

DANA MILLER - COTTO, Ph.D.

Curriculum Vitae

University of Delaware
College of Education and Human Development
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ACADEMIC APPOINTMENTS

- 2020 – **Postdoctoral Researcher**
College of Education and Human Development
University of Delaware
Advisor: Dr. Nancy Jordan
- 2017- 2019 **Postdoctoral Research Associate**
Learning Research & Development Center (LRDC)
University of Pittsburgh
Advisor: Dr. Christian Schunn

EDUCATION & TRAINING

- 2017 **Ph.D., Educational Psychology**, Temple University
Advisor: Dr. James P. Byrnes
- 2014 **M.Ed., Educational Psychology**, Temple University
Advisor: Dr. James P. Byrnes
- 2011 **B.A., Psychology**, City University of New York (CUNY) Lehman College
Advisor: Dr. Vincent Prohaska

Training in Advanced Quantitative Methods

Institute on Statistical Analysis: Development of Mathematics Competencies in Early Childhood, AERA-NSF
The Meta-Analysis Training Institute (MATI), IES Instructors: Drs. Terri Pigott, Natasha Beretvas,
Elizabeth Tipton, Josh Polanin, and Ryan Williams
Introduction to Systematic Review and Meta-Analysis, Instructors: Drs. Tianjing Li and Kay Dickersin
Item Response Theory Modeling, Instructor: Dr. Tenko Raykov
Hierarchical Linear Modeling, Instructors: Drs. Stephen Raudenbush and Anthony Bryk
Structural Equation Modeling, Instructor: Dr. Mark Schmitz

Statistical Software Knowledge: SPSS, Stata, R Programming Language

RESEARCH INTERESTS

STEM education, executive functions, early math skills, individual differences, scaffolded instruction, disparities in educational achievement, meta-analyses

RESEARCH SUPPORT

Our Mathematical World, D. Purpura (PI) and others; **D. Miller-Cotto (Consultant)**, funded by the EF+Math Program via NewSchools Venture Fund, \$4,000,000, total, funded August 1st, 2020 to July 31st, 2024 (funding renewed yearly contingent on milestones).

Aligning Teaching Methods and Students' Learning Needs: Active Learning vs. Traditional Classrooms, A. J. Schikorra (PI), R. Alvarado (Co-PI), **D. Miller-Cotto (Co – PI)**, funded via the University of Pittsburgh's Provost's Personalized Education Grant Program, \$26, 306 total, funded February 1, 2018 to June 30, 2019.

Memory Illusions: Fonts and Serial Position Assignments, **D. Miller-Cotto (PI)**, V. Prohaska (Co-PI), funded via Psi Chi/Association for Psychological Science, \$5,000 total, funded

for Summer 2010.

HONORS, AWARDS, & FELLOWSHIPS

2019 - 2020	Mindset Scholars Network: Inclusive Mathematics Environments Early Career Fellowship [\$10,000]
2019	Wisconsin Center for Education Research (WCER) Carl A. Grant Lecture Scholar
2017	Cognitive Development Society (CDS) Diversity Travel Award
2014 - 15	Future Faculty Fellowship, Temple University
2011 - 14	College of Education Research Assistantship, Temple University
2011	Psi Chi Kay Wilson Officer Team Leadership Award, CUNY Lehman College Chapter
2011	The CUNY Lehman College Foundation Scholarship
2010 - 11	Louis Stokes Alliance for Minority Participation (LS-AMP) in STEM via the National Science Foundation Recipient
2008	Psi Chi International Honor Society in Psychology

