

A. Personal Information

Koleen McCrink
Associate Professor of Psychology
Barnard College, Columbia University

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Barnard College- Psychology
Milbank Hall
New York, NY 10027

B. Degrees in Higher Education

Ph.D. Yale University, Psychology, 2007 (attended 2002-2007)
Thesis: *Mathematical Operations in Infancy and Adulthood*
Advisor: Karen Wynn

M.Ph. Yale University, Psychology, 2004

M.S. Yale University, Psychology, 2003

B.A. Rutgers University, 2000 (attended 1996-2000)

C. Additional Professional Training

Postdoctoral Researcher Harvard University, 2007 - 2009
Psychology Department

Visiting Researcher INSERM (Institut National de la Santé et de la Recherche Médicale), Cognitive
Neuroscience Unit, 2005
Studied infant ERP and adult psychophysical techniques

D. Professional Experience in Higher Education

Associate Professor Barnard College, Columbia University, 2018-present
Psychology Department

Assistant Professor Barnard College, Columbia University, 2009-2018
Psychology Department

Instructor Harvard University, 2008
Psychology Department

Adjunct Instructor Southern Connecticut State University, 2007
Psychology Department

Lab Coordinator University of Rochester, 2000-2002

E. Academic and Professional Honors

Presidential Research Award (2017)
Barnard College, Columbia University

James Grossman Prize for Best Dissertation in Psychology (2007)
Yale University

Graduate Research Fellowship (2004-2007)
National Science Foundation

Mabel Smith Douglass Honors Scholarship (1996 - 2000)
Rutgers University

Edward J. Bloustein Scholarship (1996 - 2000)
Rutgers University

F. Current Membership in Professional Societies

American Psychological Society
Society for Research in Child Development
International Congress on Infant Studies
Cognitive Development Society

G. Courses Taught

Developmental Psychology (lecture) (Barnard)
Developmental Psychology (lab), co-instructor (Barnard)
Individual Projects, mentoring Senior Theses (Barnard)
Science and Scientists (Barnard)
Core Knowledge (Barnard, Columbia)
Introduction to Psychology (Barnard)
The Mental Life of Babies (Barnard)
Origins of Knowledge (Harvard)
Cognition (Southern Connecticut)

Graduate Dissertation Committees, outside member: Dobromir Rahnev (GSAS, 2012); Jonathan Vitale (TC, 2011); Azadeh Jamalian (TC, 2014)

H. Publications and Creative Work**Journal Articles**

Note: An asterisk indicates a student co-author. Authors are listed by contribution, with the first author contributing the most to the publication. In the case of a student first author, the last author is the senior scientist in whose laboratory the research was conducted and the student was mentored.

Braham*, E., Libertus, M. & McCrink, K. (2018). Increasing children's spontaneous focus on number through guided parent-child interactions in a children's museum. *Developmental Psychology*, 54(8):1492-1498.

McCrink, K. & de Hevia, M.D. (2018). From innate spatial biases to enculturated spatial cognition: The case of spatial associations in number and other sequences. *Frontiers in Psychology*, 9(415), doi: 10.3389/fpsyg.2018.00415.

McCrink, K. & Hubbard, T. (2017). Dividing attention increases operational momentum. *Journal of Numerical Cognition*, 3(2), 230–245. doi:10.5964/jnc.v3i2.34

Macchi Cassia, V., Bulf, H., McCrink, K., & de Hevia, M.D. (2017). Operational momentum during ordering operations for size and number in 4-month-old infants. *Journal of Numerical Cognition*, 3(2), 270–287, doi:10.5964/jnc.v3i2.67

Göbel, S., McCrink, K., Fischer, M., & Shaki, S. (2017). Observation of directional storybook reading influences young children's counting direction. *Journal of Experimental Child Psychology*, 166, 49-66.

Opfer, J. & McCrink, K. (2017). How *not* to develop a sense of number. *Behavioral and Brain Sciences*, 40, e184.

Polinsky*, N., Grehl*, M., Perez, J., & McCrink, K. (2017). Encouraging spatial talk: Using children's museums to bolster spatial reasoning. *Mind, Brain, and Education*. Early View at: doi:10.1111/mbe.12145.

