

Nicole M. McNeil

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Email: nmcneil@nd.edu, Web: <http://cladlab.nd.edu>**EDUCATION**

- 2005-2006 Postdoctoral Research Associate in Psychology
Yale University
- 2005 Ph.D. in Psychology, Distributed Minor in Statistics and Computer Sciences
University of Wisconsin-Madison
- 1999 B.S. in Psychology, Minor in Chemistry
Carnegie Mellon University

ACADEMIC POSITIONS

- 2017- Professor of Psychology and ACE College Professor, University of Notre Dame
- 2012- Director, Education, Schooling, and Society (ESS), University of Notre Dame
- 2006- Director, Cognition, Learning, and Development (CLAD) Lab at Notre Dame
- 2006- Faculty Fellow, Institute for Educational Initiatives
- 2013- Faculty Affiliate, Wilson Sheehan Lab for Economic Opportunities
- 2012-2017 ACE Associate Professor of Psychology (tenured), University of Notre Dame
- 2010-2012 Mary Hesburgh Flaherty & James Flaherty Assistant Professor of Psychology, Notre Dame
- 2006-2010 Assistant Professor, Department of Psychology, University of Notre Dame
- 2005-2006 Project Director, PACE Center, Yale University
- 2003-2005 Project Assistant, Wisconsin Center for Education Research, University of Wisconsin
- 1999-2003 Research Assistant, Department of Psychology, University of Wisconsin
- 1999 Research Assistant, Department of Psychology, Carnegie Mellon University
- 1998 Undergraduate Intern, Western Psychiatric Institute and Clinic, Pittsburgh, PA

SELECTED HONORS, AWARDS, SCHOLARSHIPS, AND FELLOWSHIPS

- 2018 Elected Fellow of the Association for Psychological Science (APS)
- 2017-2018 Invited participant in ND-LEAD, Notre Dame's leadership development program
- 2016 Christ the Teacher Award, ACE M.Ed. Program, University of Notre Dame
- 2013 Boyd McCandless Award, American Psychological Association
- 2011 National Science Foundation CAREER Award
- 2007 Presidential Early Career Award for Scientists and Engineers (PECASE)
- 2004-2005 American Psychological Association (APA) Dissertation Award [\$3000]
- 2003-2004 American Psychological Foundation E. M. Koppitz Graduate Travel Stipend [\$4000]
- 2001-2002 Marian Schwartz Fellowship in Experimental Psychology, University of Wisconsin
- 1999-2000 Henry Vilas Graduate Fellowship, University of Wisconsin
- 1999 Phi Beta Kappa Honors Society, Upsilon of Pennsylvania
- 1999 Phi Kappa Phi Honors Society, Carnegie Mellon Chapter
- 1999 Phi Kappa Phi Research Award, First Place, Carnegie Mellon [\$250]
- 1997-1999 Alumni Memorial Scholarship, Carnegie Mellon University
- 1998 Sigma Xi Research Award, First Place, Carnegie Mellon [\$500]
- 1997-1998 National Institute of Mental Health (NIMH) Undergraduate Fellowship

GRANTS AND SPONSORED PROGRAMS

- 2020-2024 National Science Foundation, SBE, BCS-2017280 (role: co-PI, with Susan Goldin-Meadow, PI; Breckie Church, co-PI; Fey Parrill, co-PI; David Simkins, co-PI; Ryan Lepic, co-PI) “Using gesture to augment web-based mathematics instruction for children and adults.” [\$723,113]
- 2018-2023 National Science Foundation, CAREER, DRL-1749294 (role: Consultant/Advisory Board) “Mechanisms underlying the relation between mathematical language and mathematical knowledge.” (PI: Purpura, Purdue University)
- 2017-2021 National Science Foundation, EHR Core Research, DRL-1661086 (role: PI) “Improving children’s ability to connect counting to cardinality through shared book reading.” [\$736,033]
- 2015-2019 Institute of Education Sciences, U.S. Department of Education, R305A150088 (role: co-PI, with WestEd colleagues, Jodi Davenport, PI, Yvonne Kao, co-PI, and Steve Schneider, co-PI) “Improving children’s understanding of mathematical equivalence: An efficacy study” [\$3.49 million]
- 2015-2020 National Science Foundation, CAREER, DRL-1452000 (role: Consultant/Advisory Board) “Spatial foundations of symbolic numeracy skills in young children.” (PI: Gunderson, Temple University)
- 2015-2016 University of Notre Dame, Office of Research, Faculty Research Support Program (FRSP) Initiation Grant (role: PI) “Comparison of three early math interventions.” [\$10,000]
- 2014-2017 National Science Foundation, REAL, #1420249 & 1420196 (role: Consultant/Advisory Board) “Collaborative Research: Language structure and number word learning.” (co-PIs: Barner, University of California-San Diego and Shusterman, Wesleyan)
- 2011-2017 National Science Foundation, CAREER, DRL-1054467 (role: PI) “Predictors and consequences of early understanding of mathematical equivalence.” [\$749,830]
- 2011-2015 Institute of Education Sciences, U.S. Department of Education, R305A110198 (role: PI) “Improving children’s understanding of mathematical equivalence.” [\$565,456]
- 2009-2012 National Science Foundation, REESE, #0910218 (role: Consultant/Advisory Board) “Transfer for perceptually grounded principles.” (PI: Goldstone, Indiana University)
- 2007-2012 Institute of Education Sciences, U.S. Department of Education, R305B070297 (role: PI) “Arithmetic practice that promotes conceptual understanding and computational fluency.” [\$761,425]
- 2002-2004 Graduate Student Research Grants, University of Wisconsin [4 totaling \$1700]
- 1997-1999 Small Undergraduate Research Grants, Carnegie Mellon [3 totaling \$1200]

BOOKS, MONOGRAPHS, AND BOOK CHAPTERS

- McNeil**, N. M., ^GHornburg, C. B., Fuhs, M. W., & ^GO'Rear, C. (2017). Understanding children's difficulties with mathematical equivalence. In D. C. Geary, D. B. Berch, & K. Mann Koepke (Eds). *Mathematical Cognition and Learning, Volume 3*, San Diego, CA: Elsevier Academic Press.
- Knuth, E. J., Alibali, M. W., **McNeil**, N. M., Weinberg, A., & Stephens, A. C. (2011). Middle school students' understanding of core algebraic concepts: Equivalence and variable. In J. Cai & E. Knuth (Eds.), *Early Algebraization: A Global Dialogue from Multiple Perspectives* (pp. 259-275). New York, NY: Springer.

REFEREED JOURNAL ARTICLES

^P indicates postdoc author; ^G indicates graduate student author; ^U indicates undergraduate student author; ^R indicates research assistant author; ^F indicates former student, postdoc, or research assistant author

- ^GKirkland, P.K. & **McNeil**, N. M. (accepted for publication). Question design affects students' sense-making on mathematics word problems. *Cognitive Science*.
- ^FHornburg, C. B., Brletic-Shipley, H., Matthews, J. M., & **McNeil**, N. M. (in press). Improving children's understanding of mathematical equivalence. *Mathematics Teacher: Learning & Teaching PK-12*, 114.
- ^GO'Rear, C. D., ^GKirkland, P. K., & **McNeil**, N. M. (2020). Partial knowledge in the development of number word understanding. *Developmental Science*, 25(5), e12944.
- Davoli, C., ^GO'Rear, C., Ehrman, E., & **McNeil**, N. M., & Brockmole, J. (2020). Hand placement affects performance on multiplication tasks. *Journal of Numerical Cognition*, 6, 1-21.
- ^UGaylord, S., ^GO'Rear, C. D., ^GHornburg, C. B., & **McNeil**, N. M. (2020). Preferences for tactile and narrative counting books across parents with different education levels. *Early Childhood Research Quarterly*, 50(3), 29-39.
- ^GO'Rear, C. D. & **McNeil**, N. M. (2019). Improved set-size labeling mediates the effect of a counting intervention on children's understanding of cardinality. *Developmental Science*, 22(6), e12819.
- McNeil**, N. M., ^GHornburg, C. B., Brletic-Shipley, H., & ^FMatthews, J. M. (2019). Improving children's understanding of mathematical equivalence via an intervention that goes beyond nontraditional arithmetic practice. *Journal of Educational Psychology*, 111, 1023-1044.
- McNeil**, N. M., ^GHornburg, C. B., ^RDevlin, B. L., ^FCarrazza, C., & ^FMcKeever, M. O. (2019). Consequences of individual differences in children's formal understanding of mathematical equivalence. *Child Development*, 90, 840-956.
- ^GHornburg, C. B., Wang, L. & **McNeil**, N. M. (2018). Comparing meta-analysis and individual person data analysis using raw data on children's understanding of equivalence. *Child Development*, 89, 1983-1995.

