

Richard Prather

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College of Education

Human Development and Quantitative Methodology

PERSONAL INFORMATION

Educational Background

- Ph.D., Psychology, University of Wisconsin -Madison, 2009
- BS., Brain and Cognitive Sciences, Massachusetts Institute of Technology, 2002

Academic Appointments at UMD

- 8-23-2014 - present

Other Employment

- Postdoctoral Researcher, Indiana University, 6-01-2009 – 7-01-2014

RESEARCH, SCHOLARLY AND CREATIVE ACTIVITIES

Articles in Refereed Journals

Refereed Articles

- *^Prather, R.W., 2014, "Neural Coding Variation Mediates Precision in Numerical Discrimination", *Cognition*, 133, 601 – 610
- Mix, K., Prather, R.W., Smith, L.B., Stockton, J.D., 2014, "Young Children's Interpretation of Multi-Digit Number Names: From Emerging Competence to Mastery", *Child Development*, 85(3), 1306-1319
- *^Prather, R.W., 2012, "Connecting neural coding to number cognition: A computational account", *Developmental Science*, 15(4), 589-600
- *^Prather, R.W., 2012, "Implicit learning of arithmetic regularities is facilitated by proximal contrast", *PLoS ONE*, 2012, 7(10): e48868
- Hattikudur, S., Prather, R.W., Asquith, P., Knuth, E., Nathan, M. J., & Alibali, M. W., 2012, "Constructing graphical representations: Middle schoolers' developing knowledge about slope and intercept", *School Science and Mathematics*, 112(4), 230-240
- *^Prather, R.W. & Alibali, M.W., 2011, "Children's acquisition of arithmetic principles: The role of experience", *Journal of Cognition and Development*, 2(3), 332-354

- *^Prather, R. W. & Alibali, M. W., 2009, "Development of arithmetic principle knowledge: How do we know what learners know?", *Developmental Review*, 29(4), 221-248. [Review]
- *^Prather, R. W. & Alibali, M. W., 2008, "Understanding and using principles of arithmetic: Operations involving negative numbers", *Cognitive Science*, 32(2), 445-457

Published Conference Proceedings

Refereed Conference Proceedings

- ^Prather, R.W., Change in Stimuli Encoding Facilitates Principle Acquisition, Proceedings of the Annual Conference of the Cognitive Science Society, Mahwah, NJ: Erlbaum
- Street, S., Prather, R.W., Stitzel, C., Smith, L.B., Mix, K., Preschoolers' Writing of Multidigit Numbers: From an Additive to a Multiplicative Representational System?, Proceedings of the Annual Conference of the Cognitive Science Society, Mahwah, NJ: Erlbaum
- ^Prather, R. W. & Alibali, M. W., Implicit learning of arithmetic principles, Proceedings of the 7th IEEE International Conference on Development and Learning, In J.McClelland & J. Weng (Eds.)
- ^Prather, R. W., Implicit learning of arithmetic principles, Proceedings of the Twenty-Ninth Annual Conference of the Cognitive Science Society, 2007, In D. Macnamara & G. Trafton (Eds.), (p. 1839). Mahwah, NJ: Erlbaum
- ^Prather, R. W. & Alibali, M. W., Principles of arithmetic with positive and negative numbers, Proceedings of the Twenty-Sixth Annual Conference of the Cognitive Science Society, In K. Forbus, D. Gentner & T. Regier (Eds.), (p. 1620). Mahwah, NJ: Erlbaum
- Prather, R. W. & Boroditsky, L., Left of zero: Representations of negative numbers on the mental number line, Proceedings of the Twenty-Fifth Annual Conference of the Cognitive Science Society, In R. Alterman & D. Kirsch (Eds.), (p. 1394). Mahwah, NJ: Erlbaum
- Davachi, L., Prather, R., & Wagner, A. D., Integration cost: Fractionating configural representations in working memory, Abstracts of the Cognitive Neuroscience Society Meeting, 2002, 9, 62

Conferences, Workshops and Talks

Keynotes

- Ready at Five Research Symposium, Keynote Speaker May 2014

Invited Talks

- University of Richmond, Department of Psychology December, 2013
- University of Buffalo, Department of Psychology December, 2013
- University of Maryland, Department of Human Development November, 2013

- University of Tennessee, Department of Psychology September, 2013
- University of Illinois, School of Education December, 2012
- Tufts University, Department of Psychology December, 2012
- University of Pittsburgh, Learning Research & Development Center January, 2012
- Indiana University, Psychology Department October, 2008
- University of Chicago, Psychology Department April, 2008
- Northwestern University, Psychology Department May, 2008

Refereed Presentations

- Prather, R.W., Neural coding variation mediates precision of number discrimination, Society for Neuroscience Conference. Development of Numerical Cognition Nanosymposium
- Prather, R.W., Learning numbers without numbers: Transfer of learning across magnitude domains, Society for Neuroscience Conference. Development of Numerical Cognition Nanosymposium
- Prather, R.W., Further connecting neural coding to number cognition, Society for Neuroscience Conference. Neural Bases of Human Cognition and Attention Nanosymposium