McCrink, K. & Caldera*, C., & Shaki, S. (2017). The Early Construction of Spatial Attention: Culture, Space, and Gesture in Parent–Child Interactions. *Child Development*. Early View at: doi:10.1111/cdev.12781

McCrink, K., Perez, J. & Baruch*, E. (2017). Number prompts left-to-right spatial mapping in toddlerhood. *Developmental Psychology*, 53(7), 1256-1264.

McCrink, K., Shafto, P. & Barth, H. (2016). The relationship between non-symbolic multiplication and division in childhood. *Quarterly Journal of Experimental Psychology*, 70(4), 686-702.

Rugani, R., McCrink, K., de Hevia, M.D., Vallortigara, G., & Regolin, L. (2016). Ratio calculations over discrete magnitudes by newly hatched domestic chicks (*gallus gallus*). *Scientific Reports*, 6, 30114.

McCrink, K. & Shaki, S. (2016). Culturally Inconsistent Spatial Structure Reduces Learning. *Acta Psychologica*, 169, 20-26.

Macchi Cassia, V., McCrink, K., de Hevia, M.D., Gariboldi, V., & Bulf, H. (2016). Operational Momentum and size ordering in preverbal infants. *Psychological Research*. DOI 10.1007/s00426-016-0750-9

McCrink, K. & Spelke, E. (2016). Non-symbolic division in childhood. *Journal of Experimental Child Psychology*, 142, pp 66-82.

McCrink, K., & Galamba*, J. (2015). The impact of symbolic and non-symbolic quantity on spatial learning. *PLoS One*.

McCrink, K., & Opfer, J. (2014). Development of Spatial-Numerical Associations. *Current Directions in Psychological Science*. 23(6), 439-445.

McCrink, K., Shaki, S. & Berkowitz*, T. (2014). Culturally-Driven Biases in Preschoolers' Spatial Search Strategies. *Cognitive Development*, 30, 1-14.

Knops, A., Zitzmann, S. & McCrink, K. (2013). Examining the presence and determinants of operational momentum in childhood. *Frontiers in Psychology*, 4(325), doi: 10.3389/fpsyg.2013.00325.

McCrink, K., Pica, P., Spelke, E.S., & Dehaene, S. (2013). Non-Symbolic Halving in an Amazonian Indigene Group. *Developmental Science*, 16(3), 451-462.

McCrink, K. & Spelke, E. (2010). Core multiplication in childhood. *Cognition*, 116, 204-216.

McCrink, K., & Wynn, K. (2009) Operational momentum in large-number addition and subtraction by 9-month-old infants. *Journal of Experimental Child Psychology*, 104, 400-408.

McCrink, K., Bloom, P. & Santos, L. (2009) Children's and adults' judgments of equitable resource distributions. *Developmental Science*, 13(1), 37-45.

McCrink, K., Dehaene, S., & Dehaene-Lambertz, G. (2007) Moving along the number line: The case for operational momentum. *Perception and Psychophysics*, 69(8), 1324-1333.

McCrink, K. & Wynn, K. (2007) Ratio abstraction by 6-month-old infants. *Psychological Science*, 18, 740-746.

vanMarle, K., Aw, J., McCrink, K. & Santos, L. (2006) How capuchin monkeys (*Cebus apella*) quantify objects and substances. *Journal of Comparative Psychology*, 120(4), pp. 416-426.

McCrink, K. & Wynn, K. (2004) Large-number addition and subtraction by 9-month-old infants. *Psychological Science*, 15, 776-781.

Chapters in Books

McCrink, K. & Birdsall, W*. (2015). Arithmetic in Infancy. Oxford Handbook of Numerical Cognition. Eds. Cohen-Kadosh, R. & Dowker, A.

McCrink, K. (2015). Intuitive Non-Symbolic Arithmetic. Evolutionary Origins and Early Development of Basic Number Processing. Eds. Geary, D., Berch, D., Mann Koepke, K.

McCrink, K. & Wynn, K. (2008) Mathematical Reasoning. Encyclopedia of Infant and Early Childhood Development. Eds. M. Haith & J. Benson. Vol. 2, 280-289.

Invited Talks at Institutions

McCrink, K. (2018). Spatial biases in childhood. Invited Talk at the Brown University Cognition Seminar Series.