- ^FChesney, D. L., **McNeil**, N. M., ^FPetersen, L. A., & ^FDunwiddie, A. E. (2018). Arithmetic practice that includes relational words promotes conceptual understanding and computational fluency. *Learning and Individual Differences, 64*, 104-112.
- Alibali, M. W., ^FCrooks, N. M., & **McNeil**, N. M. (2018). Perceptual support promotes strategy generation: Evidence from equation solving. *British Journal of Developmental Psychology, 36*, 153-168.
- ^FFyfe, E. R., ^FMatthews, P. G., Amsel, E., McEldoon, K. L., & **McNeil**, N. M. (2018). Assessing formal knowledge of math equivalence among algebra and pre-algebra students. *Journal of Educational Psychology, 110*, 87-101.
- ^GHornburg, C. B., ^URieber, M., & **McNeil**, N. M. (2017). An integrative data analysis of gender differences in children's understanding of mathematical equivalence. *Journal of Experimental Child Psychology, 63*, 140-150.
- ^FFuhs, M. W., ^GHornburg, C. B., & **McNeil**, N. M. (2016). Specific number sense skills mediate the association between inhibitory control and mathematics achievement. *Developmental Psychology, 52*, 1217-1235.
- ^FFuhs, M. W., **McNeil**, N. M., Kelley, K., Villano, M., & ^GO'Rear, C. (2016). The role of non-numerical stimulus features in approximate number system training in preschoolers from low-income homes. *Journal of Cognition and Development, 17*.
- Alcock, L., Ansari, D., Batchelor, S., Bisson, M., De Smedt, B., Gilmore, C., Gobel, S., Hannula-Sormunen, M., Hodgen, J., Inglis, M., Jones, I., Mazzocco, M., **McNeil**, N. M., Schneider, M., Simms, V., & Weber, K. (2016). Challenges in mathematical cognition: A collaboratively-derived research agenda. *Journal of Numerical Cognition, 2*, 20-41.
- McNeil**, N. M., ^FFyfe, E. R., & ^FDunwiddie, A. E. (2015). Arithmetic practice can be modified to promote understanding of math equivalence. *Journal of Educational Psychology, 107*, 423-436.
- ^FFyfe, E. R., **McNeil**, N. M., & Rittle-Johnson, B. (2015). Easy as ABCABC: Abstract language facilitates performance on a concrete patterning task. *Child Development, 86*, 927-935.
- ^GByrd, C. E., **McNeil**, N. M., ^PChesney, D. L., & ^PMatthews, P. G. (2015). A specific misconception of the equal sign acts as a barrier to children's learning of early algebra. *Learning and Individual Differences, 38*, 61-67.
- ^UFyfe, E. R., **McNeil**, N. M., & ^UBorjas, S. (2015). Benefits of "concreteness fading" for children's mathematics understanding. *Learning and Instruction, 35*, 104-120.
- ^PChesney, D. L. & **McNeil**, N. M. (2014). Activation of operational thinking during arithmetic practice hinders learning and transfer. *Journal of Problem Solving, 7*, 24-35.

- ^PChesney, D. L., **McNeil**, N. M., ^PMatthews, P. G., ^GByrd, C. E., ^GPetersen, L. A., ^UWheeler, M. C., ^UFyfe, E. R., & ^FDunwiddie, A. E. (2014). Organization matters: Individual differences in children's mental organization of addition knowledge correlate with understanding of math equivalence in symbolic form. *Cognitive Development*, *30*, 30-46.
- McNeil**, N. M. (2014). A "change-resistance" account of children's difficulties understanding mathematical equivalence. *Child Development Perspectives*, *8*, 42-47.
- ^UFyfe, E. R., **McNeil**, N. M., Son, J. Y., & Goldstone, R. L. (2014). Concreteness fading in mathematics and science instruction: A systematic review. *Educational Psychology Review*, *26*, 9-25.
- ^PChesney, D. L., **McNeil**, N. M., Brockmole, J. R., & Kelley, K. (2013). An eye for relations: Eye-tracking indicates long-term negative effects of operational thinking on understanding of math equivalence. *Memory & Cognition*, *41*, 1079-1095.
- ^GPetersen, L. A., & **McNeil**, N. M. (2013). Using perceptually rich objects to help children represent number: Established knowledge counts. *Child Development*, *84*, 1020-1033.
- ^GFuhs, M. W., & **McNeil**, N. M. (2013). ANS acuity and mathematics ability in preschoolers from low-income homes: Contributions of inhibitory control. *Developmental Science*, *16*, 136-48.
- McNeil**, N. M., ^PChesney, D. L., ^PMatthews, P. G., ^UFyfe, E. R., ^GPetersen, L. A., & ^RDunwiddie, A. E. (2012). It pays to be organized: Organizing addition knowledge around equivalent values facilitates understanding of mathematical equivalence. *Journal of Educational Psychology*, *104*, 1109-1121.
- McNeil**, N. M., & ^UFyfe, E. R. (2012). "Concreteness fading" promotes transfer of mathematical knowledge. *Learning and Instruction*, *22*, 440-448.
- McNeil**, N. M., ^UFyfe, E. R., ^GPetersen, L. A., ^RDunwiddie, A. E., & Brletic-Shipley, H. (2011). Benefits of practicing $4 = 2 + 2$: Nontraditional problem formats facilitate children's understanding of mathematical equivalence. *Child Development*, *82*, 1620-1633.
- McNeil**, N. M., ^GFuhs, M. W., ^GKeultjes, M. C., ^UGibson, M. H. (2011). Influences of problem format and SES on preschoolers' understanding of approximate addition. *Cognitive Development*, *26*, 57-71.
- McNeil**, N. M., Rittle-Johnson, B., Hattikudur, S., & ^GPetersen, L. A. (2010). Continuity in representation between children and adults: Arithmetic knowledge hinders undergraduates' algebraic problem solving. *Journal of Cognition and Development*, *11*, 437-457.
- McNeil**, N. M., Weinberg, A., Stephens, A. C., Hattikudur, S., Asquith, P., Knuth, E. J., & Alibali, M. W. (2010). A is for apple: Mnemonic symbols hinder students' interpretation of algebraic expressions. *Journal of Educational Psychology*, *102*, 625-634.
- McNeil**, N. M., & Uttal, D. H. (2009). Rethinking the use of concrete materials in learning: Perspectives from development and education. *Child Development Perspectives*, *3*, 137-139.

¹Brown, M. C., ¹McNeil, N. M., & Glenberg, A. M. (2009). Using concreteness in education: Real problems, potential solutions. *Child Development Perspectives*, 3, 160-164.

¹contributed equally, so listed alphabetically

Haefffel, G. J., Thiessen, E. D., Campbell, M. W., Kaschak, M. P., & McNeil, N. M. (2009). Theory, not cultural context, will advance psychology. *American Psychologist*, 64, 570-571.

McNeil, N. M., Uttal, D. H., Jarvin, L., & Sternberg, R. J. (2009). Should you show me the money? Concrete objects both hurt and help performance on mathematics problems. *Learning and Instruction*, 19, 171-184.

McNeil, N. M. (2008). Limitations to teaching children $2 + 2 = 4$: Typical arithmetic problems can hinder learning of mathematical equivalence. *Child Development*, 79, 1524-1537.

Knuth, E. J., Alibali, M. W., Hattikudur, S., McNeil, N. M., & Stephens, A. C. (2008). The importance of equal sign understanding in the middle grades. *Mathematics Teaching in the Middle School*, 13, 514-520.

McNeil, N. M. & Jarvin, L. (2007). When theories don't add up: Disentangling the manipulatives debate. *Theory Into Practice*, 46, 309-316.

McNeil, N. M. (2007). U-shaped development in math: Seven year olds outperform nine year olds on mathematical equivalence problems. *Developmental Psychology*, 43, 687-695.

Alibali, M. W., Knuth, E. J., Hattikudur, S., McNeil, N. M., & Stephens, A. C. (2007). A longitudinal examination of middle school students' understanding of the equal sign and performance solving equivalent equations. *Mathematics Thinking and Learning*, 9, 221-247.

McNeil, N. M., Grandau, L., Knuth, E. J., Alibali, M. W., Stephens, A. S., Hattikudur, S., & Krill, D. E. (2006). Middle-school students' understanding of the equal sign: The books they read can't help. *Cognition and Instruction*, 24, 367-385.

Knuth, E. J., Stephens, A. C., McNeil, N. M. & Alibali, M. W. (2006). Does understanding the equal sign matter? Evidence from solving equations. *Journal for Research in Mathematics Education*, 37, 297-312.

McNeil, N. M., & Alibali, M. W. (2005b). Why won't you change your mind? Knowledge of operational patterns hinders learning and performance on equations. *Child Development*, 76, 883-899.

McNeil, N. M., & Alibali, M. W. (2005a). Knowledge change as a function of mathematics experience: All contexts are not created equal. *Journal of Cognition and Development*, 6, 385-206.

Knuth, E. J., Alibali, M. W., McNeil, N. M., Weinberg, A., Stephens, A. C. (2005). Middle school students' understanding of core algebraic concepts: Equality and variable. *Zentralblatt für Didaktik der Mathematik / International Reviews on Mathematical Education*, 37, 68-76.

McNeil, N. M., & Alibali, M. W. (2004). You'll see what you mean: Students encode equations based on their knowledge of arithmetic. *Cognitive Science*, 28, 451-466.

Evans, J. L., Alibali, M. W., & **McNeil**, N. M. (2001). Divergence of verbal expression and embodied knowledge: Evidence from speech and gesture in children with Specific Language Impairments. *Language and Cognitive Processes*, 16, 309-331.