REFEREED JOURNAL ARTICLES

1. Barbieri, C.A., & **Miller-Cotto, D.** (in press). The importance of adolescents' sense of belonging to mathematics for algebra learning. *Learning and Individual Differences*.
2. **Miller-Cotto, D.**, & Schunn, C. (2020). Mind the Gap: How a large-scale course re-design in economics reduced performance gaps. *Journal of Experimental Education, 1-14*. doi: 10.1080/00220973.2020.1805717
3. Wang, M.T., Smith, L.V., **Miller-Cotto, D.**, & Huguley, J.P. (2020). Parental ethnic-racial socialization practices and children of color's academic outcomes: A meta-analytic review. *Child Development*. doi: 10.1111/cdev.13254
4. **Miller-Cotto, D.**, & Byrnes, J. P. (2020). What's the best way to characterize the relationship between working memory and achievement?: An initial examination of competing theories. *Journal of Educational Psychology, 112*(5), 1074–1084. doi: 10.1037/edu0000395
5. **Miller-Cotto, D.**, & Auxter, A. E. (2019). Testing the ecological validity of faded worked examples in algebra. *Educational Psychology*. doi: 10.1080/01443410.2019.1646411
6. Byrnes, J.P., Wang, A. H., & **Miller-Cotto, D.** (2019). Children as mediators of their own cognitive development in kindergarten. *Cognitive Development, 50*, 80-97. doi: 10.1016/j.cogdev.2019.03.003
7. Barbieri, C. A., **Miller-Cotto, D.**, & Booth, J. L. (2019). Lessening the load of misconceptions: Design-based principles for algebra learning. *Journal of the Learning Sciences, 28*, 1-37. doi: 10.1080/10508406.2019.1573428
8. Byrnes, J. P., **Miller-Cotto, D.**, & Wang, A. H. (2018). Children as mediators of their own development: The case of learning science in kindergarten and first grade. *Journal of Cognition and Development, 19*, 248 – 277.
9. **Miller-Cotto, D.**, & Byrnes, J. P. (2016). Ethnic/racial identity and academic achievement: A meta-analytic review. *Developmental Review, 41*, 51-70. doi: 10.1016/j.dr.2016.06.003
10. Byrnes, J. P., & **Miller-Cotto, D.** (2016). The growth of mathematics and reading skills in segregated and

diverse schools: An opportunity-propensity analysis of a national database. *Contemporary Educational Psychology*, 46, 34-51. doi: 10.1016/j.cedpsych.2016.04.002

BOOK CHAPTERS

11. Booth, J. L., McGinn, K. M., Barbieri, C., Begolli, K. N., Chang, B., **Miller-Cotto, D.**, Young, L. K., & Davenport, J. L. (2017). Evidence for cognitive science principles that impact learning in mathematics. In D. C. Geary, D. B. Berch, R. J. Ochsendorf & K. M. Koepke (Eds.), *Acquisition of complex arithmetic skills and higher-order mathematics concepts Vol 3* (pp. 297–325). Oxford, UK: Elsevier.

MANUSCRIPTS UNDER REVIEW/IN REVISION

Miller-Cotto, D., Booth, J. L., & Newcombe, N. S. (under review). Sketching and verbal self-explanation: Do they help middle school children solve science problems? Submitted for peer review on February 13th, 2021.

Miller-Cotto, D., & Lewis, N.A. (under review). Am I a “Math Person”? How classroom cultures shape math identity among minoritized students. Submitted for peer review on February 12th, 2021. [[Pre-Print](#)]

Miller-Cotto, D., Smith, L.V, & Wang, A.H. (revision resubmitted). Understanding working memory and mathematics development for ethnically/racially minoritized children through family academic socialization practices. Revision submitted to *Developmental Psychology* on January 24th, 2021.

Miller-Cotto, D. (under review). Examining working memory, cognitive load, and prior knowledge to explain mechanisms underlying the guidance fading effect in middle school math. Submitted for peer review on December 5th, 2020.

Zhang, H., **Miller-Cotto, D.**, & Jordan, N.C. (under review). Exploring co-development of executive functions and math achievement using cross-lagged panel model with fixed effects. Submitted for peer review on November 21st, 2020.

MANUSCRIPTS IN PREPARATION [only manuscripts with full drafts included here]

Hall, G., **Miller-Cotto, D.**, & Putzeys, S. (in prep). Early experiences and school readiness: A within and between exploration of the Opportunity Propensity Model [working title].

Miller-Cotto, D., Hallinen, N. R., & Booth, J. L. (in prep). Sketching as a tool to offload information from visuo-spatial working memory in middle school math.

