cognition*, 6(2), 204-230.
- The ManyBabies Consortium (2020). Quantifying sources of variability in infancy research using the infant-directed speech preference. *Advances in Methods and Practices in Psychological Science*.
- Patalano, A. L., Zax, A., Williams, K., Mathias, L., **Cordes, S.**, & Barth, H. (2020). Intuitive symbolic magnitude judgments and decision making under risk in adults. *Cognitive Psychology*.
- #Savelkouls, S., #Hurst, M., & **Cordes, S.** (2020). Preschoolers' number knowledge relates to spontaneous focusing on number for small, but not large, sets. *Developmental Psychology*, 56.
- #Savelkouls, S. & **Cordes, S.** (2020). The impact of set size on cumulative area judgments. *Acta Psychologica*, 210.
- ^Santos, S. & **Cordes, S.** (2021). Math abilities in deaf and hard of hearing children: The role of language in developing number concepts. *Psychological Review*.
- Gonzalez, G., Ahl, R.E., **Cordes, S.**, & McAuliffe, K. (2021). Children strategically conceal selfishness. *Child Development*.
- #Hurst, M. A., Boyer, T. W., & **Cordes, S.** (2021). Spontaneous and directed attention to number versus proportion. *Journal of Experimental Psychology: Learning, Memory, and Cognition*.
- #Hurst, M. A., \*Wong, A., \*Gordon, R., \*Alam, A., & **Cordes, S.** (2022). Children's gesture use provides insight into proportional reasoning strategies. *Journal of Experimental Child Psychology*.
- #Hildebrand, L.\*\*, #Posid, T.\*\*, Moss-Racusin, C., \*Hymes, L., & **Cordes, S.** (2022). Does my daughter like math? Gender-specific relations between parent and child math attitudes. *Developmental Science*. (\*\*equal contribution)
- Chernyak, N., Harris, P., & Cordes, S. (2022). A counting intervention promotes fair sharing in preschoolers. *Child Development*.
- Panavas, L., Worth, A., Crnovrsanin, T., Sathyamurthi, T., **Cordes, S.**, Borkin, M.A., & Dunne, C. (2022). Juvenile graphical perception: Comparison of graphical perception between children and adults. In *CHI'22: ACM Conference on Human Factors in Computing Systems, April 30-May 6, 2022, New Orleans, LA. ACM, New York, NY, USA*.
- \*Fish, L., #Hildebrand, L., Chernyak, N., & **Cordes, S.** (accepted in principle). Who's the winner? Children's math learning in competitive and collaborative scenarios. *Child Development*.

### Submitted Manuscripts

- #Hamamouche, K., & **Cordes, S.** (invited revision). *Symbolic and nonsymbolic processing of surface area in adulthood.*
- #Hamamouche, K., & **Cordes, S.** (invited revision). *How many seconds was that? Teaching children about time does not refine their ability to track durations*
- #Hamamouche, K., & **Cordes, S.** (invited revision). *Winning or losing: Consistency in children's proportional reasoning across motivational contexts.*
- #Hildebrand, L., & **Cordes, S.** (invited revision). *Children underperform following "math" but not "spatial" task framing.*
- ^Santos, S., Brownell, H., Coppola, M., Shusterman, A., & **Cordes, S.** (invited revision). *Evidence for the impact of language in the development of numerical concepts.*
- #Savelkouls, S. & **Cordes, S.** (invited revision). *Tracking the size of one item among many: Element area discrimination in infancy.*
- \*Wong, A., **Cordes, S.**, Harris, P. & Chernyak, N. (invited revision). *Being nice by choice: The effect of counterfactual reasoning on children's social evaluations.*

### **Manuscripts**

- Cordes, S.**, #Hildebrand, L., \*Sprague, L., Patalano, A., & Barth, H. (in prep). *Context effects across quantitative domains.*
- #Hildebrand, L., Barth, H., Patalano, A., & **Cordes, S.** (in prep). *Temporal and numerical context effects in childhood.*
- #Hildebrand, L. & **Cordes, S.** (in prep). *An integrated model of math and spatial skills, attitudes, gender, and STEM success.*

### **Conference Proceedings**

- #Young, L. N. & **Cordes, S.** (2012). Time and number under the influence of emotion. *Visual Cognition*, 20(9), 1048-1051.
- ^Chernyak, N., \*Sandham, B., Harris, P. L., & **Cordes, S.** (2016). Solving the knowledge-behavior gap: Numerical cognition explains age-related changes in fair sharing. *Proceedings of the Cognitive Science Society.*
- #Hamamouche, K., #Hurst, M., & **Cordes, S.** (2016). The effect of emotion and induced arousal on numerical processing. *Proceedings of the Cognitive Science Society.*
- #Hurst, M., \*Relander, C. & **Cordes, S.** (2016). Biases and benefits of number lines and pie charts in proportion representation. *Proceedings of the Cognitive Science Society.*
- #Hurst, M. & **Cordes, S.** (2018). Labeling fractions across notation, specific values, and education. *Proceedings of the Cognitive Science Society.*

### **Presentations:**

- Fish, L., Hildebrand, L., Hayes, S., & Cordes, S. (April 2022). Children's evaluations of helped students across academic domains. *Poster to be presented at the Biennial Meeting of the Cognitive Development Society, Madison, WI.*
- Hildebrand, L., Fish, L., & Cordes, S. (April 2022). Young children associated both competence and confidence with boys more than girls: Evidence for the early emergence of gender stereotypes about agency. *Poster to be presented at the Biennial Meeting of the Cognitive Development Society, Madison, WI.*
- Wong, A., Cordes, S., & Chernyak, N. (April 2022). The effect of counterfactual reasoning on children's moral evaluations. *Poster to be presented at the Biennial Meeting of the Cognitive Development Society, Madison, WI.*
- Hildebrand, L., Fish, L., & Cordes, S. (April, 2021). Children's gendered beliefs about confidence and competence. *Talk presented at the Virtual Society for Research in Child Development Biennial Meeting.*
- Hildebrand, L., & Cordes, S. (April, 2021). Comparing math and spatial attitudes and beliefs across development. *Talk presented at the Virtual Society for Research in Child Development Biennial Meeting.*