McNeil, N. M., & Alibali, M. W. (2000). Learning mathematics from procedural instruction: Goals influence learning from the outside in. *Journal of Educational Psychology*, 92, 734-744.

McNeil, N. M., Alibali, M. W., & Evans, J. L. (2000). Role of gesture in children's language comprehension: Now they need it, now they don't. *Journal of Nonverbal Behavior*, 24, 131-150.

REFEREED PUBLICATIONS IN PROCEEDINGS

^FSilla, E. M., ^FHornburg, C. B., Kloser, M., & **McNeil**, N. M. (2020) Research-based teaching practices for improving students' understanding of mathematical equivalence have not made it into elementary classrooms. In S. Denison, M. Mack, Y. Xu, & B. Armstrong (Eds.), *Proceedings of the 42nd Annual Conference of the Cognitive Science Society* (pp. 2937-2943). Austin, TX: Cognitive Science Society.

^GO'Rear, C. D., **McNeil**, N. M., & ^GKirkland, P. (2018) Evidence of partial number word knowledge on The give-*n* task. In C. Kalish, M. Rau, J. Zhu, & T. T. Rogers (Eds.), *Proceedings of the 40th Annual Conference of the Cognitive Science Society* (pp. 834-839). Austin, TX: Cognitive Science Society.

Johannes, K., Davenport, J., Kao, Y., ^GHornburg, C. B. & **McNeil**, N. M. (2017). Promoting children's relational understanding of equivalence. In G. Gunzelmann, A. Howes, T. Tenbrink, & E. Davelaar (Eds.), *Proceedings of the 39th Annual Conference of the Cognitive Science Society* (pp. 600-605). Austin, TX: Cognitive Science Society.

^GByrd, C. E., **McNeil**, N. M., D'Mello, S. K., & Cook, S. W. (2014). Gesturing may not always make learning last. In P. Bello, M. Guarini, M. McShane, & B. Scassellati (Eds.), *Proceedings of the 36th Annual Conference of the Cognitive Science Society* (pp. 1982-1987). Austin, TX: Cognitive Science Society.

^FMatthews, P. G., ^FChesney, D. L., & **McNeil**, N. M. (2014). Are fractions natural numbers, too? In P. Bello, M. Guarini, M. McShane, & B. Scassellati (Eds.), *Proceedings of the 36th Annual Conference of the Cognitive Science Society* (pp. 982-987). Austin, TX: Cognitive Science Society.

^GPetersen, L. A., **McNeil**, N. M., ^UTollaksen, A. K., ^UBoehm, A. G., ^UHall, C. J., ^RCarrazza, C., & ^RDevlin, B. L. (2014). Counting practice with pictures, but not objects, improves children's understanding of cardinality. In P. Bello, M. Guarini, M. McShane, & B. Scassellati (Eds.), *Proceedings of the 36th Annual Conference of the Cognitive Science Society* (pp. 2633-2637). Austin, TX: Cognitive Science Society.

^GPetersen, L. A., ^UHeil, J. K., **McNeil**, N. M., & Haeffel, G. J. (2010). Learning from errors in game-based versus formal mathematics contexts. In S. Ohlsson & R. Catrambone (Eds.), *Proceedings of the 32nd Annual Conference of the Cognitive Science Society* (pp. 2578-2582). Austin, TX: Cognitive Science Society.

^UCrooks, N. M., & **McNeil**, N. M. (2009). Increased practice with “set” problems hinders performance on the water jar task. In N. A. Taatgen & H. van Rijn (Eds.), *Proceedings of the 31st Annual Conference of the Cognitive Science Society* (pp. 643-648). Austin, TX: Cognitive Science Society.

^GKeultjes, M. C., ^UGibson, M. H., & **McNeil**, N. M. (2009). Children’s understanding of approximate arithmetic depends on problem format. In N. A. Taatgen & H. van Rijn (Eds.), *Proceedings of the 31st Annual Conference of the Cognitive Science Society* (pp. 329-334). Austin, TX: Cognitive Science Society.

^GPetersen, L. A., & **McNeil**, N. M. (2008). Using perceptually rich objects to help children represent number: Established knowledge counts. In B. C. Love, K. McRae, & V. M. Sloutsky (Eds.), *Proceedings of the 30th Annual Conference of the Cognitive Science Society* (pp. 1567-1572). Austin, TX: Cognitive Science Society.

McNeil, N. M. (2004a). Don’t teach me $2 + 2 = 4$: Knowledge of arithmetic operations hinders equation learning. In K. D. Forbus, D. Gentner, & R. Regier (Eds.), *Proceedings of the 26th Annual Conference of the Cognitive Science Society* (pp. 938-943). Mahwah, NJ: Lawrence Erlbaum Associates.

McNeil, N. M., Grandau, L., Stephens, A. C., Krill, D. E., Alibali, M. W., & Knuth, E. J. (2004). Middle-school students’ experience with the equal sign: *Saxon Math ≠ Connected Mathematics*. In D. McDougall (Ed.), *Proceedings of the XXVI Annual Conference of the North American Chapter of the International Group for the Psychology of Mathematics Education (PME-NA), Toronto, Canada* (Vol. 1, pp. 271-6). Columbus, OH: ERIC.

McNeil, N. M., & Alibali, M. W. (2002). A well-established schema can interfere with learning: The case of children’s typical addition schema. In C. D. Schunn & W. Gray (Eds.), *Proceedings of the 24th Annual Conference of the Cognitive Science Society* (pp. 661-6). Mahwah, NJ: Lawrence Erlbaum Associates.

McNeil, N. M., & Alibali, M. W. (2001). Gesture production is associated with task motivation. In C. Cavé, I. Guaitella, & S. Santi (Eds.), *Oralité et gestualité: Interactions et comportements multimodaux dans la communication* [Orality and gestuality: Multimodal interaction and behavior in communication]. *Actes du colloque* [Proceedings of the meeting of] *ORAGE 2001* (pp. 247-252) Paris, France: L’Harmattan.

Alibali, M. W., **McNeil**, N. M., & Perrott, M. A. (1998). What makes children change their minds? Changes in encoding lead to changes in strategy selection. In M. A. Gernsbacher & S. Derry (Eds.), *Proceedings of the 20th Annual Conference of the Cognitive Science Society* (pp. 36-41). Mahwah, NJ: Lawrence Erlbaum Associates.

UNREFEREED PUBLICATIONS

Gubbins, E. J., Housand, B., Oliver, M., Schader, R., de Wet C. F., Moon, T. R., Hertberg-Davis, H., Callahan, C. M., Brighton, C., Sternberg, R. J, Grigorenko, E., Jarvin, L., **McNeil**, N. M., Connolly, K. (2008). Unclogging the mathematics pipeline through access to algebraic understanding. Storrs, CT: National Research Center on the Gifted and Talented.

OTHER PUBLICATIONS

McNeil, N. M. (2004b). Test item file to accompany *Children's Thinking* 4th edition by R. S. Siegler & M. W. Alibali. Upper Saddle River, NJ: Prentice Hall.

MANUSCRIPTS UNDER REVIEW OR IN PREPARATION

^GHornburg, C. B., & **McNeil**, N. M. (revise and resubmit). The role of problem format in children's learning of mathematical equivalence. *Cognitive Science*.

^FHornburg, C. B., ^FDevlin, B. L., & **McNeil**, N. M. (revise and resubmit). Grade of acquisition of understanding of mathematical equivalence predicts algebra readiness. *Journal of Educational Psychology*.

^GKirkland, P.K. Cheng, Y., Trinter, C. P., & **McNeil**, N. M. (in preparation). A brief measure to assess students' mature number sense.

^GKirkland, P.K. & **McNeil**, N. M. (in preparation). Fortune can still favor the disfluent: A replication and extension of Diemand-Yauman et al. (2011).

^FDevlin, B. L., ^FHornburg, C. B., & **McNeil**, N. M. (in preparation). Kindergarteners' number sense, relational thinking, and executive functioning skills as predictors of formal understanding of mathematical equivalence.