Miller-Cotto, D., & Byrnes, J.P. (in prep). Working memory and achievement: Implications for a revised model of cognition and memory.

Miller-Cotto, D., Smith, L.V., & Wang, A.H. (invited; in prep). Changing the conversation: A culturally sensitive perspective on discussing and supporting executive functions for minoritized children and their families.

Scalise, N.R., Gladstone, J.R., & **Miller-Cotto, D.** (in prep). The effects of third-grade math interest on students’ mathematics achievement.

PRESENTATIONS

Miller-Cotto, D., Hall, G., Putzeys, S. (accepted). Early experiences and school readiness: A within and between exploration of the Opportunity Propensity Model. *To be presented to the 2021 Society for Research in Child Development Biennial Meeting*, Virtual Meeting.

- Zhang, H., **Miller-Cotto, D.**, Jordan, N.C. (accepted). Exploring Co-development of Executive Functions and Math Achievement Using Cross-lagged Panel Model with Fixed Effects. *To be presented to the 2021 Society for Research in Child Development Biennial Meeting*, Virtual Meeting.
- Miller-Cotto, D.**, Smith, L.V., Wang, A.H. (accepted). Understanding Executive Function and Mathematics Development for Racially Minoritized Children through Family Academic Socialization Practices. *To be presented to the 2021 Society for Research in Child Development Biennial Meeting*, Virtual Meeting.
- Miller-Cotto, D.**, & Lewis Jr., N. (accepted). Mathematics identity for Black and Latinx Students: A literature synthesis. Accepted for presentation to the 2021 American Educational Research Association 2021, Virtual meeting.
- Barbieri, C.A., **Miller-Cotto, D.** (accepted). The relationship between adolescents' sense of belonging to mathematics and learning. Accepted for presentation to the 2021 American Educational Research Association 2021 meeting, Virtual meeting.
- Zhang, H., **Miller-Cotto, D.**, & Jordan, N.C. (2021 February). Exploring co-development of executive functions and math achievement using cross-lagged panel model with fixed effects. Presentation at Annual Conference, Mathematical Cognition and Learning Society (MCLS), Virtual meeting.
- Miller-Cotto, D.** & Wang, A. H. (2020, Apr 17 - 21) *Testing the Integrative Theory in Predicting School Readiness and Executive Function Skills for Minority and Other Kindergarten Children Using Structural Equation Modeling* [Poster Session]. AERA Annual Meeting San Francisco, CA <http://tinyurl.com/u66rtwk> (Conference Canceled)
- Wang, A. H. & **Miller-Cotto, D.** (2020, Apr 17 - 21) *Family Social Capital, Family Routines, and School-Readiness Skills of Asian American, Black, and Latinx Kindergarten Children* [Paper Session]. AERA Annual Meeting San Francisco, CA <http://tinyurl.com/qvg5x7p> (Conference Canceled)
- Miller-Cotto, D.**, Hallinen, N.R., & Booth, J.L. (July 2019). The role of sketching and visuo-spatial working memory in science accuracy. Presented to the Cognitive Science Society 2019 Meeting, Montreal, QB.
- Miller-Cotto, D.** (June 2019). Working memory: Reliability analysis of measures within mathematics in grade school age children in the United States. Pre-registration presented to the 2nd annual Mathematical Cognition & Learning Society, Ottawa, ON.
- Barbieri, C.A., **Miller-Cotto, D.**, & Booth, J. L. (April 2019) Error prevalence and visual signaling cues: Design based principles for algebra learning. Paper presented to the American Educational Research Association, Toronto, ON.
- Miller-Cotto, D.**, Booth, J. L., Chang, B. L., Cromley, J. G., Newcombe, N. S., & Williams, T.A. (March 2019). A comparison of sketching and self-explanation when solving math and science problems. Paper presented to the Society for Research in Child Development (SRCDD), Baltimore, MD.
- Barbieri, C.A., & **Miller-Cotto, D.** (March 2019). The relationship between adolescents' sense of belonging to the mathematics community and algebra performance. Paper presented at the 2019 International Convention of Psychological Science (ICPS), Paris, France.