McCrink, K. (2018). Spatial biases in childhood. Invited Talk at the University of Pennsylvania Interdisciplinary Mind and Brain Seminar Series.

McCrink, K. (2017). Spatial biases in childhood. Invited Talk at the Wesleyan University Summer Lecture Series.

McCrink, K. (2017). Spatial biases in childhood. Invited Talk at the Boston University Developmental Science Colloquium.

McCrink, K. (2016). Spatial-numerical interactions in early childhood. Invited Talk at the Yale University series on cognitive psychology.

McCrink, K. (2015). Learning in a spatial-numerical context in childhood and adulthood. Invited talk at University of Delaware developmental psychology series.

McCrink, K. (2015). Learning in a spatial-numerical context in childhood and adulthood. Invited talk at Temple University "Research in Spatial Cognition" series.

McCrink, K. (2014). Learning in a spatial-numerical context in childhood and adulthood. Invited talk at Seton Hall University psychology colloquium series.

McCrink, K. (2013). Mathematical operations throughout the lifespan. Invited colloquium speaker at Rutgers University Psychology Department.

McCrink, K. (2011) Mathematics Throughout the Lifespan. Invited speaker at Yale University series on developmental psychology.

McCrink, K. (2011) Mathematics Throughout the Lifespan. Invited colloquium speaker at Columbia University Psychology Department.

McCrink, K. (2011) Mathematics Throughout the Lifespan. Invited colloquium speaker at City University, Brooklyn Psychology Department.

McCrink, K. (2009) Arithmetic operations throughout the lifespan. Invited Colloquium, UMass Boston, February.

Invited Talks at Conferences

McCrink, K. (2013). Early development of numerical cognition. Invited talk, presented at the 2013 NICHD Mathematical Cognition conference for NIH grantees, Washington DC.

McCrink, K. (2010). Using number in social situations: The case of generosity. Invited talk, presented at the International Conference on Infant Studies, Baltimore, MD.

McCrink, K. (2006). The development of arithmetical reasoning in infancy. Invited talk presented at the International Conference on Logical and Mathematical Thinking in Early Childhood Education. Madrid, Spain.

Chaired Symposia

McCrink, K. (2016) Invited Symposium at the International Congress for Infant Studies (speaker Paul Bloom), Chair: Just Babies: The origins of good and evil. New Orleans, LA, USA.

McCrink, K. (2015). The Dynamics of Number Representation: Conceptual, Strategic, and Developmental Change in a Numerical Context. Organizer and chair of symposium. Society for Research in Child Development biennial meeting, Philadelphia PA.

McCrink, K. (2011) Interactions of Space, Number, and Ordering in Infancy and Early Childhood. Organizer and chair of symposium. Society for Research in Child Development biennial meeting, Montreal, Canada.

McCrink, K. (2009) Neural and Behavioral Origins of Mathematics. Organizer and chair of symposium. Talk presented at the Cognitive Development Society, San Antonio, TX.

McCrink, K., Santos, L., & Bloom, P. (2007) Cues to generosity in children and adults. Chair of symposium. Symposium talk presented at SRCD, Boston, MA.

Conference Oral Presentations

McCrink, K., Dunn, H.*, Bernstein, N.*, Macchi Cassia, V., Bulf, H., & de Hevia, M.D. (2018). Interactions of Space and Arithmetic: Operational Momentum in Preschool Children. Talk presented at the Mathematical Cognition and Learning Society, Oxford, UK.

McCrink, K., Dunn, H.*, Bernstein, N.*, Macchi Cassia, V., Bulf, H., & de Hevia, M.D. (2017). Interactions of Space and Arithmetic: Operational Momentum in Preschool Children. Talk presented at the Cognitive Development Society (CDS) biennial meeting, Portland, OR, USA.

Braham, E., Libertus, M., & McCrink, K. (2017). Improving Young Children's Spontaneous Focus on Number Through Guided Parent-Child Interactions in a Children's Museum. Talk presented at the Cognitive Development Society (CDS) biennial meeting, Portland, OR, USA.

McCrink, K., Perez, J. & Baruch*, E. (2015). Number prompts left-to-right spatial mapping in toddlerhood. Talk presented at the Cognitive Development Society (CDS) biennial meeting, Columbus, OH, USA.