INVITED LECTURES AND ADDRESSES

- 2019 Andrew's University, Leaders in the Field Lecture Series, Berrien Springs, MI
- 2019 University of Chicago, Role of Gesture in Math Learning Meeting, Chicago, IL
- 2019 Midwestern Psychological Association (discussant for invited symposium), Chicago, IL
- 2018 Kent State University, Department of Psychological Sciences, Kent, OH
- 2018 University of Chicago, Chicago Education Workshop Lecture Series, Chicago, IL
- 2017 Notre Dame Institute for Advanced Study, Notre Dame, IN
- 2016 Illinois State University, School of Teaching & Learning, Normal, IL
- 2015 Math Cognition Conference (sponsored by NICHD), St. Louis, MO
- 2015 Annual Conference on Research in Undergraduate Mathematics Education, Pittsburgh, PA
- 2014 Temple University, Institute for Learning and Education Sciences
- 2014 Grand Challenges in Mathematical Cognition Conference, Royal Society International Center
- 2014 University of Illinois, Department of Psychology, Developmental Brown Bag Series
- 2014 Carnegie Mellon University, Department of Psychology, PIER Speaker Series
- 2013 Wesleyan University, Department of Psychology
- 2013 American Psychological Association Annual Convention, Division 7 Program, Honolulu, HI
- 2012 University of Delaware, School of Education Conference on Improving Teaching and Learning
- 2009 University of Wisconsin-Madison, IES Interdisciplinary Training Program Seminar Series
- 2009 Indiana University, Symposium on Transfer of Learning
- 2009 Indiana University, Dept. of Psychological and Brain Sciences, Cognitive Colloquium Series
- 2009 Institute of Education Sciences, Fourth Annual IES Research Conference
- 2009 Institute of Education Sciences, Meeting of the National Board of Education
- 2008 Institute of Education Sciences, PECASE Colloquium
- 2008 University of Chicago, Department of Psychology, Developmental Seminar Series
- 2008 University of Portland, Symposium on Education
- 2006 Michigan State University, School of Education

2006 University of Notre Dame, Department of Psychology
 2006 University of Oregon, Department of Psychology
 2006 University of Colorado, Institute of Cognitive Science
 2006 Colgate University, Department of Psychology
 2006 Boston College, Lynch School of Education
 2006 Oklahoma State University, Department of Psychology
 2006 University of Miami, Department of Psychology
 2006 Emory University, Department of Psychology
 2006 Florida State University, Department of Psychology
 2006 Wake Forest University, Department of Psychology
 2006 Syracuse University, Department of Psychology
 2006 University of Pittsburgh, Department of Psychology and LRDC
 2006 University of Illinois—Chicago, Department of Psychology
 2005 Yale University, Center for the Psychology of Abilities, Competencies, & Expertise
 2005 Texas Tech University, Human Development & Family Studies
 2005 Indiana University, School of Education
 2005 University of North Carolina—Chapel Hill, School of Education
 2005 University at Buffalo (SUNY), Department of Psychology
 2005 Northwestern University, School of Education and Social Policy
 2005 University of Missouri, Department of Psychology
 2005 Northwestern University, Department of Psychology
 2004 University of Iowa, Department of Psychology

CONFERENCE PRESENTATIONS

- ^FDevlin, B. L., ^FHornburg, C. B., & **McNeil**, N. M. (2020, October). Young children’s mental organization of arithmetic relates to specific number skills and understanding of mathematical equivalence. Poster presented at the Annual Meeting of the Mathematical Cognition and Learning Society (MCLS).
- ^GKirkland, P.K., Cheng, Y., Trinter, C., & **McNeil**, N.M. (2020). Developing a measure of student number sense with valid and reliable scores. Poster was accepted to be presented at the Annual Meeting of the National Council of Teachers of Mathematics (NCTM) Research Conference, Chicago, IL. (Conference cancelled due to covid-19)
- Johannes, K., Kao, Y., Davenport, J., & **McNeil**, N. M. (2020). Understanding how students improve through targeted training in mathematical equivalence. Poster was accepted to be presented at the Annual Meeting of the American Educational Research Association (AERA), San Francisco, CA. (Conference cancelled due to covid-19)
- ^GO’Rear, C. D. & **McNeil**, N. M. (2019, October). U-shaped development of spontaneous counting on tasks designed to assess children’s number word knowledge. Poster presented at the Biennial Meeting of the Cognitive Development Society (CDS), Louisville, KY.

- ^FHornburg, C. B., ^FDevlin, B. L., & **McNeil**, N. M. (2019, April). Grade of acquisition of understanding of mathematical equivalence in elementary school predicts algebra readiness in middle school. In T. Reddick (Organizer), *The Influence of Math Cognition on Academic Outcomes*. Invited Symposium presented at the Midwestern Psychological Association (MPA), Chicago, IL.
- McNeil**, N. M. (2019, April). A discussion of probing students' understanding with differing external representations. In A. Bartell (Organizer), *Probing Students' Understanding with Differing External Representations*. Symposium presented at the American Education Research Association, Toronto, ON.
- ^GO'Rear, C. D., ^FGaylord, S. M., ^FHornburg, C. B., & **McNeil**, N. M. (2019, March). Features that affect parents' preferences for different counting books. Poster presented at the Biennial Meeting of the Society for Research in Child Development (SRCD), Baltimore, MD.
- ^FDevlin, B. L., ^FHornburg, C. B., & **McNeil**, N. M. (2019, March). Grade of acquisition of understanding of mathematical equivalence predicts algebra readiness. Poster presented at the Biennial Meeting of the Society for Research in Child Development (SRCD), Baltimore, MD.
- ^GHornburg, C. B., **McNeil**, N. M., & Wang, L. (2017, November). Problem encoding does not always drive problem solving: Evidence from children's performance on mathematical equivalence problems. Poster presented at the 58th Annual Meeting of the Psychonomics Society, Vancouver, British Columbia, Canada.
- ^GHornburg, C. B., **McNeil**, N. M., & Wang, L. (2017, October). The role of encoding in children's understanding of mathematical equivalence depends on problem format. Poster presented at the Biennial Meeting of the Cognitive Development Society (CDS), Portland, OR.
- McNeil**, N. M., ^GO'Rear, C. D., ^FPetersen, L. A., ^UViegut, A. A., ^UBohnsack, A. E., & ^UBoehm, A. (2017, October). Translating cognitive developmental theory to improve children's understanding of counting. In N. C. Jordan & C. Barbieri (Organizers), *Usable Knowledge for Improving Mathematics Learning: Bridging Research in Cognition and Development with Educational Practice in Diverse Contexts*. Symposium presented at the Biennial Meeting of the Cognitive Development Society (CDS), Portland, OR.
- ^GHornburg, C. B., ^URieber, M. L., & **McNeil**, N. M. (2017, October). An integrative data analysis of gender differences in children's understanding of mathematical equivalence. Poster presented at the Biennial Meeting of the Cognitive Development Society (CDS), Portland, OR.
- ^GO'Rear, C. D., & **McNeil**, N. M. (2017, October). Increases in set labeling performance mediate the effect of counting practice on preschoolers' understanding of cardinality. Poster presented at the Biennial Meeting of the Cognitive Development Society (CDS), Portland, OR.
- ^GO'Rear, C. D., ^UBohnsack, A., & **McNeil**, N. M. (2017, May). Random arrangements are better than canonical patterns for promoting understanding of cardinality. Poster presented at the Annual Meeting of the Mathematical Cognition and Learning Society (MCLS), Nashville, TN.
- ^GHornburg, C. B., **McNeil**, N. M. (2017, May). The role of problem format in children's learning of

mathematical equivalence. Poster presented at the Annual Meeting of the Mathematical Cognition and Learning Society (MCLS), Nashville, TN.

^FCarrazza, C., **McNeil**, N. M., ^FTollaksen, A. K., & ^RDevlin, B. L. (2017, May). Parental adherence to a research-based counting intervention. Poster presented at the Biennial Meeting of the Society for Research in Child Development (SRCD), Austin, TX.

^RDevlin, B. L., ^GHornburg, C. B., **McNeil**, N. M. (2017, May). Kindergarteners' understanding of math language predicts response to a math intervention. Poster presented at the Biennial Meeting of the Society for Research in Child Development (SRCD), Austin, TX.

^GO'Rear, C. D., **McNeil**, N. M., Wang, L. (2017, May). Arithmetic fluency and understanding of math equivalence interact to predict children's use of inversion. Poster presented at the Biennial Meeting of the Society for Research in Child Development (SRCD), Austin, TX.

Davenport, J., Kao, Y. & **McNeil**, N. M. (2016, December). Improving children's understanding of mathematical equivalence: An efficacy study. Poster presented at the Annual PI Meeting of the Institute of Education Sciences. Washington, DC.

^RDevlin, B. L., ^GHornburg, C. E., **McNeil**, N. M., & ^FCarrazza, C. (2016, May). Gender differences in response to supplemental early math interventions. Poster presented at the Annual Meeting of the Association for Psychological Science (APS). Chicago, IL.

^GByrd, C. E., **McNeil**, N. M., ^RDevlin, B. L., & ^FMcKeever, M. O. (2015, October). Proficiency with number sets in kindergarten predicts understanding of math equivalence in second grade. In N. **McNeil** (Chair) "*Math and number.*" Oral paper presented at the Biennial Meeting of the Cognitive Development Society (CDS), Columbus, OH.

^GO'Rear, C. D., ^FFuhs, M. W., **McNeil**, N. M., ^USilla, E. (2015, October). Approximate number system acuity (ANS) training in preschoolers from low-income homes. Poster presented at the Biennial Meeting of the Cognitive Development Society (CDS), Columbus, OH.

^GByrd, C. E., **McNeil**, N. M., ^RCarrazza, C., ^FMatthews, J. M., Brletic-Shiple, H., & ^UCeleste, E. (2015, April). Pilot Test of a Comprehensive Intervention to Improve Children's Understanding of Math Equivalence. In D. Francis (Organizer) and E. Bullock (Chair) "*Explorations in Mathematics in the Elementary Grades.*" Talk presented at the Annual Meeting of the American Education Research Association (AERA), Chicago, IL.

^UFyfe, E. R., **McNeil**, N. M., & Rittle-Johnson, B. (2015, March). The effect of abstract versus concrete labels on children's relational reasoning. Poster presented at the Biennial Meeting of the Society for Research in Child Development (SRCD), Philadelphia, PA.