Refereed Posters

- R W Prather, Predicting Behavior on Mathema'cal Tasks via Computational Models, Society for Research in Child Development

Non-Refereed Posters

- Prather, R.W., The influence of neural coding on numerical cognition, the Society for Cognitive Neuroscience, Poster presented
- Prather, R. W., Stitzel, C., Byrge, L., Street, S., Boyer, T., Smith, L.B., Counting and estimating: Developmental relations between magnitude estimation and counting skill, Cognitive Development Society Conference 2011, Poster presented
- Mix, K., Prather, RW, Stitzel, C., Smith, L., Place-Value Concepts and Multidigit Calculation: Effects of Concrete Models, the Institute of Education Sciences Research Conference, Poster presented
- Prather, R.W. & Alibali, M.W., Children's Acquisition of Arithmetic Principles, the Biennial Meeting of the Society for Research in Child Development, Presented, Denver, Colorado
- Alibali, M.W., Prather, R.W., McNeil, N.M., Are Abstract or Concrete Materials Most Beneficial for Learning? It Depends on Problem Difficulty and Learners Skills, the Biennial Meeting of the Society for Research in Child Development, Paper presented, Denver, Colorado
- Prather, R.W. & Alibali, M.W., Knowledge and acquisition of arithmetic principles, the Institute of Education Sciences Research Conference, Poster presented, Washington, DC

- Prather, R.W. & Alibali, M.W., Children's arithmetic principle knowledge: How do we know what they know?, the Biennial Meeting of the Cognitive Development Society, Poster presented, Santa Fe, NM
- Prather, R. W. & Alibali, M. W., Knowledge of an arithmetic principle in symbolic and verbal contexts: Do children know what adults know?, the Biennial Meeting of the Society for Research in Child Development, Poster presented, Boston, Massachusetts
- Alibali, M. W. & Prather, R. W., Improvements in problem encoding lead to changes in strategy evaluations, the Biennial Meeting of the Society for Research in Child Development, Poster presented, Boston, Massachusetts
- Hattikudur, S., Prather, R. W., Asquith, P., Knuth, E., Nathan, M. J., & Alibali, M. W., Graphing slope and intercept in middle school, the Biennial Meeting of the Society for Research in Child Development, Poster presented, Boston, Massachusetts
- Hattikudur, S., Prather, R. W., Asquith, P., Knuth, E., Nathan, M. J., & Alibali, M. W., Constructing graphical representations: Exploring middle schoolers' intuitions and developing knowledge about slope and intercept, the Annual Meeting of the American Educational Research Association, Poster presented, Chicago, Illinois

Workshops

- R W Prather, Mathematical models as a tool for bringing together biology and behavior, Winter Storm

Sponsored Research

- SPARC Award, University of Maryland, PI

Fellowships, Gifts and Other Funded Research

Fellowships

- Interdisciplinary Training Program Predoctoral Fellowship, University of Wisconsin, 2007 - 2009, (#R305C050055), Institute of Education Sciences, Department of Education
- Minority Fellowship Program Predoctoral Fellowship, American Psychological Association, 2002 - 2005

Submissions and Works in Progress

Manuscripts in Preparation

- Prather, R.W., Contributions of neural coding to the relationship between children's symbolic and non-symbolic number skill

TEACHING, MENTORING AND ADVISING

Courses Taught

- Cognitive Psychology, Spring, 2013, (Undergraduate, 100 students)
- Cognitive Psychology, Fall, 2012, (Undergraduate, 100 students)
- EDHD 721, Cognitive Development, Fall, 2014, (Graduate, 9 students)

Advising: Research or Clinical

Undergraduate

- Shae Fournier, 2012 – 2014 (Indiana University)
- Brittane Foy, 2011 – 2013 (Indiana University)
- Issabelle Oh, 2011 - 2013(Indiana University)

Doctoral

- Sara Heverly-Fitt, 2014 (Graduate Assistantship)

SERVICE AND OUTREACH

Editorships, Editorial Boards and Reviewing Activities

Reviewing Activities for Journals and Presses

- Reviewer, Developmental Psychology, Cognition, Journal of Cognition and Development, Journal of Experimental Child Psychology, Frontiers in Developmental Psychology, School Science and Mathematics

Reviewing Activities for Conferences

- Reviewer, Cognitive Science Society

Committees, Professional & Campus Service

Campus Service - Department

- Graduate Admissions Committee, 2014
- Interim ATP Guidelines Committee, 2014

Media Contributions

Print Media

- Kids may be ready for math earlier than you think, new research suggests, The Washington Post, December 17, 2013

Blogs

- Scientific American Blog Network, The Scicurious Brain, <http://blogs.scientificamerican.com/scicurious-brain/2011/11/16/sfn-neuroblogging-modeling-ideas-ofnumber/>

AWARDS, HONORS AND RECOGNITION

Research Fellowships, Prizes and Awards

- Developmental Science Early Career Research Prize, Developmental Science