- Hurst, M.A., Wong, A., Gordon, R., Alam, A., & Cordes, S. (April, 2021). Children's gesture use provides insight into proportional reasoning strategies. *Talk presented at the Virtual Society for Research in Child Development Biennial Meeting.*
- Medina Ramirez, J. Cordes, S., & Chernyak, N. (April 2021). Social framing induces greater attention to numerical information in 4-7 year olds. *Poster presented at the Virtual Society for Research in Child Development Biennial Meeting.*
- Santos, S., Brownell, H., Coppola, M., Shusterman, A., & Cordes, S. (April, 2021). Language input matters for the development of numerical concepts: Evidence from deaf and hard-of-hearing children. *Talk presented at the Virtual Society for Research in Child Development Biennial Conference.*
- Fish, L., Hildebrand, L., & Cordes, S. (February, 2021). The role of gender in perceptions of confidence and competence. *Poster presented at the 2021 Society for Personality and Social Psychology (SPSP) Annual Convention, Virtual.*
- Hildebrand, L., Liebenow, H., & Cordes, S. (February, 2021). Different assumptions underlie male and female stereotypes. *Poster presented at the 2021 Society for Personality and Social Psychology (SPSP) Annual Convention, Virtual.*
- Hildebrand, L., Barth, H., Patalano, A. L., & Cordes, S. (November, 2020). Central tendency effects in children's and adults' magnitude estimates. *Poster presented at the 2020 Annual Meeting of the Psychonomic Society, Virtual Conference.*
- Hildebrand, L., & Cordes, S. (June, 2020). The impact of framing on math performance: The role of math attitudes and working memory. In L. Hildebrand (chair), *Consequences and Correlates of Math Anxiety Across Development. Symposium accepted at the Math Cognition and Learning Society (MCLS) Annual Meeting, Dublin, Ireland (conference cancelled due to COVID-19)*
- Hildebrand, L., & Cordes, S. (June, 2020). Are math and spatial gender stereotypes driven by beliefs about ability? *Poster accepted at the Math Cognition and Learning Society (MCLS) Annual Meeting, Dublin, Ireland. (conference cancelled due to COVID-19)*
- Coffey, T., Hildebrand, L., & Cordes, S. (June, 2020). The influence of time pressure on math performance. *Poster at the annual meeting of the Eastern Psychological Association, Boston, MA.*
- Kroll, E. & Cordes, S. (June, 2020). Impact of induced stress on susceptibility to framing effect by domain. *Poster at the annual meeting of the Eastern Psychological Association, Boston, MA.*
- Lim, C. J. R., Hildebrand, L., & Cordes, S. (June, 2020). Assumptions underlying children's gender stereotypes about math and spatial abilities differentially relate to domain-specific anxiety. *Poster at the annual meeting of the Eastern Psychological Association, Boston, MA.*
- Prince, M., Hildebrand, L., Chernyak, N., & Cordes, S. (June, 2020). The development of gender-based evaluations of past sharing behavior. *Poster at the annual meeting of the Eastern Psychological Association, Boston, MA.*
- Santos, S., Brownell, H., Coppola, M. Shusterman, A., & Cordes, S. (June, 2020). Language access and the development of numerical abilities in deaf and hard of hearing children. *Talk at the annual meeting of the Eastern Psychological Association, Boston, MA.*
- Wong, A., Hurst, M., Alam, A., Gordon, R., & Cordes, S. (June, 2020). Examining the effects of different types of gestures on children's proportional reasoning. *Poster at the annual meeting of the Eastern Psychological Association, Boston, MA.*
- Cordes, S. (March, 2020). Mathematical Cognition Symposium Discussant. [Symposium Cancelled]. *Talk at the annual meeting of the Eastern Psychological Association, Boston, MA.*
- Hamamouche, K., & Cordes, S. (October, 2019). How many seconds was that? The impact of teaching children about time on their ability to track durations. *Poster at the Cognitive Development Society Biennial Meeting, Louisville, KY.*
- Hildebrand, L., Barth, H., Patalano, A., & Cordes, S. (October, 2019). Context effects in children's numerical and temporal estimation. *Poster at the Cognitive Development Society Biennial Meeting, Louisville, KY.*
- Hildebrand, L., Lim, C., Cordes, S. (October, 2019). Framing matters: Relations between performance and math and spatial attitudes. *Poster at the Cognitive Development Society Biennial Meeting, Louisville, KY.*
- Prince, M., Hildebrand, L., Chernyak, N., & Cordes, S. (October, 2019). Gender as a cue to sharing preferences in 4-6 year-old children. *Poster at the Cognitive Development Society Biennial Meeting, Louisville, KY.*