^FFuhs, M. W., & **McNeil**, N. M. (2015, March). Investigating preschoolers' ANS acuity on conflict trials: Does object type matter? Poster presented at the Biennial Meeting of the Society for Research in Child Development (SRCD), Philadelphia, PA.

^RDevlin, B.L., **McNeil**, N. M., ^RCarrazza, C., ^GByrd., C. E., & ^FMcKeever, M. (2015, March). Early

understanding of math equivalence predicts future math achievement. Poster presented at the Biennial Meeting of the Society for Research in Child Development (SRCD), Philadelphia, PA.

Brockmole, J. R., Davoli, C. C., Ehrman, E. K., & **McNeil**, N. M. (2013, November). Getting a grip on concepts: Hand position affects access to mathematical knowledge. Talk presented at the 54th Annual Meeting of the Psychonomic Society. Toronto, ON, Canada.

^GPetersen, L. A., & **McNeil**, N. M. (2013, October). Counting practice with pictures but not objects improves children's understanding of cardinality. In K. H. Herold (Organizer), *Concrete symbols and instruction: Do they facilitate or hinder learning?* Symposium presented at the Biennial Meeting of the Cognitive Development Society (CDS). Memphis, TN.

^GFuhs, M. W., ^GByrd, C. E., & **McNeil**, N. M. (2013, October). Specific number sense skills mediate the association between inhibitory control and mathematics achievement. Poster presented at the Biennial Meeting of the Cognitive Development Society (CDS). Memphis, TN.

^GByrd, C. E., & **McNeil**, N. M., Brletic-ShIPLEY, H., & ^RMatthews, J. M. (2013, September). Development of a comprehensive intervention to improve children's understanding of math equivalence. Poster presented at the Fall Conference of the Society for Research on Educational Effectiveness (SREE). Washington, DC.

^PChesney, D. L., ^PMatthews, P. G., & **McNeil**, N. M. (2013, May). Fraction format affects adults' performance on magnitude comparison problems. Poster presented at the Annual Meeting of the Association for Psychological Science (APS), Washington, D.C.

^UFyfe, E. R., & **McNeil**, N. M. (2013, May). The benefits of "concreteness fading" generalize across task, age, and prior knowledge level. In K. Mix (Organizer), *Learning from concrete models*. Symposium presented at the Biennial Meeting of the Society for Research in Child Development (SRCD), Seattle, WA.

^PChesney, D. L., **McNeil**, N. M., ^PMatthews, P. G., ^GByrd, C. E., ^GPetersen, L. A., ^UWheeler, M., ^UFyfe, E. R., & ^RDunwiddie, A. E. (2013, May). Organization matters: Children's mental organization of arithmetic knowledge correlates with understanding of math equivalence. Talk presented at the Biennial Meeting of the Society for Research in Child Development (SRCD), Seattle, WA.

^GByrd, C. E., **McNeil**, N. M., ^PChesney, D. L., & ^PMatthews, P. G. (2013, May). Children's "arithmetic-specific" interpretation of the equal sign constitutes risk for poor learning of early algebra. Poster presented at the Biennial Meeting of the Society for Research in Child Development (SRCD), Seattle, WA.

^PChesney, D. L., **McNeil**, N. M., ^GPetersen, L. A., & ^RDunwiddie, A. E. (2012, May). Arithmetic practice that includes relational words promotes conceptual understanding and computational fluency. Poster presented at the Annual Meeting of the Association for Psychological Science (APS). Chicago, IL.

^UWester, L. E., & **McNeil**, N. M. (2011, March). Familiar contexts can promote transfer of children's mathematical knowledge. Poster presented at the Biennial Meeting of the Society for Research in Child Development (SRCD). Montreal, Quebec, Canada.

- ^UCrooks, N. M., Alibali, M. W., & **McNeil**, N. M. (2011, March). Highlighting relevant problem features improves encoding of equivalence problems and leads to the generation of correct strategies. Poster presented at the Biennial Meeting of the Society for Research in Child Development (SRCD), Montreal, Quebec, Canada.
- McNeil**, N. M., ^RDunwiddie, A. E., ^GPetersen, L. A., ^UFyfe, E. R., & Brletic-Shiple, H. (2010, June). Arithmetic practice that promotes conceptual understanding and computational fluency: Year 3. Poster presented at the Annual Research Conference of the Institute of Education Sciences (IES), National Harbor, MD.
- ^UFyfe, E. R., & **McNeil**, N. M. (2009, October). Benefits of “concreteness fading” for children with low knowledge of mathematical equivalence. Poster presented at the Biennial Meeting of the Cognitive Development Society (CDS), San Antonio, TX.
- McNeil**, N. M., ^RDunwiddie, A. E., ^GPetersen, L. A., ^UFyfe, E. R., & Brletic-Shiple, H. (2009, June). Arithmetic practice that promotes conceptual understanding and computational fluency: Year 2. Poster presented at the Annual Research Conference of the Institute of Education Sciences (IES), Washington, DC.
- McNeil**, N. M. (2009, May). Effect of arithmetic practice on mathematical thinking. In C. L. O’Donnell & E. R. Albro (Co-Chairs), *Developing preschool through middle school students’ understandings of fundamental concepts in mathematics*. Symposium presented at the Annual Convention of the Association for Psychological Science, San Francisco, CA.
- McNeil**, N. M. (2009, April). Invited Discussion: Evaluating the role of input in children’s (mis)understanding of mathematical equivalence. In M. M. Capraro (Chair), *An international perspective on sixth graders’ interpretation of the equal sign*. Symposium presented at the Annual Meeting of the American Education Research Association (AERA), San Diego, CA.
- ^GPetersen, L. A., & **McNeil**, N. M. (2009, April). Effect of concrete objects on counting skill: An interaction between perceptual richness and established knowledge. In P. G. Matthews (Organizer), *Unpacking concreteness: Understanding how symbol choice impacts learning and transfer*. Symposium presented at the Biennial Meeting of the Society for Research in Child Development (SRCD), Denver, CO.
- Alibali, M. W., Prather, R. W., & **McNeil**, N. M. (2009, April). Are abstract or concrete materials most beneficial for learning? It depends on problem difficulty and learners’ skills. In M. J. Nathan (Organizer), *The role of concrete examples in learning math: Resolving some paradoxes*. Symposium presented at the Biennial Meeting of the Society for Research in Child Development (SRCD), Denver, CO.
- McNeil**, N. M., ^RDunwiddie, A. E., Brletic-Shiple, H., ^GPetersen, L. A., & ^UGibson, M. H., (2008, June). Arithmetic practice that promotes conceptual understanding and computational fluency. Poster presented at the Annual Research Conference of the Institute of Education Sciences (IES), Washington, DC.
- ^GPetersen, L. A., & **McNeil**, N. M. (2007, October). How do different types of objects affect children’s developing counting skill? Poster presented at the Biennial Meeting of the Cognitive Development Society (CDS), Santa Fe, NM.

- McNeil**, N. M., Jarvin, L., Sternberg, R. J., Uttal, D. H. (2007, March). Trade offs between more and less concrete manipulatives. In D. H. Uttal (Organizer), *Concreteness and cognitive development: New perspectives on a classic developmental issue*. Symposium presented at the Biennial Meeting of the Society for Research in Child Development (SRCD), Boston, MA.
- McNeil**, N. M. (2007, March). Tales of a fourth-grade misconception: U-shaped development in children's performance on mathematical equivalence problems. In J. H. Bisanz & J. L. Sherman (Organizers), *Overcoming misconceptions: Mechanisms of positive change for a common mathematical misunderstanding*. Symposium presented at the Biennial Meeting of the Society for Research in Child Development (SRCD), Boston, MA.
- Jarvin, L., **McNeil**, N. M., & Sternberg, R. J. (2006, June). Understanding students' mathematical competencies: An exploration of the impact of contextualizing math problems. Poster presented at the Institute of Education Sciences (IES) Research Conference, Washington, DC.
- McNeil**, N. M., Weinberg, A., Alibali, M. W., & Knuth, E. J. (2005, April). Children's prior knowledge of letters influences the interpretation of algebraic expressions. Poster presented at the Biennial Meeting of the Society for Research in Child Development (SRCD), Atlanta, GA.
- Weinberg, A., Stephens, A. C., **McNeil**, N. M., Krill, D.E., Knuth, E. J., & Alibali, M. W. (2004, April). Students' initial and developing conceptions of variable. Paper presented at the 2004 meeting of the American Educational Research Association (AERA), San Diego, CA.
- Evans, J. L., Alibali, M. W., Mainela-Arnold, E., **McNeil**, N. M., Ryan, K. E., & Simon, L. C. (2003, June). The role of gesture in comprehension of spoken language in children with E-SLI and ER-SLI. Poster presented at the Symposium for Research on Child Language Disorders (SRCLD), Madison, WI.
- McNeil**, N. M., & Alibali, M. W. (2002, June). A well-established schema can interfere with learning: Evidence from children's mathematical problem solving. Poster presented at the Fourteenth Annual Convention of the American Psychological Society (APS), New Orleans, LA.
- McNeil**, N. M., & Alibali, M. W. (2001, October). Don't be too sure about that: Certainty about an incorrect strategy hinders cognitive change. Poster presented at the Second Biennial Meeting of the Cognitive Development Society, Virginia Beach, VA.
- McNeil**, N. M. (2001, April). Mental sets and flexibility in the development of mathematical skill. Poster presented at the Biennial Meeting of the Society for Research in Child Development (SRCD), Minneapolis, MN.
- McNeil**, N. M., Alibali, M. W., & Evans, J. L. (1998, June). *Cognitive deficits in children with Specific Language Impairments: Do gestures reveal hidden knowledge?* Poster presented at the Symposium for Research on Child Language Disorders (SRCLD), Madison, WI.

