

ELENA MARIE SILLA, M. ED.

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EDUCATION

- 2021 – Present **Ph.D., Education** (Specialization - Learning Sciences)
University of Delaware
Advisors: Dr. Christina Barbieri, Dr. Nancy Jordan
- 2017 - 2019 **M.Ed., Elementary Education**
University of Notre Dame, Alliance for Catholic Education
Teaching Certification in the State of Indiana, Elementary, K-6
- 2013 - 2017 **B.A., Psychology, magna cum laude**
University of Notre Dame
Minors: Education, Schooling, and Society; Business Economics
Thesis: *Does Arithmetic Instruction in Classrooms Promote an Understanding of Math Equivalence?*
Advisor: Dr. Nicole McNeil

RESEARCH POSITIONS

- 2021- present **Graduate Research Assistant**, University of Delaware
Mathematical Cognition and Instruction Lab, Dr. Christina Barbieri
- Leading materials and protocol design for within-subjects classroom study on errorful learning
 - Conducting literature review on procedural flexibility, which is informing the development of my Qualifying Study
- 2019 - 2021 **Project Manager**, University of Wisconsin-Madison
Cognitive Development & Communication Lab, Dr. Martha Alibali
- Managed an NSF-funded project that investigated whether activating conceptual knowledge via an Intelligent Tutoring System improves algebra performance
 - Coordinated collaboration across universities, wrote IRB protocol, designed stimuli and materials, mentored and trained undergraduates, recruited and worked with participants, and assisted with writing and data analysis
- 2014 - 2017 **Undergraduate Research Assistant**, University of Notre Dame
Cognition, Learning, and Development Lab, Dr. Nicole McNeil
- Conducted a senior thesis to investigate the presence of research-based practices in the classroom during arithmetic instruction
 - Designed a study, recruited schools, collected observational data, analyzed data, and disseminated results to participating schools
- 2015 **Undergraduate Summer Researcher**, Yale University
Social Cognitive Development Lab, Dr. Yarrow Dunham
- Investigated how children perceived wealth and resource distribution in other children

- Developed stimuli, collected and analyzed data from over 300 children and adults, designed a comprehensive coding system, and presented results at a lab meeting

GRANTS & FELLOWSHIPS

2021	Unidel Distinguished Graduate Scholar Award, University of Delaware [\$170,000]
2021	Fontana Family Scholarship, University of Delaware [\$33,000]
2019	Alliance for Catholic Education College Football Playoff Foundation Grant for Educators [<i>Improving Literacy and Social Skills through Drama-Based Education</i> , \$700]
2018	Alliance for Catholic Education College Football Playoff Foundation Grant for Educators [<i>Incorporating Culturally Diverse Literature in the Classroom</i> , \$1,200]
2016	Undergraduate Research Opportunity Program Grant [<i>How is Math Equivalence Taught in Classrooms?</i> , \$230]
2015	President's Circle Summer Funding to fund research at the Social Cognitive Development Lab at Yale University [\$2,000]
2014	Undergraduate Research Opportunity Program Grant [<i>How does Approximate Number Training Work?</i> , \$1,704]

AWARDS

2014-2017	Dean's List, University of Notre Dame
2017	Senior Thesis Nominated for the Frabutt Prize for Outstanding Education Research in the Community, University of Notre Dame

PUBLICATIONS

MANUSCRIPTS IN PREPARATION

Silla, E. M., Barbieri, C. A., & Newton, K. (in preparation). Procedural flexibility measured through performance on word problems [working title].

Barbieri, C. A., & **Silla, E. M.** (in preparation). Errors and explanations [working title].

Nagashima, T., Bartel, A. N., **Silla, E. M.**, Vest, N. A., Alibali, M. W., & Alevén, V. (in preparation). Redesigning instructional tools through Pedagogical Affordance Analysis.

PEER-REVIEWED CONFERENCE PROCEEDINGS

Silla, E. M. (submitted). How do multi-digit multiplication problems promote procedural flexibility? An analysis of two fourth grade textbooks. Submitted to the forty-fourth annual meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education.

Vest, N. A., **Silla, E. M.**, Bartel, A. N., Nagashima, T., Alevén, V., & Alibali, M. W. (submitted). Submitted to the 44th Annual Meeting of the Cognitive Science Society, 2022.