McCrink, K. (2015). Spatial-Numerical Flow and Memory in Young Children. Talk presented at the Society for Research in Child Development biennial meeting, Philadelphia PA.

McCrink, K., Birdsall, W*. & Caldera, C*. (2011). Parental Transmission of Left-to-Right Spatial Structuring on Early Childhood. Talk presented at the Cognitive Development Society biennial meeting, Philadelphia PA.

McCrink, K. (2011) The Early Roots and Later Implications of Culturally-Determined Spatial Biases. Talk presented at the Society for Research in Child Development, Montreal, Canada.

McCrink, K. (2009). Spatial-numerical interactions and arithmetic. Talk presented at the Cognitive Development Society, San Antonio, TX.

McCrink, K. (2006). Interactions of space and number during arithmetic operations: Operational momentum in adults and infants. Talk presented New England Mini Conference for Infant Studies (NEMCIS) at Amherst, MA.

McCrink, K., Bloom, P. & Santos, L. (2006). Children's use of proportion and overall amount when determining generosity. Talk presented at the Yale/Harvard Developmental Social Psychology Workshop. Cambridge, MA.

McCrink, K. & Wynn, K. (2005). Analog magnitudes and operations in infancy. Symposium talk presented at SRCD, Atlanta, GA.

Aslin, R., Fiser, J., & McCrink, K. (2002). Statistical learning of visual shape sequences and spatial arrangements by 8-month-olds. Symposium talk presented at ICIS Toronto, Canada.

Conference Poster Presentations

Polinsky*, N., Grehl*, M., & McCrink, K. (2017). Encouraging spatial talk: Using children's museums to bolster spatial reasoning. Poster presented at the Cognitive Development Society (CDS), Portland, OR, USA.

McCrink, K. (2016). Memory for Linear and Non-Linear Structures in Infancy. Poster presented at the International Congress for Infant Studies, New Orleans LA, USA.

Macchi Cassia, V., de Hevia, M.D., Bulf, H., & McCrink, K. (2016). Operational momentum for size ordering in 4-month-old infants. Poster presented at the International Congress for Infant Studies, New Orleans LA, USA.

McCrink, K., Caldera*, C. & Shaki, S. (2016). The Early Construction of Spatial Attention: Culture, Space, and Gesture in Parent-Child Interactions. Poster presented at the Budapest Central Europe Conference for Cognitive Development (BCCCD), Budapest, Hungary.

Polinsky*, N., Grehl,* M., Perez, J. & McCrink, K. (2015). Spatial Language and Creativity Training in a Naturalistic Situation: Using Children's Museums to Bolster Learning. Poster presented at the Association for Psychological Science (APS), New York NY.

Baruch, E*., Perez, J., & McCrink, K. (May, 2015). Spatial Mapping in Toddlers: Effects of Numerical and Non-Numerical Information. Poster presented at the Association for Psychological Science (APS), New York NY.

Macchi Cassia, V., Gariboldi, V., Bulf, H., de Hevia, M.D. & McCrink, K (2015). Operational momentum during the representation of ordinal relations in 4- and 12-month-old infants. Poster presented at the Budapest Central European Conference on Cognitive Development, Budapest, Hungary.

Macchi Cassia, V., Gariboldi, V., Bulf, H., McCrink, K. & de Hevia, M.D. (2014). Operational momentum during magnitude ordering in 12-month-old infants. Poster presented at the International Conference on Infant Studies, Berlin, Germany.

McCrink, K. & Galamba, J.* (2013). Spatial-Numerical associations and motor memory in young children. Poster presented at the Cognitive Development Society, Memphis TN.

McCrink, K. & Barth, H. (2013). Non-symbolic multiplication, division, and inversion in young children. Poster presented at the Society for Research in Child Development, Seattle WA.

Shih, A., Berkowitz, T., McCrink, K. & Shaki, S. (2011). Spatial Biases for Learning Ordinal Stimuli in American and Israeli Preschoolers. Poster presented at the Society for Research in Child Development, Montreal, Canada.

McCrink, K. & Spelke, E. (2009) Non-symbolic multiplication by 5-7-year-old children. Poster presented at the Society for Research in Child Development biennial conference, Denver, CO.

McCrink, K. & Wynn, K (2007) Operational momentum: An interaction of number and space in young infants. Poster presented at SRCD, Boston, MA.