MASTER'S THESES DIRECTED

Patrick Kirkland (Passed proposal December 2018). *Developing a measure of student number sense.*

Connor O'Rear (Passed June 2017). *Optimizing input to accelerate children's acquisition of the cardinal word principle.*

Caroline Byrd Hornburg (Passed April 2014). *Gesturing may not always make learning last.*

Lori Petersen (Passed April 2010). *The effects of concrete objects on counting skill: An interaction between perceptual features and established knowledge.*

M. Claire Keultjes (Passed April 2010). *Children's understanding of approximate addition depends on problem format.*

DOCTORAL DISSERTATIONS DIRECTED

Connor O'Rear (Passed proposal October 2019)

Caroline Byrd Hornburg (Passed proposal, December 2015; Successfully defended, April 2017)

Lori Petersen (Passed proposal, February 2012; Successfully defended, Summer 2013).

PROFESSIONAL AFFILIATIONS AND MEMBERSHIPS

American Educational Research Association

Association for Psychological Science

Cognitive Development Society

Cognitive Science Society

Mathematical Cognition and Learning Society

Society for Research in Child Development

OTHER NOTABLE CONTRIBUTIONS

Teaching

Courses Taught or Designed

Topics in Educational Psychology: Learning and Instruction (ACE Teaching Fellows Program), University of Notre Dame, spring semesters 2007-2012, 2014-present

Cognitive Science Goes to School (Undergraduate), University of Notre Dame, 2020

Developmental Psychology and Moral Education in Childhood and Adolescence (ACE Teaching Fellows Program), University of Notre Dame, summers 2007, 2009-2012, 2014-present

Using Research to Help Children Learn (Designed, Undergraduate), University of Notre Dame, 2013

Cognitive Development (Graduate), University of Notre Dame, 2008

Cognitive Development (Undergraduate), University of Notre Dame, 2007, 2008, 2010

Research Methods (Undergraduate), University of Notre Dame, 2006

Undergraduate Student Advising

Chloe Spang (2020-)

Research: How mathematics word problem design affects student thinking

Honors: Senior Thesis

Micaela Maron (2020-)

Research: Understanding of cardinality and attention

Honors: Senior Thesis

Alexa Mogan (2020-)

Research: Understanding of cardinality; optimizing instruction for PK-12 mathematics

Grace Fjermedal (2020-present)

Research: Understanding of cardinality; optimizing instruction for elementary math and literacy

Mitchell Kennedy (2020-present)

Research: Understanding of cardinality; optimizing instruction for elementary math and literacy

Muhammad Mian (2020-present)

Research: Understanding of cardinality; optimizing instruction for elementary math and literacy

Ava Conklin (2019-present)

Research: Understanding of cardinality

Hannah Koch (2019-present)

Research: Understanding of cardinality; optimizing instruction for elementary math

Ellyn Jarrell (2019-present)

Research: Understanding of cardinality; optimizing instruction for elementary math

Alexandra Hicks (2019-present)

Research: Understanding of cardinality

Jisel Gomez (2019-present)

Research: Understanding of cardinality; optimizing instruction for elementary math

Madison Zajas (2019-present)

Research: Understanding of cardinality; optimizing instruction for elementary math

Isabella Seip (2019-present)

Research: Understanding of cardinality; optimizing instruction for elementary math

Amy Bahadursingh (2019-present)

Research: Understanding of cardinality; understanding of mathematical equivalence

Olivia Jazbutis (2019-present)

Research: Understanding of cardinality; ideal spacing for practicing arithmetic facts

Honors: Honors Thesis; Glynn Research Grant

Shannon Celeste (2019-present)

Research: Understanding of cardinality; optimizing instruction for elementary math

Odalis Gonzalez (2019)

Research: Understanding of cardinality; optimizing instruction for second and third grade math

Claire Rudden (2018-2020)

Research: Understanding of cardinality; promoting student number sense

After Notre Dame: ACE Teaching Fellows

Alli VanOverberghe (2018-2020)

Research: Understanding of cardinality; optimizing instruction for second and third grade math

After Notre Dame: Graduate student in school psychology at Columbia University

Alice Felker (2017-2020)

Research: Understanding of cardinality; learning and developmental disabilities

Honors: Senior Thesis; ISLA Undergraduate Research Grant, Santos Award for Distinction in Psychology

After Notre Dame: Director of L'Arche Highland House

Samuel Adofo (2019-2020)

Research: Understanding of cardinality; education policy; mathematical equivalence

After Notre Dame: ACE Teaching Fellows

Caila Lindsey (2019)

Research: Understanding of cardinality; children's media use

After Notre Dame: Unknown; did not stay in lab through senior year

Katie Bellaschi (2019)

Research: Understanding of cardinality

After Notre Dame: Unknown; did not stay in lab through senior year

Christina Hayford (2018-2019)

Research: Understanding of cardinality

After Notre Dame: LU-CHOICE Service Through Teaching Program

Bridget Naylor-Komyatte (2018-2019)

Research: Understanding of cardinality; restorative justice in education

After Notre Dame: Immigration Counseling Service

Carolina Botero (2018-2019)

Research: Understanding of cardinality

After Notre Dame: Masters in Education at Columbia University

Maria "Lily" Kenesey (2018-2019)

Research: Understanding of cardinality

After Notre Dame: Masters in Education at University of Michigan

Grace Devitt (2018-2019)

Research: Understanding of cardinality

After Notre Dame: Research Assistant at University of Chicago

Elizabeth Chen (2017-2019)

Research: Understanding of cardinality; how the narrativity of books affects mathematics learning

Honors: Honors Thesis; Glynn Family Honors Program Undergraduate Research Grant

After Notre Dame: Postgraduate service with Bon Secours volunteer Ministry in Baltimore

Kimberly Walter (2017-2019)

Research: Understanding of cardinality; role of pediatricians in promoting early cognitive development

Honors: Senior Thesis; ISLA Undergraduate Research Grant

After Notre Dame: Medical School at Texas A&M

Wiktoria Kozłowska (2016-2019)

Research: Understanding of cardinality; stereotype threat

Honors: Honors Thesis; Glynn Family Honors Program Undergraduate Research Grant

After Notre Dame: Middle School Mathematics Teacher

Sarah Sun (2016-2018)

Research: How language shapes mathematical understanding

After Notre Dame: Educational Research Assistant at Child Trends

Zofia Zdanowicz (2017-2018)

Research: Individual differences in early understanding of mathematics, effects of poverty

Honors: Honors Thesis

After Notre Dame: Medical School at Loyola University

Regina Ekaputri (2016-2018)

Research: Use of visual thinking strategies to promote mathematical problem solving

Honors: Senior Thesis

After Notre Dame: ACE Teaching Fellows

Rachel Iverson (2015-2018)

Research: Understanding of cardinality

Honors: Summer Research Internship in Golinkoff's Lab at University of Delaware; Honors Thesis

After Notre Dame: AmeriCorps then Peace Corps

Jenna Galuska (2015-2018)

Research: Understanding of math equivalence; how to reduce stereotype threat in women math majors

Honors: CLAD Lab's NSF Summer Research Fellowship for Math Majors; Honors Thesis

After Notre Dame: Analyst with Huron Consulting Group

Alex Acuna (2015-2017)

Research: Factors that affect people's attention to number

After Notre Dame: Case Western Reserve University School of Medicine

Alexandria Viegut (2015-2017)

Research: Approximate number system (ANS) training and understanding of cardinality

Honors: Honors Thesis; Glynn Family Honors Program Undergraduate Research Grant

After Notre Dame: Graduate school in educational psychology at University of Wisconsin-Madison

Thomas Hughes (2015-2017)

Research: Which concepts and skills provide the best foundation for children's school math learning?
After Notre Dame: Deloitte in NYC

Natalie Vos (2015-2017)

Research: Which concepts and skills provide the best foundation for children's school math learning?
After Notre Dame: PACE Teaching Fellows

Elena Silla (2014-2017)

Research: Approximate number system (ANS) training and understanding of math equivalence
Honors: ISLA Undergraduate Research Grant; Summer Research Internship in the Social Cognitive Development Lab at Yale University; ACE Intern; Senior Thesis
After Notre Dame: ACE Teaching Fellows

Shannon Gaylord (2014-2017)

Research: Understanding of mathematical equivalence and understanding of cardinality
Honors: Senior Thesis
After Notre Dame: Masters in Social Work at University of North Carolina at Chapel Hill

Patrick Rodgers (2015-2016)

Research: Understanding of cardinality
After Notre Dame: ACE Teaching Fellows

Alexandra Bohnsack (2015-2016)

Research: Kindergarten intervention and understanding of cardinality
Honors: Honors Thesis; Glynn Family Honors Program Undergraduate Research Grant
After Notre Dame: ACE Teaching Fellows