- Byrnes, J.P., & **Miller-Cotto, D.** (2018, July). Testing theories of working memory and mathematics achievement. Poster presented to the Cognitive Science Society 2018 Meeting, Madison, WI.
- Miller-Cotto, D.**, & Schunn, C.D. (2018, June). Examining flipping in a calculus class: Does it work, and for whom? Poster presented to the International Workshop on Advanced Learning Sciences 2018, Pittsburgh, PA.
- Miller-Cotto, D.**, Barbieri, C., & Booth, J. L. (2018, April). Examining the impact of signaling cues and self-explanations on algebraic knowledge and learning. Paper presented at the 2018 Annual Meeting of the American Educational Research Association, New York, NY.
- Miller-Cotto, D.**, & Byrnes, J. P. (2018, April). Examining additional constructs to test the guidance fading effect. Poster presented at the 2018 Annual Meeting of the American Educational Research Association, New York, NY.
- Miller-Cotto, D.** (2017, October). Testing the faded worked example effect with cognitive load theory: It works, but for whom? Poster presented at the Cognitive Development Society Conference, Portland, OR.
- Miller-Cotto, D.**, Auxter, A. E., Byrnes, J. P., & Newton, K. J. (2017, April). Too much of a good thing: When faded worked examples decrease performance in algebra. Poster presented at the Society for Research in Child Development Biennial Meeting, Austin, TX.
- Miller-Cotto, D.**, Barbieri, C., & Booth, J. L. (2016, May). Increasing spatial contiguity to reduce students' misconceptions about algebra. Poster presented at the Fourth Annual Mathematical Cognition Conference, Fort Worth, TX.
- Miller-Cotto, D.**, Chang, B. L., Booth, J. L., Cromley, J. G., & Newcombe, N. S. (2016, April). The effects of sketching and self-explanation on students' monitoring use in problem solving. Poster presentation at the Bringing Cognitive Science Research to the Classroom Conference, Arlington, VA.
- Miller-Cotto, D.**, David, S., Booth, J. L., Cromley, J. G., & Newcombe, N. S. (2016, April). Self-explaining encourages student monitoring in math and science problem solving. Poster presentation at the National Consortium for Instruction and Cognition Annual Meeting, Washington, D.C.
- Miller-Cotto, D.**, Auxter, A. E., Byrnes, J. P., & Newton, K. J. (2016, March). Examining the use of faded worked examples in real world classrooms. Poster presentation at the Eastern Psychological Association Conference, New York, NY.
- Miller-Cotto, D.**, Auxter, A. E., Byrnes, J. P., & Newton, K. J. (2016, February). Instruction, fading, and self-explanation: Increasing far transfers with schema-based instruction in college algebra. Paper presentation at the Eastern Educational Research Association Annual Conference, Hilton Head Island, SC.
- Miller-Cotto, D.**, & Menzies, C. M. (2015, April). Student-teacher racial incongruence and teacher perceptions' of student achievement: Testing ethnic identity as a buffer. Paper presentation at the American Educational Research Association annual meeting, Chicago, IL.

Miller-Cotto, D., & Booth, J. L. (2015, March). Contiguity and self-explanations: Reducing student misconceptions about algebra. Poster presentation for the Society for Research on Child Development Biennial Meeting, Philadelphia, PA.

Miller-Cotto, D., & Byrnes, J. P. (2015, March). Ethnic/racial identity and academic achievement: A meta-analysis. Poster presentation at the Society for Research on Child Development Biennial Meeting, Philadelphia, PA.

Miller-Cotto, D., & Byrnes, J. P. (2014, October). Cognitive and socio-emotional development in schools that vary in diversity: An opportunity-propensity analysis of a national database. Poster Presentation at the Sixth Annual Temple University Graduate Fellows Research Symposium, Philadelphia, PA.

Miller-Cotto, D., & Byrnes, J. P. (2013, April). Diversity and academic achievement in American schools. Poster presentation at the Society for Research in Child Development Biennial Meeting, Seattle, WA.