- Sprague, L., Natt, G. & Cordes, S. (October, 2019). Effects of set size on cumulative area judgments in young children. *Poster at the Cognitive Development Society Biennial Meeting, Louisville, KY.*
- Hildebrand, L., & Cordes, S. (June, 2019). The Emergence of Gender Differences in Spatial and Math Attitudes Across Childhood. *Poster at the Annual Meeting of the Mathematical Cognition and Learning Society, Ottawa, CA.*
- Hamamouche, K. & Cordes, S. (June, 2019). Gain Scenarios Promote Attention to Number, Instead of Proportion, During Proportional Reasoning Tasks. *Poster at the Annual Meeting of the Mathematical Cognition and Learning Society, Ottawa, CA.*
- Santos, S., Brownell, H., Coppola, M., & Cordes, S. (June, 2019). Nonsymbolic Number Processing in Children with Hearing Loss. *Poster at the Annual Meeting of the Mathematical Cognition and Learning Society, Ottawa, CA.*
- Cordes, S. (April, 2019). Learning Number in a Social World. *Invited Talk at Connecticut College, New London, CT.*
- Hurst, M. Boyer, T., & Cordes, S. (April, 2019). Spontaneous and Directed Attention to Number and Proportion. Talk to be presented at the *Midwestern Psychological Society Annual Meeting, Chicago, IL.*
- Gonzalez, G., Ahl, R., Cordes, S., McAuliffe, K. (March, 2019). Fairness Façade: Will Children Strategically use a “Veil of Fairness”? *Poster to be presented at the Society for Research in Child Development, Baltimore, MD.*
- Savelkouls, S., & Cordes, S. (March, 2019). Infants’ Mapping Between Words and Number. *Poster to be presented at the Society for Research in Child Development, Baltimore, MD.*
- Xing, C., Zax, A., Paul, J., Cordes, S., Barth, H., & Patalano, A. (November, 2018). Re-evaluating the role of context in probability distortion. *Poster presented at the Annual Meeting of the Psychonomics Society, New Orleans, LA.*
- Hurst, M. & Cordes, S. (July, 2018). Labeling Common and Uncommon Fractions Across Education and Notation. *Poster presented at the Cognitive Science Society, Madison, WI.*
- Hamamouche, K., Keefe, M., Jordan, K., & Cordes, S. (July, 2018). Cognitive load impacts temporal and numerical judgments in distinct ways. *Poster presented at Cognitive Science Society Conference. Madison, WI.*
- Hamamouche, K. & Cordes, S. (May, 2018). Knowledge of formal temporal symbols predict age-related changes in temporal precision. *Talk presented at the Midwestern Cognitive Science Conference. Bloomington, IN.*
- Barth, H., Cordes, S., & Patalano, A. (May, 2018). What do relative quantity judgments tell us about the nature of cognitive processing? *Talk presented at 3<sup>rd</sup> International Meeting of the Psychonomic Society, Amsterdam, The Netherlands.*
- Xing, C., Zax, A., Paul, J., Cordes, S., Barth, H., & Patalano, A. (November, 2017). The role of context and numeracy in probability distortion. *Poster presented at 58<sup>th</sup> Annual Conference of the Psychonomic Society, Vancouver, BC.*
- Hamamouche, K. & Cordes, S. (October, 2017). The relation between symbolic and non-symbolic representations of time. *Talk presented at the First Conference of the Timing Research Forum. Strasbourg, France.*
- Cordes S. (October, 2017). Acquired whole number biases in nonsymbolic proportional reasoning. *Talk presented at University of Massachusetts, Amherst Number Workshop.*
- Hurst, M. & Cordes, S. (October, 2017). Aligning fractions and decimals with distinct contexts in 3<sup>rd</sup> to 5<sup>th</sup> grade children. *Poster presented at the Cognitive Development Society Biennial Meeting, Portland, OR.*
- Gordon, R., Chernyak, N. & Cordes, S. (October, 2017). Children’s spontaneous use of gesture in a numerical task. *Poster presented at the Cognitive Development Society Biennial Meeting, Portland, OR.*
- Chernyak, N., Gordon, R., Harris, P. & Cordes, S. (October, 2017). Improving inequality: Training children to count promotes equal sharing behavior. *Poster presented at the Cognitive Development Society Biennial Meeting, Portland, OR.*
- Hamamouche, K. & Cordes, S. (October, 2017). Sub- and supra-second timing follow unique developmental trajectories in childhood. *Poster presented at the Cognitive Development Society Biennial Meeting, Portland, OR.*
- Hurst, M., & Cordes, S. (May, 2017). The role of verbal fraction labels in children’s whole number bias. *Talk at the Association for Psychological Science Annual Meeting, Boston, MA.*
- Hamamouche, K., & Cordes, S. (May, 2017). The intersection of sharing behavior and approximate division in preschoolers. *Poster presentation at the Math Cognition Conference, Nashville, TN.*
- Hurst, M., & Cordes, S. (May, 2017). The role of verbal fraction labels in children’s whole number bias. *Poster presentation at the Math Cognition Conference, Nashville, TN.*
- Eyler, R., Cordes, S., & Fraenkel, L. (October, 2016). Utilization of continuous “spinners” to communicate risk. *Poster presentation at Society for Medical Decision Making Annual Meeting, Vancouver, BC.*
- Hamamouche, K., Taylor, J., & Cordes, S. (September 2016). Heightened attention improves children’s counting