Nagashima, T., Ling, E., Zheng, B., Bartel, A., **Silla, E.**, Vest, N., Anthony, L., Alibali, M. W., & Alevén, V. (submitted). Never too much? Examining the effect of visual scaffolding on performance and

learning in an Intelligent Tutoring System. Submitted to the 44th Annual Meeting of the Cognitive Science Society, 2022.

Nagashima, T., Bartel, A. N., Vest, N. A., **Silla, E. M.**, Alibali, M. W., & Alevan, V. (submitted). Choose proactively: Students' self-regulated use of visual representations in an Intelligent Tutoring System. Submitted to the International Conferences of the Learning Sciences, 2022.

Bartel, A. N., **Silla, E. M.**, Vest, N. A., Nagashima, T., Alevan, V., & Alibali, M. W. (2021). Reasoning about equations with tape diagrams: Insights from students and math teachers. In E. de Vries, J. Ahn, & Y. Hod (Eds.), *15th International Conference of the Learning Sciences–ICLS 2021* (pp. 685-688). International Society of the Learning Sciences, 2021

Nagashima, T., Bartel, A. N., Yadav, G., Tseng, S., Vest, N. A., **Silla, E. M.**, Alibali, M. W., & Alevan, V. (2021). Using anticipatory diagrammatic self-explanation to support learning and performance in early algebra. In E. de Vries, J. Ahn, & Y. Hod (Eds.), *15th International Conference of the Learning Sciences–ICLS 2021* (pp. 474-481). International Society of the Learning Sciences, 2021

Nagashima, T., Bartel, A. N., Tseng, S., Vest, N. A., **Silla, E. M.**, Alibali, M. W., & Alevan, V. (2021). Scaffolded self-explanation with visual representations promotes efficient learning in early algebra. In T. Fitch, C. Lamm, H. Leder, & K. Teßmar-Raible (Eds.), *43rd Annual Meeting of the Cognitive Science Society* (pp. 1858-1864). Cognitive Science Society.

Silla, E. M., Hornburg, C. B., & 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. C. Armstrong (Eds.), *Proceedings of the 42nd Annual Conference of the Cognitive Science Society* (pp. 2937-2943). Austin, TX: Cognitive Science Society.

Nagashima, T., Bartel, A. N., **Silla, E. M.**, Vest, N. A., Alibali, M. W., & Alevan, V. A. (2020). Experimental survey for diagrammatic self-explanations. In M. Gresalfi & I. S. Horn (Eds.), *Proceedings of International Conference of the Learning Sciences, International Society of the Learning Sciences* (pp. 35-43). Nashville, TN: International Society of the Learning Sciences.

Nagashima, T., Yang, K., Bartel, A. N., **Silla, E. M.**, Vest, N., Alibali, M. W., & Alevan, V. (2020). Pedagogical Affordance Analysis: Leveraging Teachers' Pedagogical Knowledge for Eliciting Pedagogical Affordances and Constraints of Instructional Tools. In M. Gresalfi & I. S. Horn (Eds.), *Proceedings of International Conference of the Learning Sciences, International Society of the Learning Sciences* (pp. 1561-1564). Nashville, TN: International Society of the Learning Sciences.

CONFERENCE POSTERS & PRESENTATIONS

* denotes undergraduate mentee

Silla, E. M., & Barbieri, C. A. (accepted February 2022). Underlying mechanisms of benefits of varying worked example types on algebra learning. Will present at the Bi-Annual meeting of the Cognitive Development Society, 2022.

Silla, E. M., Barbieri, C. A., & Newton, K. (submitted). Flexibility in both arithmetic and word problems predicts algebra outcomes [working title]. Submitted to the Mathematical Cognition and Learning Society, 2022.