Taylor Kelly (2014-2016)

Research: Understanding of mathematical equivalence
After Notre Dame: ACE Teaching Fellows

Ellie Sato (2013-2016)

Research: Understanding of mathematical equivalence
Honors: Department of Psychology Senior Recognition Award
After Notre Dame: Medical school at University of Wisconsin-Madison

Steven SonSon (2014-2015)

Research: Understanding of mathematical equivalence
After Notre Dame: Unknown; did not stay in lab through senior year

Grace Bunsu (2013-2015)

Research: Understanding of cardinality and understanding of mathematical equivalence
After Notre Dame: Position in Human Resources

Emily Geiger-Medina (2013-2015)

Research: Understanding of mathematical equivalence and effects of approximate number system (ANS) training in children at risk of academic failure
After Notre Dame: Mathematica Policy Research

Alex Bohem (2013-2015)

Research: Understanding of math equivalence; understanding of cardinality

Honors: CLAD Lab's NSF Summer Research Fellowship for Math Majors; Honors Thesis; Glynn Family Honors Program Undergraduate Research Grant

After Notre Dame: ACE Teaching Fellows

Alice Tollaksen (2013-2015)

Research: Understanding of cardinality

Honors: Senior Thesis; ISLA UROP Senior Thesis Grant

After Notre Dame: Au Pair for family in Paris, France

Marisa Rieber (2012-2015)

Research: Understanding of math equivalence; gender differences in math performance

Honors: Senior Thesis

After Notre Dame: PACE Teaching Fellows

Valerie Williams (2012-2015)

Research: Understanding of mathematical equivalence

After Notre Dame: Masters in nursing at NYU

Erin Celeste (2012-2015)

Research: Understanding of mathematical equivalence

Honors: CLAD Lab's NSF Summer Research Fellowship for Math Majors; Honors Thesis; Glynn Family Honors Program Undergraduate Research Grant

After Notre Dame: ACE Teaching Fellows

Erin Foley (2013-2014)

Research: Understanding of mathematical equivalence

After Notre Dame: Unknown; did not stay in lab through senior year

Molly Knapp (2013-2014)

Research: Understanding of mathematical equivalence

After Notre Dame: Unknown; did not stay in lab through senior year

Casey Hall (2012-2014)

Research: Understanding of cardinality; Use of concreteness fading in math instruction

Honors: Summer Research Internship in the Laboratory for Child Development at John's Hopkins;

UROP Undergraduate Research Grant; Honors Thesis; Santos Award for Distinction in Psychology

After Notre Dame: Graduate student in psychology at University of Chicago

Katelynn Kelly (2012-2013)

Research: Understanding of mathematical equivalence

Honors: CLAD Lab's NSF Summer Research Fellowship for Math Majors

After ND: AmeriCorps then graduate student in Learning Sciences & Policy at University of Pittsburgh

Paul DiGaetano (2012-2013)

Research: Improving children's understanding of mathematical equivalence

After Notre Dame: Medical student at St. George's University

Rebecca Kibler (2011-2013)

Research: Arithmetic practice that promotes conceptual understanding and computational fluency
After Notre Dame: Teaching Assistant in the French Embassy's Teaching Assistant Program in France
then Teach for America

Andrea Renfroe (2010-2013)

Research: Arithmetic practice that promotes conceptual understanding and computational fluency
After Notre Dame: Graduate student in speech and language pathology at University of Washington

Serah Han (2010-2011)

Research: Use of the equal sign in 6th-8th grade textbooks in the U.S. and Japan
Honors: UROP Undergraduate Research Grant to conduct research in Japan
After Notre Dame: Unknown; did not stay in lab through senior year

Anne Smrek (2011-2012)

Research: Sources of individual differences in susceptibility to mental sets
Honors: Glynn Family Honors Program Summer Award; UROP Undergraduate Research Grant;
Honors Thesis
After Notre Dame: Graduate student in school psychology at Ohio State University

Mary Wheeler (2010-2012)

Research: Sources of individual differences in understanding of mathematical equivalence
Honors: Honors Thesis
After Notre Dame: Research Assistant at University of Texas at Dallas

Stephanie Borjas (2010-2012)

Research: Advantages and disadvantages of concrete vs. abstract representations in mathematics
Honors: McGrath Award (Summer UROP)
After Notre Dame: Graduate student in school psychology at University of Wisconsin

Lauren Wester (2010-2011)

Research: Effects of contextualization of mathematics problems on learning and transfer
After Notre Dame: Graduate student in French at Notre Dame, Fulbright Fellow

Erica Pepitone (2009-2011)

Research: Arithmetic practice that promotes conceptual understanding and computational fluency
After Notre Dame: Graduate student in Irish writing at Trinity College Dublin

Joanna Thurnes (2009-2010)

Research: Arithmetic practice that promotes conceptual understanding and computational fluency
Honors: Senior Recognition Award in Psychology
After Notre Dame: Graduate student in physical therapy school

Jenny Heipp (formerly Heil) (2008-2010)

Research: Early symbolic understanding; effects of games on children's mathematics learning
Honors: Honors Thesis; Senior Recognition Award in Psychology
After Notre Dame: Jesuit Volunteer Corps, Graduate student in psychological anthropology at Wash U

Emily Fyfe (formerly Conrad) (2007-2010)

Research: Advantages and disadvantages of concrete vs. abstract representations in mathematics

Honors: Loughrey Award (summer UROP), Honors Thesis, Santos Award for Distinction in Psychology, National Science Foundation (NSF) Graduate Fellowship

After Notre Dame: Graduate student in psychology at Vanderbilt University

Noelle Crooks (2008-2009)

Research: Effects of practice on problem solving

Honors: Honors Thesis, National Science Foundation (NSF) Graduate Fellowship Honorable Mention

After Notre Dame: Graduate student in psychology at University of Wisconsin-Madison

Krysten Bold (formerly Williams) (2007-2008)

Research: Arithmetic practice that promotes conceptual understanding and computational fluency

After Notre Dame: Graduate student in clinical psychology at Rutgers University

Matthew Gibson (2006-2008)

Research: Effects of problem format on young children's conceptual understanding of addition

Honors: McGrath Scholar (summer UROP), Honors Thesis, Santos Award for Distinction in Psychology

After Notre Dame: Teach for America

Christopher Howard (McNair/Notre Dame Scholars Program, summer 2007)

Research: Association between visual-spatial working memory and math performance

Research Staff Advising

Megan Miranda (2017-2018)

After Notre Dame: Graduate student in school psychology at Tufts University

Lauren Crawford (2016-2017)

After Notre Dame: Graduate student in educational psychology at Boston College

Brianna Devlin (2013-2016)

After Notre Dame: Graduate student in learning sciences at University of Delaware

Cristina Carrazza (2013-2015)

After Notre Dame: Graduate student in psychology at University of Chicago

Julie Johnson (2012-2014)

After Notre Dame: MBA program at Iowa State University

Mary McKeever (2011-2013)

After Notre Dame: School of Veterinary Medicine at the Ohio State University

April Dunwiddie (2007-2012)

After Notre Dame: Stay-at-home mom

Graduate Student Advising

Trey Cobb (2020-present)

Research: Harnessing and improving utility value interventions to help spark Black children's interest in math and other tools for liberating their community

Patrick Kirkland (2017-present)

Research: How the design of mathematics problems affects students' problem solving; number sense

Connor O'Rear (2014-present)

Research: Improving math skills in young children at risk for academic failure; cardinality
After Notre Dame: Postdoctoral Research Associate at Purdue University (w/ Purpura)

Caroline Byrd Horburg (2011-present)

Research: Understanding of mathematical equivalence
After Notre Dame: Postdoctoral Research Associate at Purdue University (w/ Karpicke)

Lori Petersen (2007-2013)

Research: Use of concrete objects and abstract symbols to represent mathematics concepts
After Notre Dame: Postdoctoral Research Associate at University of Chicago (w/ Levine & Beilock)

M. Claire Keultjes (2008-2010)

Research: Effects of formal mathematics instruction on informal mathematics reasoning
After Notre Dame: Had to leave program after Masters for health reasons

Postdoctoral Fellow Advising

Dana Chesney (2010-2013)

Educational background: B.S. University of Virginia, Ph.D. Rutgers (under Rochel Gelman)
After Notre Dame: Postdoctoral Research Associate at Ohio State University then Assistant Professor at St. John's University

Percival Matthews (2010-2012)

Educational background: B.A. Harvard, Ph.D. Vanderbilt (under Bethany Rittle-Johnson)
After Notre Dame: Assistant Professor at University of Wisconsin-Madison

Masters, Preliminary Examination, and Dissertation Committees

Abigail Csik Doolen (Dissertation, 2020-)

Jerry Fisher (Dissertation, 2018-2019)

Ariel Aguero (Masters, 2018-2019)

Amber Shoaib (Dissertation, 2017-2018)

Abbie Thompson (Masters, 2016-2017; Dissertation, 2017-2018)

Meg Trucano (Dissertation, 2012-2013)

Paul Stey (Masters, 2010-2011; Dissertation, 2013-2014)

Andrea Tamplin (Masters, 2007-2009)

Melissa Mitchell (Masters, 2008-2009)