- abilities. *Poster presentation at International Mind, Brain, and Education Society Conference. Toronto, Canada.*
- Chernyak, N., Sandham, B., Harris, P. L., & Cordes, S. (August, 2016). Numerical cognition explains age-related changes in sharing behavior. *Talk presented at the International Conference of Thinking. Providence, RI.*
- Hamamouche, K., Hurst, M., & Cordes, S. (August, 2016). The effect of induced arousal on numerical processing. *Talk presented at the Thirty-Eighth Annual Meeting of Cognitive Science Society. Philadelphia, PA.*
- Hurst, M., Relander, C. & Cordes, S. (August, 2016). Biases and benefits of number lines and pie charts in proportion representation. *Poster presented at Thirty-Eighth Annual Meeting of Cognitive Science Society. Philadelphia, PA.*
- Chernyak, N., Sandham, B., Harris, P. L., & Cordes, S. (August, 2016). Solving the knowledge-behavior gap: Numerical cognition explains age-related changes in sharing behavior. *Talk presented at the Thirty-Eighth Annual Meeting of Cognitive Science Society. Philadelphia, PA.*
- Chernyak, N., Sandham, B., Harris, P. L., & Cordes, S. (June, 2016). Mechanisms of sharing: Numerical cognition explains age-related changes in sharing behavior. *Talk presented at the Forty-Second Annual Meeting of the Society for Philosophy and Psychology. Austin, TX.*
- Hamamouche, K. & Cordes, S. (May, 2016). Diminished marginal utility and numerical processing in childhood. *Poster presented at the NIH Math Cognition Conference, Ft. Worth, TX.*
- Savelkouls, S., Lazaroff, E., & Cordes, S. (October, 2015). Infants' small number discriminations when controlling for continuous extent. *Poster presented at the Neuroeducation for Number Processing Symposium, Hannover, Germany.*
- Eyler, R., Cordes, S., & Fraenkel, L. (October, 2015). Use of feedback to improve symbolic-number mappings. *Poster presented at Society for Medical Decision Making Annual Meeting, St. Louis, MO.*
- Chernyak, N., Sandham, B., Harris, P. L., & Cordes, S. (October, 2015). Number-based sharing: Bridging numerical cognition and sharing behavior in early childhood. *Poster presented at Cognitive Development Society Biennial Meeting, Columbus, OH.*
- Hamamouche, K. & Cordes, S. (October, 2015). The relationship between diminished marginal utility and numeric processing in childhood. *Poster presented at Cognitive Development Society Biennial Meeting, Columbus, OH.*
- Hurst, M. & Cordes, S. (October, 2015). Reasoning with continuous and discrete proportions in 4 and 6 year old children. *Poster presented at Cognitive Development Society Biennial Meeting, Columbus, OH.*
- Posid, T., Hymes, L., Moss-Racusin, C., & Cordes, S. (October, 2015). The development and influence of math-gender stereotypes across the lifespan. *Poster presented at Cognitive Development Society Biennial Meeting, Columbus, OH.*
- Savelkouls, S. & Cordes, S. (October, 2015). Familiar labels help infants discriminate item size. *Poster presented at Cognitive Development Society Biennial Meeting, Columbus, OH.*
- Hurst, M. & Cordes, S. (May, 2015). The impact of working memory interference on fraction and decimal magnitude processing. *Poster presented at NIH Math Cognition Conference, St. Louis, MO.*
- Posid, T., Boyce, H. & Cordes, S. (March, 2015). Small/Large discrimination learning in toddlers. *Poster presented at the Biennial Meeting of the Society for Research in Child Development, Philadelphia, PA.*
- Cordes, S. (November, 2014). The role of counting in early numerical abilities. *Invited Talk: Yale University Developmental Psychology Colloquium, New Haven, CT.*
- Hurst, M. & Cordes, S. (November, 2014). The impact of working memory interference on fraction and decimal magnitude processing. *Poster presented at the International Mind, Brain, and Education Society Annual Meeting, Houston, TX.*
- Niemi, L., Goldstein, A., & Cordes, S. (May, 2014). Comparing quantities under the influence of emotion: Differing effects on temporal and numeric processing. *Poster presented at the Annual Convention of the Association for Psychological Science, Washington D.C.*
- Anderson, U.S. & Cordes, S. (May, 2014). When subtracting nonsymbolic quantities, a local visual focus reduces underestimation. *Poster presented at the Annual Convention of the Association for Psychological Science, Washington D.C.*
- Posid, T. & Cordes, S. (March, 2014). Comparing apples and oranges: Heterogeneity facilitates across-set discrimination across the lifespan. *Poster presented at the Annual Meeting of the Eastern Psychological Association, Boston, MA.*

- Brazel, D, Posid, T. & Cordes, S. (March, 2014). From incompatible representations: When and how infants compare small and large sets. *Poster presented at the Annual Meeting of the Eastern Psychological Association, Boston, MA.*
- Anderson, U.S. & Cordes, S. (March, 2014). Positive poles first: Early comprehension of relational words in eight-month olds. *Poster presented at the Annual Meeting of the Eastern Psychological Association, Boston, MA.*
- Goldstein, A., Heller, E., & Cordes, S. (March, 2014). Sets within sets: The influence of set membership on numerical estimates. *Poster presented at the Annual Meeting of the Eastern Psychological Association, Boston, MA.*
- Lewis, E., Niemi, L., & Cordes, S. (March, 2014). The effects of emotion on numerical estimation abilities across development. *Poster presented at the Annual Meeting of the Eastern Psychological Association, Boston, MA.*
- Cordes, S., Young, L., & Heller, E. (November, 2013). Feeling outnumbered: Group membership affects numerosity perception. *Paper presented at the Annual Meeting of the Psychonomics Society.*
- Anderson, U. S. & Cordes, S. (October, 2013). A young child's referential associations between quantities and number words and numerals. *Poster presented at the Biennial Meeting of the Cognitive Development Society, Memphis, TN.*
- Hurst, M. & Cordes, S. (October, 2013). Investigating multiple modes of rational number representation: Comparing decimal and fractional magnitude understanding in adults. *Poster presented at the Biennial Meeting of the Cognitive Development Society, Memphis, TN.*
- Posid, T. & Cordes, S. (October, 2013). How high can you count? Probing the limits of young children's counting. *Poster presented at the Biennial Meeting of the Cognitive Development Society, Memphis, TN.*
- Posid, T., Fazio, A., & Cordes, S. (October, 2013). Children's propensity to give in response to increased need and resources. *Poster presented at the Biennial Meeting of the Cognitive Development Society, Memphis, TN.*
- Cordes, S. (September, 2013). When to count: The role of adult input on early numerical abilities. *Invited Talk: University of Connecticut Developmental Psychology Colloquium.*
- Young, L. N. & Cordes, S. (May, 2013). Quantifying a threat: Evidence of a numeric processing bias. *Poster presented at the Annual Meeting of the Association for Psychological Science, Washington D.C.*
- Anderson, U. S. & Cordes, S. (April 2013). When searching for similarity, children spontaneously use perceptual (not categorical) likeness, regardless of processing mode. *Poster presented at the Biennial Meeting of the Society for Research in Child Development, Seattle, WA.*
- Anderson, U. S. & Cordes, S. (April 2013). Focus on the details! Inducing local perceptual processing improves child and adult judgments of numerical sameness. *Poster presented at the Biennial Meeting of the Society for Research in Child Development, Seattle, WA.*
- Cantrell, L, Boyer, T., Cordes, S., & Smith, L. B. (April, 2013). Signal clarity for infant quantity representation. *Paper presented at the Biennial Meeting of the Society for Research in Child Development, Seattle, WA.*
- Posid, T. & Cordes, S. (April 2013). The influence of perceptual variability on preschooler's understanding of cardinality. *Poster presented at Biennial Meeting of the Society for Research in Child Development, Seattle, WA.*
- Posid, T., Huguene, B., & Cordes, S. (April 2013). Stimulus heterogeneity facilitates difficult number judgments in preschoolers. *Poster presented at Biennial Meeting of Society for Research in Child Development, Seattle, WA.*
- Posid, T. & Cordes, S. (April 2013). Two is better than one: Redundant sensory and categorical information facilitates children's numerical judgments. *Poster presented at Biennial Meeting of the Society for Research in Child Development, Seattle, WA.*
- Goldstein, A., Cole, T. & Cordes, S. (April 2013). The development of infant's receptive numerical vocabulary in a preferential looking paradigm. *Poster presented at Biennial Meeting of the Society for Research in Child Development, Seattle, WA.*
- Cole, T. & Cordes, S. (April 2013). How do parents read counting books to their preverbal infants? An observational study. *Poster presented at Biennial Meeting of Society for Research in Child Development, Seattle, WA.*
- Lamoureux, J. A., Raiche, E. M., Barbera, K. A., Corwin, E. R., & Cordes, S. (March, 2013). Gender and stereotype threat effects on performance of a predictive learning task. *Poster presented at Annual Meeting of the Eastern Psychological Association.*
- Young, L. N. & Cordes, S. (November, 2012). Time and number under the influence of emotion. *Paper presented at the Annual Meeting on Object Perception, Attention, and Memory (OPAM), Minneapolis, MN.*
- Young, L. N., Cordes, S., & Winner, E. (August, 2012). Access to a Musical Instrument Tops the List of Predictors of Academic Achievement Across SES. *Paper presented at the Annual Convention of the American Psychological Association, Orlando, FL.*