McCrink, K. & Wynn, K. (2005b) Large-Number Addition and Subtraction by 9-Month-Old Infants: Distant and Close Discrimination Comparisons. Poster presented at SRCD, Atlanta, GA.

McCrink, K. & Wynn, K. (2004) Ratio abstraction by six-month-old infants. Poster presented at ICIS Chicago, IL.

McCrink, K. & Wynn, K. (2004) Large-number addition and subtraction in 9-month-old infants. Poster presented at ICIS Chicago, IL.

McCrink, K. & Aslin, R. (2002) Infant attention to synchrony in a complex visual scene. Poster presented at ICIS Toronto, Canada.

McCrink, K. & Walker-Andrews, A. (2000) Examining the role of emotion in word learning. Poster presented at ICIS Brighton, England.

McCrink, K. & Walker-Andrews, A. (2000) The role of pitch in infants' intermodal matching of facial and vocal expressions. Poster presented at ICIS, Brighton, England.

I. Works in Progress or Submitted for Publication

Dunn, H.*, Bernstein, N.*, Macchi Cassia, V., Bulf, H., de Hevia, M.D., & McCrink, K. (submitted). Operational momentum in children and adults: Ordering along the number line.

J. Grant Activity

Prior Awards Now Terminated:

Graduate Research Fellowship (2004 - 2007)
National Science Foundation
~\$75,000

NIH/NICHD R15 HD065629-01 McCrink (PI) 6/1/10-6/1/13
Intuitive Mathematical Operations in Infancy and Childhood
\$426,690

NIH/NICHD 1R15 HD077518-01A1 McCrink (PI) 5/1/14 - 5/1/17, NCE 5/2/17-3/30/18
The Interface of Learning and Spatial-Numerical Skills
\$415,616

Active Grants:

NIH/NICHD 1R15HD096363-01 McCrink (PI) 9/12/18-9/12/21
Early Development of Spatial-Numerical Associations
\$421,791

K. Service to the College

- Institutional Review Board (2014-present); Barnard College
- Search committee for Clinical Lecturer hire (Fall-Spring 2017-2018); Barnard Psychology Department
- Search committee for Developmental term hire (Spring 2017); Barnard Psychology Department
- Search committee for Clinical Psychology hire (Fall 2016); Barnard Psychology Department
- Subcommittee on Methods course development (2015-2016); Barnard Psychology Department
- Statistics Goals Assessment Committee (2103-2014); Barnard Psychology Department
- Major Goals Assessment Committee (2011-2012); Barnard Psychology Department
- Colloquium Committee (2011-2012); Columbia/Barnard Psychology Department

L. Service to the Profession

Consulting Editor: *Journal of Experimental Psychology: General*

Consulting Editor: *Journal of Cognition and Development*

Review Editor: *Frontiers in Cognition*

College of Reviewers: Developmental Sciences program, National Science Foundation (2017-)

Panelist: Cognition-Perception study section for grant review at the National Institutes of Health (2016)

Panelist: Math Cognition study section for grant review at the National Science Foundation (2016)

Ad-hoc Grant reviewer: Israel Science Foundation (2011), National Science Foundation (2014, 2017)

Ad hoc reviewer for *Psychological Science*, *Journal of Experimental Child Psychology*, *JEP: General*, *LMC*, *Trends in Cognitive Science*, *Cognition*, *Infancy*, *Journal of Cross-Cultural Psychology*, *Developmental Psychology*, *Child Development*, *Attention Perception & Psychophysics*, *Quarterly Journal of Experimental Psychology*, *Journal of Comparative Psychology*, *Behavioral and Brain Sciences*, *Developmental Science*, *Acta Psychologica*, *Journal of Cognition and Development*, *PLoS One*, *Cognitive Development*, *Journal of Numerical Cognition*, *Psychonomic Bulletin & Review*; *Proceedings of the National Academy of Sciences*, *Current Biology*

Conference reviewer: Society for Research in Child Development, Cognitive Development Society, International Conference on Infant Studies

M. Professional Community Service

Advisory panel for the WAKids K-2 At-home Enrichment Survey (2016)

Expert at the Ask the Expert parenting series for the Children's Museum of Manhattan (2013)

Educator Development at the Brooklyn Children's Museum, CMoM (2015-)