M. Windy McNerney (Preliminary Examination, 2008)

Andrea Christensen (Masters, 2008)

University, Institute, College and Departmental Service

- 2020- TutorND, <https://sites.google.com/nd.edu/tutornd>
- 2020- Member, Search Committee for Director of the Institute for Educational Initiatives
- 2020 Facilitator/Mentor, A&L Grant Writing Program for Faculty Preparing NSF Grants
- 2020 Member, College Human Subjects Research Working Group
- 2019-present Member, IEI Seed Grant Review Committee
- 2018-2020 Member, Provost's Learning Initiative Committee
- 2017-present Faculty Mentor, Building Bridges Mentoring Program
- 2017-present Faculty Organizer, Cognition, Brain, & Behavior (CBB) Studies Group
- 2016-present Faculty Committee, ND Program for Interdisciplinary Education Research (PIER)
- 2016-present Chair, Frabutt Prize for Outstanding Community Based Research Selection Committee
- 2015-present Faculty Lecturer, Notre Dame Alumni Hesburgh Lecture Series
- 2015-18, Member, Department of Psychology Executive Committee of the Committee on
2019-20 Appointments and Promotions (CAP-EC)
- 2012-present Director, Interdisciplinary Minor in Education, Schooling, & Society, Notre Dame
- 2012-present Member, Institute for Educational Initiatives (IEI) Faculty Committee
- 2006-2018 Chair, E. M. Koppitz Child Psychology Graduate Fellowship Nomination Committee
- 2018-2019 Member, Institute for Educational Initiatives Terminal Degree Committee
- 2018 Member, ISLA Large Grant Committee
- 2018 Member, Department of Psychology Self-Study Committee
- 2018 Member, Search Committee for Visiting Assistant Professor of Psychology
- 2018 Panelist, "Holy Cross and the Philosophy of Education" (event for new ND faculty)
- 2016 Member, Cognition, Brain, & Behavior (CBB) Search Committee for Senior Hire
- 2015 Member, Cognition, Brain, & Behavior (CBB) Search Committee for Junior Hire
- 2015-2017 Member, Early Childhood Development Center (ECDC) Standing Committee
- 2014 Keynote Speaker, College of Arts & Letters Advisory Council Dinner
- 2014-2016 Member, Institute for Educational Initiatives (IEI) Grad Study Program Planning Committee
- 2014-2017 Member, University Committee on Women Faculty and Students
- 2014 Organizer/Host, Henkels Lecture presented by Seth Pollak, Ph.D. (award: \$3814)
- 2014-2016 Member, Advisory Grants Development Committee
- 2010-2016 Member, Policy and Planning Committee
- 2012 Member, National Math and Science Initiative (NMSI) Advisory Committee
- 2012 Member, Search Committee for the Lead Faculty Position for the IEI's Excellence in Science and Math Education Initiative
- 2012 Presenter, College of Arts & Letters Portion of Junior Parents Weekend
- 2009-2010 Member, Student Research Participation Committee
- 2009 Member, Search Committee for IEI Postdoc in Curriculum & Instruction
- 2008-2009 Member, Colloquium Committee
- 2008-2009 Member, Space, Parking, and Security Committee
- 2008-2009 Member, Ad-hoc Committee to Develop Protocol for Participant Payment
- 2008-2009 Member, Cognitive Search Committee
- 2008-2009 Member, Search Committee for the IEI Postdoc and Dissertation Award in Education
- 2007-2009 Faculty Mentor, Academic Honors Program for Student-Athletes at Notre Dame
- 2006-2009 Member, Committee for Change in Teaching Load
- 2007-2008 Member, Committee for Research Opportunities in the IEI
- 2007, 2009 Member, ACE Selection Committee
- 2007, 08, 16 Member, Developmental Area Preliminary Examination Committee

Professional Service

Associate Editor

Cognitive Science, 2018-present

Editorial Board member

Journal of Cognition and Development, 2016-present

Journal of Experimental Psychology: General, 2011-2017, 2021-

Memory & Cognition, 2020-

Journal of Educational Psychology, 2012-2020

Developmental Psychology, 2013-2018

Manuscript reviewer (ad hoc)

Acta Psychologica

American Educational Research Journal: Teaching, Learning, and Human Development

American Psychologist

Applied Cognitive Psychology

Applied Developmental Science

Behavioral and Brain Sciences

Child Development

Child Development Research

Cognition

Cognition and Instruction

Cognitive Development

Cognitive Psychology

Cognitive Science

Contemporary Educational Psychology

Developmental Psychology

Developmental Science

Early Childhood Research Quarterly

Educational Psychology Review

Frontiers in Developmental Psychology

Journal for Research in Mathematics Education

Journal of Cognition and Development

Journal of Educational Psychology

Journal of Experimental Child Psychology

Journal of Experimental Psychology: General

Journal of Experimental Psychology: Learning, Memory, & Cognition

Journal of Mathematical Behavior

Learning and Individual Differences

Learning and Instruction

Mathematical Thinking and Learning

Memory & Cognition

PLoS ONE

Psychological Science

WIREs: Cognitive Science

Grant reviewer

National Science Foundation (NSF)

EHR Discovery Research PreK-12 (DRK-12) (grant panel member), 2020-2021

EHR Core Research (ECR) (panel member), 2017-2018, 2019

EHR Core Research (ECR) (ad hoc), 2015, 2020

EHR Research and Evaluation on Science and Engineering (REESE) (ad hoc), 2012

SBE Perception, Action & Cognition (ad hoc), 2012

SBE Developmental and Learning Sciences (ad hoc), 2008, 2010

EHR Research on Learning in Formal and Informal Environments (DRL) (grant panel member), 2008

National Research Council Canada (NRCC)

Social Sciences and Humanities Research Council Insight Grants (ad hoc), 2020

Natural Sciences and Engineering Research Council Discovery Grants (ad hoc), 2013

U.S. Department of Education, Institute for Education Sciences (IES)

Math and Science Education (principal panel member), 2015-2018

Math and Science Education (rotating panel member), 2014

Austrian Science Fund (FWF), Humanities and Social Sciences (ad hoc), 2017

Nuffield Foundation (ad hoc reviewer), 2013

Award selection committee member

Member, Selection Committee for the 2019 IES Outstanding Predoctoral Award (awardee: TBD)

Member, Selection Committee for the 2016 APA Distinguished Scientific Award for Early Career

Contribution to Cognition and Human Learning (awardee: Tania Lombrozo)

Member, 2015 Boyd McCandless Award Selection Committee (awardee: Felix Warneken)

Chair, 2014 Boyd McCandless Award Selection Committee (awardee: Adriana Galvan)

Conference program committee member or chair

Panel chair (Spatial and Numerical Knowledge), Cognitive Development Society, 2019 Meeting

Program chair, AERA Division C, Section 3 (Mathematics), 2011 Meeting

Program committee member, Cognitive Science Society, 2010 Meeting

Program committee member, APA Division 7, 2008 Convention

Conference submission reviewer

Society for Research on Educational Effectiveness Meeting, Fall 2011, Fall 2013

Annual Conference of the Cognitive Science Society, 2005-2011, 2015

SRCD, Education: Literacy, Math, Science, Curriculum, Teaching, & Learning, 2013 Biennial Meeting

Annual Meeting of the American Educational Research Association, 2007-2012

SRCD, Neurodevelopmental and Cognitive Processes, 2011 Biennial Meeting

Book reviewer

John Wiley & Sons, Inc.

Community Involvement

2017-present Member, South Bend Community School Corporation (SBCSC) Restorative Justice Education Committee

2014-present Exhibitor and Donator to Science Alive! at the St. Joseph Co. Public Library

2007-present Editor, *Cognitive Development News*, a biannual newsletter my lab disseminates to teachers, parents, and administrators to keep them informed of research findings in psychology and education

2011-present Volunteer Prayer of the Faithful Writer, St. Joseph Church, South Bend, IN

2019 Invited Speaker, Talk With Your Baby, Robinson Community Center, South Bend, IN

2015 Invited Speaker, McKinley Primary Center Faculty/Staff Meeting

2015 Invited Speaker, St. Joseph High School Psychology Classes, South Bend, IN

2015 Instructor, Notre Dame "Teachers As Scholars" Program

2014 Invited Speaker, Mishawaka Catholic School Faculty/Staff Meeting

2009-2014 Invited Speaker, Notre Dame RET Summer Program for local math and science teachers

2006-2010 Participant in Annual American Cancer Society's Relay for Life

2006-2011 Volunteer Reader, "Read to a Child" Literacy Project with South Bend Public Schools

2009-2010 Bread Baker, St. Joseph Church, South Bend, IN

2005 Director, After-School Algebra Enrichment Programs, North Haven & Wallingford, CT

2003-2004 Coordinator, Middle + High School CCD Programs, St. Paul's, Madison, WI

2001-2003 Volunteer Mathematics Tutor (Undergraduate level), Madison, WI

1999-2005 Bread Baker, St. Paul's University Center, Madison, WI

2002 Facilitator, Professional Development Workshop for math teachers, Madison, WI

1997-2002 CCD Teacher, Elizabeth, PA (5th grade); Sun Prairie, WI (7th grade)

1993-1998 Volunteer for the Sudden Infant Death Syndrome Alliance, Pittsburgh, PA