- Young, L. N., Winner, E., & Cordes, S. (August, 2012). Heightened Incidence of Depressive Symptoms in Adolescents Involved in the Arts. *Paper presented at the Annual Convention of the American Psychological Association, Orlando, FL.*
- Posid, T. & Cordes, S. (June, 2012). How High Can You Count? Probing the Limits of Young Children's Counting. *Poster presented at Biennial Meeting of the International Conference on Infant Studies, Minneapolis, MN.*
- Cordes S., Heller, L., & Putnam, M. M. (October, 2011). The Log to Linear Shift for Other Ordinal Sequences. *Paper presented at the Biennial Meeting of the Cognitive Development Society, Philadelphia, PA.*
- Cordes, S., Hopkins, E. J. & Brannon, E. M. (March, 2011). Verbal Labels Enhance Large Number Discrimination in Infancy. *Poster presented at the Biennial Meeting of the Society for Research in Child Development, Montreal, Quebec.*
- Cordes, S. (February, 2011). The Young Numerical Mind. *Invited Talk: University of Massachusetts, Boston Talks in Cognitive Science.*
- Cordes, S. & Brannon, E. M. (July, 2010). Size Discriminations in Infancy: Less Strength in Numbers. *Invited poster presented at the 24<sup>th</sup> International Attention and Performance Symposium on Space, Time, and Number, Paris, France.*
- Cordes S. (May, 2010). What Counts to Infants? Early Appreciations of Quantity. *Invited Talk: Children's Hospital of Boston Laboratories of Cognitive Neuroscience.*
- Cordes S. (April, 2010). What Counts to Infants? Early Appreciations of Quantity. *Invited Talk: Harvard Laboratory of Developmental Studies Colloquium Series.*
- Cordes, S. (November, 2009). Quantity in the Preverbal Mind. *Talk: First Meeting of Boston Area Cognitive Development Researchers.*
- Cordes, S. (October, 2009). What Counts to Infants? Early Appreciations of Quantity. *Invited Talk: Boston College Lynch School of Education.*
- Cordes, S., Platt, M., & Brannon, E. M. (April, 2009). Hot Handed Kids and Gambling Adults: Strategy Reversal in Risky Decision Making from Childhood to Adulthood. *Poster presented at the Annual Meeting of the Society for Research in Child Development, Denver, CO.*
- Cordes, S. (March, 2009). The Relative Importance of Number in Infancy. *Invited Talk: Duke University Psychology Department.*
- Cordes, S. (December, 2008). Quantitative Competencies in Infancy and Beyond. *Invited Talk: Stanford University Psychology Department.*
- Cordes, S. (November, 2008). Quantitative Competencies in Infancy and Beyond. *Invited Talk: Macalaster College Psychology Department.*
- Cordes, S., Williamson, L. L., Alves, K., Bhave, S. R., Rodriguez, R., Wetsel, W. C., & Meck, W. H. (November, 2008). The Role of the Norepinephrine Transporter in Interval Timing. *Poster presented at Annual Meeting of the Society for Neurosciences, Washington D. C.*
- Cordes, S. (November, 2008). Quantitative Competencies in Infancy and Beyond. *Invited Talk: Boston College Psychology Department*
- Cordes, S. (November, 2008). Quantitative Competencies in Infancy and Beyond. *Invited Talk: The Ohio State University Psychology Department.*
- Cordes, S., Suanda, S., & Brannon, E. M. (March, 2008). Developmental Limitations on Numerical Ordinal Abilities. *Poster presented at the XVIth Biennial International Conference on Infant Studies, Vancouver, BC.*
- Cordes, S. (March, 2008). Quantity representations in infants, adults, and non-human animals. *Invited Talk: University Massachusetts, Amherst Psychology Department.*
- Cordes, S. (January, 2008). Quantity representations in infants, adults, and non-human animals. *Invited Talk: University of North Carolina, Chapel Hill Psychology Department.*
- Cordes, S. & Brannon, E. M. (October, 2007). The Difficulties Of Representing Continuous Extent In Infancy: Using Number Is Just Easier. *Poster presented at the annual meeting of the Cognitive Development Society, Santa Fe, NM.*
- Cordes, S., Lutz, D., & Brannon, E. M. (March, 2007). Discriminations of Small from Large Sets in Human Infants. *Poster presented at the biennial meeting of the Society for Research in Child Development, Boston, MA.*