Miller, D., & Prohaska, V. (2011, March). Memory illusions: Fonts and serial position assignments. Poster presentation at the Eastern Psychological Association Conference, Cambridge, MA.

Prohaska, V., Barbieri, C., **Miller, D.**, Monforte, P., & Orengo, D. (2011, March). Two heads are not always better than one. Poster presentation at the Eastern Psychological Association Conference, Cambridge, MA.

INVITED TALKS AND LECTURES

Miller-Cotto, D. (November 2020). *The development of executive functions and mathematics: An Integrative Theory Perspective*. Occidental College Cognitive Science Speaker series.

Miller-Cotto, D. (October 2020). *Understanding working memory and mathematics development for ethnic/racial minority children through family practices*. Kent State University Cognitive Science Brown Bag series.

Miller-Cotto, D. (September 2020). *Applying the Integrative Theory to mathematics and executive function: Predicting school readiness for Asian-American, Black, and Latinx children*. University of Maryland Developmental Science Colloquium series.

Miller-Cotto, D. (October 2019). *Examining sketching as a tool to offload working memory in math*. Scholars of Color Lecture Series, Rossier School of Education, University of Southern California.

Miller-Cotto, D. (May 2019). *Toward an understanding of working memory and math performance inside and outside the classroom*. Carl A. Grant Scholars Lecture Series, Wisconsin Center for Education Research, University of Wisconsin – Madison.

Miller-Cotto, D. (November 2018). *Working memory and achievement: An exploration of competing theories*. Developmental Psychology Brown Bag, Department of Psychology, University of Pittsburgh.

Miller-Cotto, D. (October 2018). *In and outside the classroom: How is working memory related to math ability?* Educational Psychology Colloquium, Department of Human Development and Quantitative Methods, University of Maryland.

Miller-Cotto, D. (January 2018). *Sketching and self-explanation: A comparison of two cognitive based strategies used to improve sixth graders' problem solving in math and science*. Pitt Cognitive Brown Bag

Series, Learning Research & Development Center, University of Pittsburgh.

Miller-Cotto, D. (October 2017). *Sketching and verbal self-explanation: Do they help middle school children solve math and science problems?* School of Education Graduate Colloquium Series, University of Pittsburgh.

Miller-Cotto, D. (March 2017). *Characteristics of students who benefit from faded worked examples in geometry.* Educational Research Seminar series, Temple University.

Miller-Cotto, D. (February 2017). *Testing the ecological validity of faded worked examples in a developmental mathematics classroom.* Temple Institute for Learning and Education Sciences (TILES) series, Temple University.

RESEARCH EXPERIENCE

- 2020 – present **Postdoctoral Researcher**, NSF Early Fractions Project
College of Education and Human Development
University of Delaware
Principal Investigators: Drs. Nancy Jordan, Nora Newcombe, Christina Barbieri
- 2019 - 2020 **Research Scientist**, Neuroscape Research Center (20% effort appointment)
Project iLead Network
University of California San Francisco
Principal Investigator: Dr. Melina Uncapher
- 2017 – 2019 **Postdoctoral Research Associate**, Schunn Lab
Learning Research & Development Center, University of Pittsburgh
Principal Investigator: Dr. Christian D. Schunn
- 2015 - 2017 **Research Assistant**, Sketching and Self-Explanation in Math and Science
Psychological Studies in Education, Temple University
Principal Investigators: Drs. Julie L. Booth, Jennifer Cromley, Nora Newcombe
- 2011- 2014 **Research Assistant**, Cognitive and Social Predictors of Achievement, Mathematical Performance and Problem Solving
Department of Psychological Studies in Education, Temple University
Advisor: Dr. James P. Byrnes
- 2010 - 2011 **Research Assistant**, Parenting and Executive Function Study
Department of Psychology, CUNY Lehman College
Principal Investigator: Dr. Keith R. Happaney
- 2009 - 2011 **Research Assistant**, Learning and Memory Lab
Department of Psychology, CUNY Lehman College
Principal Investigator: Dr. Vincent Prohaska