- Silla, E. M.**, Vest, N. A., Bartel, A. N., Nagashima, T., Alevén, V., & Alibali, M. W. (submitted). Students' reasoning about diagrams [working title]. Submitted to the Mathematical Cognition and Learning Society, 2022.
- Bartel, A. N., **Silla, E. M.**, Vest, N. A., Nagashima, T., Alevén, V., & Alibali, M. W. (submitted). Do diagrams elicit more conceptual responses? [working title]. Submitted to the Mathematical Cognition and Learning Society, 2022.
- Silla, E. M.**, Tommasi, T.*, Vest, N. A., Bartel, A. N., Buehler, Z., Manhart, H., Petersdorff, M.*, Nagashima, T., Alevén, V., & Alibali, M. W. (2021). Fostering conceptual understanding of equation solving via an intelligent tutoring system. Poster presented at the Wisconsin Center for Education Research Poster Fair, Virtual Meeting [in-person meeting cancelled due to COVID-19]
- Vest, N. A., **Silla, E. M.**, Bartel, A. N., Nagashima, T., Alevén, V. A., & Alibali, M. W. (2021, April). Evidence from worked examples: Conceptually rich explanations predict conceptual gains on posttest. Poster presented at the 2021 Virtual Biennial Meeting of the Society for Research in Child Development.
- Bartel, A. N., **Silla, E. M.**, Vest, N. A., Nagashima, T., Tang, Y.*, Alevén, V. A., & Alibali, M. W. (2020). Do tape diagrams promote a focus on conceptual principles? Evidence from equation solving with an Intelligent Tutoring System. Symposium presentation submitted to the Annual Meeting of the Mathematical Cognition and Learning Society Conference [accepted, presented virtually due to COVID-19].
- Bartel, A. N., **Silla, E. M.**, Vest, N. A., Nagashima, T., Vincent, V. A., & Alibali, M. W. (2020, August). Reasoning about equations with tape diagrams: Do differing visual features matter? Poster presented at the 42nd Annual Virtual Meeting of the Cognitive Science Society.
- Palaguachi, C.*, Bartel, A., **Silla, E.**, & Alibali, M. (2020, November). Incorporating interventions in intelligent tutoring systems to enhance conceptual knowledge of mathematics. ePoster presented at the Annual Biomedical Research Conference for Minority Students 2020.
- Silla, E.** (2019, March). *Helping students find their voices: The power of Socratic seminars*. Presented at the Indiana Council for Teachers of English, Indianapolis, Indiana, United States.
- Silla, E.**, Bova, M., Martin, J., & Welsh, M. [co-authors] (2018, July). *Hands-on learning: Giving ELLs the tools for success*. Presented at the ACE Teaching Fellows Conference, Notre Dame, Indiana, United States.
- Ahl, R., **Silla, E.**, & Dunham, Y. (2015, October) Givers and keepers: Children expect greater giving from resource-rich than resource-poor individuals. Poster presented at the Biennial Meeting of the Cognitive Development Society, Columbus, OH.
- O'Rear, C., McNeil, N.M., Fuhs, M., & **Silla, E.** (2015, October) Approximate number system (ANS) acuity training in preschoolers from low-income homes. Poster presented at the Biennial Meeting of the Cognitive Development Society, Columbus, OH.
- Silla, E. M.**, O'Rear, C., McNeil, N.M., & Fuhs, M. (2015, May). Unraveling the relationship between the approximate number system and math achievement. Poster presented at the University of Notre Dame Undergraduate Scholars Conference, Notre Dame, IN.

PRACTIONER-FOCUSED PUBLICATIONS

Silla, E. M. (2019). One step at a time: A traditional school's journey into personalized learning [Whitepaper].

TEACHING EXPERIENCE

- 2022 *Introduction to Statistics*, University of Delaware (course co-designer)
- Assisted with development of supplemental materials for class activities (R scripts, instructional PowerPoints)
- 2017 - 2019 *Fourth Grade Teacher*, St. Cornelius Catholic School
- Implemented classroom activities and interventions based on cognitive science research to instruct fourth graders in multiple subject areas
 - Designed curricular materials in line with the Common Core State Standards

SERVICE TO THE PROFESSION

- Spring 2022 – present Education Graduate Association, University of Delaware (Secretary & Communications)
- Spring 2021 – present Mathematical Cognition and Learning Society (ad hoc reviewer)
- Spring 2021 – present International Society of the Learning Sciences (ad hoc reviewer)

PROFESSIONAL AFFILIATIONS

Mathematical Cognition and Learning Society
Cognitive Science Society

TECHNICAL SKILLS

R Studio, FileMaker, Qualtrics