- Cordes, S. (March, 2007). Many vs. much: The relationship between number and continuous extent representations in infancy. *Invited talk for the Duke University Center for Cognitive Neuroscience Lunchtime Magnitude Processing Colloquium Series.*
- Cordes, S. (March, 2006). Time Left Revisited: Temporal Subtraction in the Mouse. *Paper presented at the Annual Meeting of the International Conference on Comparative Cognition, Melbourne Beach, FL.*
- Pleil, K., Cordes, S., Meck, W.H., & Williams, C. L. (March, 2006). Sex Differences in Timing: Possible Neuroendocrine Mechanisms. *Poster presented at the Annual Meeting of the International Conference on Comparative Cognition, Melbourne Beach, FL.*
- Cordes, S. (June, 2005). The Psychophysics of Abstract Quantities in Mouse and Man. *Invited Talk: Duke University Center for Cognitive Neuroscience.*
- Cordes, S. (February, 2005). Representations of Abstract Quantities in Mouse and Man. *Invited Talk: Massachusetts Institute of Technology.*
- Cordes, S., King, A. P., & Gallistel, C. R. (October, 2004). Time Left Revisited: Temporal Subtraction in the Mouse. *Poster presentation at the annual meeting of the Society for Neurosciences, San Diego, CA.*
- Cordes, S., Gallistel, C. R., & Gelman, R. (November, 2003). Nonverbal Arithmetic in Humans. *Poster presented at annual meeting of OPAM (Object Perception Attention and Memory), Vancouver, BC.*
- Cordes, S., & Gallistel, C. R. (August, 2002). Nonverbal Arithmetic. *Invited talk: Lab of Russell Church, Brown University.*
- Gelman, R., Gallistel, C. R., & Cordes, S. (March, 2002). Counting and Arithmetic Reasoning. *Invited talk: Harvard University.*
- Cordes, S., Gallistel, C. R., & Gelman, R. (June, 2002). Nonverbal Arithmetic in Humans. *Poster presented at annual meeting of the American Psychological Society, New Orleans, LA.*
- Cordes, S., Gelman, R., Gallistel, C. R., & Whalen, J. (June, 2001). Counting while talking: Different signatures for verbal and nonverbal counting. *Poster presented at annual meeting of the American Psychological Society, Toronto.*
- Cordes, S., Gelman, R., Gallistel, C. R., & Whalen, J. (December, 1999). Counting while talking: New evidence for nonverbal counting in humans. *Poster presented at UCLA's Science Poster Day, Los Angeles.*

### **Press**

- APA press release:* Teens in arts report depressive symptoms, study says:  
<http://www.apa.org/news/press/releases/2012/11/teens-depressive.aspx>
- Chicago Tribune:* Depressed teens more likely to make arts, study says:  
<http://www.chicagotribune.com/news/local/ct-x-teens-arts-depression-20121212,0,3027398.story>
- Greater Good Magazine:* Why is your preschooler not sharing?  
[https://greatergood.berkeley.edu/article/item/why\\_is\\_your\\_preschooler\\_not\\_sharing](https://greatergood.berkeley.edu/article/item/why_is_your_preschooler_not_sharing)

### **Community Outreach**

- Math Note Contributor, Crespo, A. (2020) *Lia and Luis: Who has More?* Charlesbridge, MA, USA. (Winner of 2021 Mathical Prize)
- Invited Speaker: “Fostering Early Math and Science”, *Raising a Reader Foundation of Massachusetts Staff Training Event.* Spoke with staff at the Raising a Reader Foundation regarding how to inform parents about integrating numerical concepts into book reading (December, 2014).
- Invited Speaker: “Applying Early Math Research to Education”, *Early Literacy Council of Springfield, MA.* Spoke to preschool/Head Start educators on how to integrate early math learning into the classroom (April, 2015).

### **Teaching Experience**

- PS 5561 Mathematical Cognition and Learning (Spring 2019)
- PS 2260 Developmental Psychology (Fall 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022)

PS 3368 Infancy (Spring 2011, 2016, 2021, 2023)  
 PS 5560 Advanced Topics in Cognitive Development (Fall 2010; Spring, 2013, 2015, 2017, 2020, 2022)  
 PS 6590 Scientific Writing (Spring 2021)  
 Guest Lecturer, Developmental Psychology (Fall 2007)  
 Instructor, Quantitative Methods (Summer 2005)  
 Guest Lecturer, Graduate Course in Mathematical Cognition (Spring 2005)  
 Teaching Assistant, Advanced Topics in Cognitive Science (Spring 2005)  
 Guest Lecturer, Cognitive Science (Spring 2004)  
 Guest Lecturer, Honors Conditioning and Learning (Spring 2004)  
 Instructor, Infant and Child Development Lab (Spring 2003)  
 Teaching Assistant, Honors Seminar in Cognitive Development (Spring 2002)

### **Departmental and University Committees**

2009-	Graduate Admissions and Recruitment Committee (Chair since 2010)
2015-	Graduate Evaluation Committee
2016-	Graduate Program Committee
2017-	Bachelor of Science Curriculum Subcommittee (Chair)
2017-	Peer Review of Teaching Committee
2018-	Faculty Nominating Committee
2020-	Graduate Student Mentorship Committee
2020-	Climate and Mental Health Committee
2020-	Diversity and Inclusion Committee
2020-	Chair Advisory Committee
2009-2010	Goals Committee
2010-2012	University Internal Review Board Committee
2009-2011	Colloquium Committee
2010-2011	Strategic Planning and Preparation for External Review Committee
2012-2013	Developmental Psychology Faculty Search Committee
2013-2014	Developmental Psychology Faculty Search Committee
2013-2014	Senior Hiring Committee
2014-2015	Developmental Psychology Faculty Search Committee
2014-2015	Goals Committee (Chair)
2017-2018	Social Psychology Faculty Search Committee
2018-2019	Developmental Psychology Faculty Search Committee (Chair)
2020-2021	Diversity and Inclusion Hiring Committee

### **Mentoring**

#### ***Graduate and Postdoctoral Students***

##### *Postdoctoral Students:*

Stacey Santos (2016-present)  
 Nadia Chernyak (2015-2018)

##### *Current Position*

Boston College  
 Assistant Professor, University of California, Irvine

Ursula S. Anderson (2012-2014)

University of Delaware Senior Research Analyst

*Doctoral Students:*

Carolina Alvarez (2022-present)

Boston College

Taylor Stone (2022-present)

Boston College

Lindsey Hildebrand (2018-present)

Boston College

Karina Hamamouche (Ph.D. 2019)

Assistant Professor, Butler University

Sophie Savelkouls (Ph.D. 2019)

Research Associate II, WestEd

Michelle Hurst (Ph.D. 2017)

Postdoctoral Researcher, University of Chicago

Laura Niemi (2011-2013, Ph.D. 2016)

Assistant Professor, Cornell University

Tasha Posid (Ph.D. 2015)

Assistant Professor, The Ohio State University

*Masters Students:*

Thomas Cole (M.A. 2013)