TEACHING EXPERIENCE

- Fall 2020 **Guest Lecturer**, Developmental Psychology and Social Justice, University of Pennsylvania, Janay M. Garret, Lecturer
- Spring 2019 **Guest Lecturer**, Advanced Research Design for Causal Inference
University of Delaware, Drs. Christina A. Barbieri and Henry May, Lead Professors
- Spring 2017 **Adjunct Instructor**, Child Development: Birth to Nine Years, Temple University
- Spring 2014 **Adjunct Instructor**, Cognitive Development, Temple University
- Fall 2013 **Teaching Assistant & Guest Lecturer**, Cognitive Development, Temple University
- Fall 2013 **Assistant Course Developer**, Multivariate Statistics, Temple University,
Dr. Jennifer G. Cromley, Lead Professor

MENTORING & SUPERVISING

University of Delaware

- Kamal Chawla, College of Education and Human Development, University of Delaware, Graduate Research Assistant, 2020 – present.
- Sarah Clerjuste, College of Education and Human Development, University of Delaware, Graduate Research Assistant, 2020 – present.
- Emma Kassan, College of Education and Human Development, University of Delaware, Lab Manager, 2020 – present.
- Haobai Zhang, College of Education and Human Development, University of Delaware, Learning Sciences Graduate Researcher, 2020 – present.

Temple University

- Stephanie David, College of Education, Temple University, Undergraduate Research Assistant, 2015 – 2017.

EDITORIAL AND REVIEW EXPERIENCE

- 2020 – present Editorial Board, *Contemporary Educational Psychology*
- 2019 – present Editorial Board, *Journal of Experimental Education*
- 2020 Review Panelist, Bill and Melinda Gates Foundation, Balancing the Equation: A Grand Challenge for Algebra
- 2020 Review Panelist, Spencer Foundation
- 2020 Review Panelist, National Science Foundation
- 2019 Review Panelist, National Science Foundation
- 2019 Program Reviewer, American Educational Research Association Division C: Learning and Instruction/1c Mathematics; SIG Early Education and Child Development
- 2018 Program Reviewer, American Educational Research Association Division C: Learning and Instruction/1c Mathematics
- 2018 Program Reviewer, Society for Research in Child Development

Ad-Hoc Reviewer

British Journal of Educational Psychology, Child Development, Cognitive Research: Principles and Implications, Contemporary Educational Psychology, Journal of Experimental Education, Journal of Experimental Child Psychology, Journal of the Learning Sciences, Journal of Research in Education, Learning and Instruction, Mathematics Education Research Journal, PLOS One

COMMITTEE SERVICE

- 2020 – 2021 Policy and Practice Co-Chair, Mathematical Cognition and Learning Society (MCLS)
- 2019 – present Committee Member, American Psychological Association Division 15: Educational Psychology, Early Career Educational Psychologists Committee

- 2019 Panelist, Professional Development Workshop: Rock the Postdoc: How to Find, Obtain, and Thrive in a Postdoctoral Position, Society for Research in Child Development Biennial Meeting, March 2019.
- 2019 Symposium organizer and co-chair, *2019 International Convention of Psychological Science*, Symposium (March 2019): Cross-cultural Factors Relating to the Mathematical Cognition of Diverse Populations Across the Globe.
- 2018 – 2019 Committee member, Diversity and Inclusion Committee, Learning Research and Development Center (LRDC), University of Pittsburgh
- 2015 Panelist, Tactics 101: Surviving and Thriving in Your PhD Program, Temple University
- 2011 Chair, Proposal Review Board, Lehman College Scholarship Day, CUNY Lehman College

OUTREACH

Invited Speaker, (May 2020) “What are executive functions and what does it have to do with how my child learns?” TeenSHARP Parent Night, Wilmington, Delaware.

PROFESSIONAL AFFILIATIONS

American Psychological Association (APA: Division 15 Educational Psychology)
Mathematical Cognition and Learning Society (MCLS)
Society for Research on Child Development (SRCD)
SPARK Society