Data Analyst, Rez-1 (Wellesley, MA)

*Lab Coordinators:*

Elizabeth Heller Murray (2009-2011)

Assistant Professor, Temple University

Alison Goldstein (2011-2014)

Doctoral Student, University of California, Irvine

Emma Lazaroff (2014-2016)

Postdoctoral Researcher, University Wisconsin, Madison

Raychel Gordon (2016-2018)

Doctoral Student, University of Maryland

Lauren Sprague (2018- 2019)

Doctoral Student, Florida State University

Hailey Moore (2019-2020)

Research Assistant, Children's National Hospital

Hayley Liebenow (2019-2020)

Doctoral Student, UNC Greensboro

Lesenia Fish (2019-2022)

Doctoral Student, Emory University

Alyson Wong (2020-present)

Boston College

Kathryn Jacoby (2022-present)

Boston College

*External Student Support*

2011 – 2013 Georgia Institute of Technology NSF FACES Grant to Ursula Anderson, \$35,000

2012 – 2014 NSF SBE Minority Postdoctoral Research Fellowship to Ursula Anderson

2013 – 2014 National Endowment for the Arts Research Grant to Laura Niemi Young, \$26,000

2014 – 2016 Natural Sciences and Engineering Research Council of Canada Postgraduate Scholarship to Michelle Hurst

2020 Boston College Center for Human Rights and International Justice Summer Research Grant to Lindsey Hildebrand, \$1,050

***Undergraduate Students***

*Undergraduate Theses Supervised (49)*

2011 Marisa Putnam “*The Log to Linear Shift: A Function of Mastery*”

2012 Brynn Huguenel “*Development of the abstraction principle within the cardinal principle level: The effects of heterogeneity on ordinal and estimation tasks*”

2012 Cara Picano “*How Infants & Young Children Understand Small vs. Large Numbers: Manual Search Task Across Development*”

2013 Lila Abboud “*The stability of symmetry preferences*”

2013 Allyse Fazio “*Children’s propensity to give in response to increased need and resources*”

2013 Amy Lipton “*Can categorical and numerical judgments be swayed by visual processing style?*”

2013 Jacqueline Mendoza “*The effects of verbal labels on numerical discrimination in infancy*”

2013 Joseph Schade “*The effect of emotion and autistic traits on time processing in adults*”



2013	Mackenna Woodring	<i>“Underestimating the opponent’s big lead in political polls”</i>
2014	Nicole Borglum	<i>“The development of the mental representation of pitch in space: The SPARC effect in children”</i>
2014	Danielle Brazel	<i>“From incompatible numerical representations: When and how infants compare small and large sets”</i>
2014	Siobhan Gavagan	<i>“The influence of emotion on time and number estimation”</i>
2014	Laura Hymes	<i>“Evaluating the development and influence of math-gender stereotypes across the lifespan”</i>
2014	Emily Lewis	<i>“The effects of emotion on numerical estimation: A developmental perspective”</i>
2014	Marisa Massaro	<i>“Mental representations of rational numbers and how external visual references impact them”</i>
2014	Solange Moran	<i>“Understanding the effects of an induced bias in number perception”</i>
2014	Alexandra Szczerpepa	<i>“Who got more? The effects of ownership and perceived deservingness on children’s number estimates”</i>
2015	Haley Boyce	<i>“Touchscreen study on infants’ understanding of number”</i>
2015	Kelsey Carey	<i>“The impacts of book reading on infant numerical discrimination using a change-detection paradigm”</i>
2015	Carolyn Greisser	<i>“Fraction distraction: The effect of rational numbers in word problems”</i>
2015	Emily Kleinlein	<i>“The development and influence of math-gender stereotypes across the lifespan”</i>
2015	Kelly Miller	<i>“Examining the perceived association between antisocial personalities and math professions”</i>
2015	Charlotta Relander	<i>“Adults’ understanding of rational numbers in symbolic and non-symbolic form”</i>
2015	Alexandra Zax	<i>“The effects of emotion on numerical perception in adults”</i>
2016	Nicole Brosnan	<i>“Concrete vs. abstract thinking: A relevant factor in the parent-child transmission of math beliefs”</i>
2016	Cara Lucke	<i>“Parent interactive reading as a predictor of cognitive development”</i>
2016	Olivia Noe	<i>“Investigating the intersection of sharing behavior and understanding of division in young children”</i>
2016	Caitlin Slotter	<i>“The subjective experience of math: An investigation into student attitudes toward math oriented subjects”</i>
2016	Jennifer Taylor	<i>“The effects of emotional faces on children’s numerical and counting abilities”</i>
2016	Ellen Yang	<i>“An evaluation of baseline data concerning intensive orchestral training and predictors of academic achievement”</i>
2017	Kelsey Hawthorne	<i>“Social interactions bias numerical perception in preschoolers”</i>
2017	Maura Keefe	<i>“The impact of cognitive load on temporal and numerical processing”</i>
2017	Amanda Kuron	<i>“Labeling fractions: How linguistic input permeates mathematical thinking”</i>
2017	Monica Lee	<i>“Spontaneous focusing on number in adults”</i>
2017	Meghan Santry	<i>“Rational number representation: Mapping visual representations onto symbolic ones”</i>
2017	Stephanie Parent	<i>“The impact of verbal labels on numerical discrimination in infancy”</i>
2018	Aziza Alam	<i>“Exploring the effects of gesture on children’s proportional reasoning”</i>
2018	Kelsey Child	<i>“Representing cumulative area: Does the number of items determine sensitivity to continuous properties?”</i>
2018	Kelsa Kazyak	<i>“Contextual features affect children’s attention to number”</i>
2018	Carolyn Patterson	<i>“Framing effects on proportional reasoning in young children”</i>
2019	Eileen Du	<i>“The effect of set size on cumulative area and cumulative duration estimates”</i>
2019	Kylie Gallo	<i>“Shifting perceptions of non-symbolic timing with symbolic feedback”</i>
2019	Auburn Stephenson	<i>“Time to analyze time: Exploring children’s developing temporal abilities in relation to scholastic achievement”</i>
2020	Tara Coffey	<i>“The influence of time pressure on math performance”</i>
2020	Elizabeth Kroll	<i>“Impact of induced stress on susceptibility to framing effect by domain”</i>

2020	Celine Jia Rong Lim	<i>“Assumptions underlying children’s gender stereotypes about math and spatial abilities differentially relate to domain-specific anxiety”</i>
2020	Madalyn Prince	<i>“The development of gender-based evaluations of past sharing behavior”</i>
2020	Alyson Wong	<i>“Examining the effects of different types of gestures on children’s proportional reasoning”</i>
2021	Patrick Stallwood	<i>“Comparing sharing: The impact of group membership on sharing evaluations”</i>
2022	Shannon Hayes	<i>“The impact of receiving help for children’s inferences about brilliance: Effects of age, gender, and academic domain”</i>
2022	Erin Kwon	<i>“Understanding quantities: The development of the approximate number sense in infants”</i>
2022	Kathryn Jacoby	<i>“Backlash against STEM gender stereotype violations”</i>
2022	Catherine Park	<i>“The effect of competition on math and reading gender stereotypes in children”</i>

External Undergraduate Theses Supervised (through partnership with University of Bath)

2015	Beth Sandham
2016	Yi Qi Chloe Ang
2016	Becky Kroll
2017	Vanessa Turnbull
2021	Eilidh Shaw
2022	Gemma Bowman

Boston College Undergraduate Student Support

Fall, 2009	Undergraduate Research Mentor Fellowship (A. Minogue; K. Crimmons)
Spring, 2010	Undergraduate Research Mentor Fellowship (A. Minogue; K. Crimmons)
Summer, 2010	Undergraduate Research Mentor Fellowship (K. Severance; M. Phruksachart; K. McCarthy; R. Smith; K. Pierce)
Fall, 2010	Undergraduate Research Mentor Fellowship (K. Vinck; K. McCarthy)
Spring, 2011	Undergraduate Research Mentor Fellowship (K. McCarthy; M. Straub)
Summer, 2011	Undergraduate Research Mentor Fellowship (L. Monahan; J. Mendoza; C. Picano)
Fall, 2011	Undergraduate Research Mentor Fellowship (L. Monahan; C. Malizia)
Spring, 2012	Undergraduate Research Mentor Fellowship (L. Monahan)
Summer, 2012	Undergraduate Research Mentor Fellowship (J. Mendoza; L. Hymes; M. Woodring; S. Kim)
Fall, 2012	Undergraduate Research Mentor Fellowship (L. Hymes; S. Kim)
Spring, 2013	Undergraduate Research Mentor Fellowship (S. Kim; E. Lewis)
Summer, 2013	Undergraduate Research Mentor Fellowship (L. Hymes; H. Boyce; N. Borglum; A. Szczerepa)
Summer, 2013	Senior Advanced Study Grant to Alexandra Szczerepa
Summer, 2013	Sophomore Advanced Study Grant to Haley Boyce
Fall, 2013	Undergraduate Research Mentor Fellowship (H. Boyce; N. Snapper; L. Sweitzer)
Spring, 2014	Undergraduate Research Mentor Fellowship (N. Brosnan; C. Griesser; C. Slotter)
Summer, 2014	Undergraduate Research Mentor Fellowship (A. Lanza; C. Eastlack; K. Miller; C. Greisser)
Fall, 2014	Undergraduate Research Mentor Fellowship (C. Eastlack; A. Raghuvanshi; A. Lanza)
Spring, 2015	Undergraduate Research Mentor Fellowship (C. Eastlack; A. Lanza; O. Noe)
Summer, 2015	Undergraduate Research Mentor Fellowship (E. Gross; C. Lucke; O. Noe; C. Slotter)
Fall, 2015	Undergraduate Research Mentor Fellowship (K. Aguayo; J. Dunstan)
Spring, 2016	Undergraduate Research Mentor Fellowship (M. Lee, S. Parent)
Summer, 2016	Undergraduate Research Mentor Fellowship (A. Kuron, S. Parent, A. Alam)
Fall, 2016	Undergraduate Research Mentor Fellowship (A. Alam, K. Kazyak)
Spring, 2017	Undergraduate Research Mentor Fellowship (A. Alam, K. Kazyak)
Summer, 2017	Undergraduate Research Mentor Fellowship (A. Alam, K. Kazyak, J. Moscarelli)
Summer, 2017	Senior Advanced Study Grant to Aziza Alam

Fall, 2017 Undergraduate Research Mentor Fellowship (B. Fogarty, E. Kroll)  
Spring, 2018 Undergraduate Research Mentor Fellowship (B. Fogarty, E. Kroll)  
Summer, 2018 Undergraduate Research Mentor Fellowship (A. Stephenson, E. Du)  
Summer, 2018 Senior Advanced Study Grant to Auburn Stephenson  
Fall, 2018 Undergraduate Research Mentor Fellowship (A. Herron, E. Kroll)  
Spring, 2019 Undergraduate Research Mentor Fellowship (C. Lim, H. Moore)  
Summer, 2019 Undergraduate Research Mentor Fellowship (H. Moore)  
Fall, 2019 Undergraduate Research Mentor Fellowship (H. Moore)  
Spring, 2020 Undergraduate Research Mentor Fellowship (H. Moore)  
Summer, 2020 Undergraduate Research Mentor Fellowship (C. Park, P. Stallwood, E. Beall)  
Fall, 2020 Undergraduate Research Mentor Fellowship (C. Park, E. Beall)  
Spring, 2021 Undergraduate Research Mentor Fellowship (C. Park, E. Beall)  
Summer, 2021 Undergraduate Research Mentor Fellowship (S. Cheng, S. Hayes, K. Jacoby, E. Kwon, C. Park)  
Fall, 2021 Undergraduate Research Mentor Fellowship (S. Cheng, A. Kohler, B. Wekwerth)  
Spring, 2022 Undergraduate Research Mentor Fellowship (S. Cheng, A. Kohler, F. Ricca)  
Summer, 2022 Undergraduate Research Mentor Fellowship (J. West, Y. Zhang, A. Kohler, S. Gardner)  
Fall, 2022 Undergraduate Research Mentor Fellowship (Y. Lee, S. Gardner, M. Gribble)