Josh Medrano, Ph.D.

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ACADEMIC APPOINTMENTS

2023-   **Postdoctoral Scholar**, Kent State University
Learning and Individual Differences Lab
PI: Dr. Dana Miller-Cotto

EDUCATION

2019-2023   **Ph.D. in Human Development**, University of Maryland, College Park
Advisor: Dr. Richard W. Prather II
Dissertation: *Integrating perceptual and cognitive processes in mental arithmetic*
Dissertation Committee: Drs. Richard Prather (Chair), DJ Bolger,
            Doug Lombardi, Geetha Ramani, Tracy Riggins (Dean's Representative)

2018-2019   **M.Ed. in Educational Psychology-Applied Developmental Science**,
            University of Virginia
Advisor: Dr. Jamie Jirout

2013-2016   **B.A. in Psychology**, The Ohio State University

AWARDS

2023	Charles H. Flatter Fellowship
2023	Ann Wylie/Lee Thornton Dissertation Fellowship Nomination
2023	Department Travel Award
2022	Cognitive Developmental Society Diversity Award
2022	Department Travel Award
2021	Faculty-Student Research Award (with Advisor)
2020	The David and Winifred "Winkle" Fulk Fellowship Nomination
2020	Department Research Funding
2019-2021	Dean's Fellowship, stipend and tuition
2019	Department Travel Award
2014-2016	Dean's List

PEER-REVIEWED PUBLICATIONS

Medrano, J., & Prather, R.W. (2023). Rethinking executive functions in mathematical cognition. *Journal of Cognition and Development.* https://doi.org/10.1080/15248372.2023.2172414

Medrano, J., Crnosija, N., Prather, R. W., & Payne-Sturges, D. (2022). Bridging the environment and neurodevelopment for children's health: Associations between real-time air pollutant exposures and cognitive outcomes. *Frontiers in Psychology*. https://doi.org/10.3389/fpsyg.2022.933327

Prather, R.W., Benitez, V.L., Kendall Brooks, L., Dancy, C.L., Dilworth-Bart. J., Dutra, N.B., Faison, M.O., Figueroa, M., Holden, L.T.R., Johnson, C., **Medrano, J.**, Miller-Cotto, D. Matthews, P.G., Manly, J.J., Thomas, A.K. (2022). What can cognitive science do for people? *Cognitive Science*. https://doi.org/10.1111/cogs.13167

Medrano, J.*, Jaffe, J.,* Lombardi, D., Holzer, M.A., & Roemmele, C. (2020). Students' scientific evaluations of water resources. *Water*. https://doi.org/10.3390/w12072048

*Co-first authors

MANUSCRIPTS UNDER REVIEW

Miller-Cotto, D., Chan, J.Y.-C., & **Medrano, J.** (under review). Identifying challenging topics in mathematics: An analysis of student performance across domains. [Pre-registration: https://osf.io/xfvjp]. Submitted for peer review to *Contemporary Educational Psychology.*

Medrano, J., Miller-Cotto, D., & Prather, R.W. (under review). Testing the theoretical contributions of inhibitory control to arithmetic skills. [Pre-registration: https://osf.io/2aq5n?view_only=117319d14f3c4663a7c6043ed67e31f2]. Submitted for peer review to *Journal of Experimental Psychology.*

MANUSCRIPTS IN PREPARATION

Medrano, J., Miller-Cotto, D., Thompson, C.A., Devlin, B., & Schingledecker, M. (in prep). Individual differences in fraction understanding and relations to EF and spatial/relational reasoning. [Pre-registration: https://osf.io/98gzv].

Medrano, J. & Prather, R.W. (in preparation). Interactions between perceptual cues and working memory during mental arithmetic: A dual-task experiment.

CONFERENCE PRESENTATIONS

Chaired Symposium

Medrano, J. (Chair). *The role of perception in arithmetic cognition* [Symposium]. 2023 Mathematical Cognition and Learning Society Conference, Loughborough, UK.

Oral Presentations

Medrano, J. & Prather, R.W. (2023, June). Why does inhibitory control only sometimes associate with math? Insights from a review of executive function development research. In Hochman, S. (Chair). *Numerical Cognition Meets Executive Functions Symposium* [Symposium]. University of Surrey, Guildford, UK.

Medrano, J. & Prather, R.W. (2023, June). Integrating perceptual and cognitive processes in mental arithmetic. In Medrano, J. (Chair). *The role of perception in arithmetic cognition* [Symposium]. 2023 Mathematical Cognition and Learning Society Conference, Loughborough, UK.

Prather, R.W., & Payne-Sturges, D., **Medrano, J.**, Kendall Brooks, L., Johnson, C., & Crnosija, N. (2022, March). An asset based quantitative framework to characterize cognitive development of African-American children [Oral Presentation]. Bi-ennial Cognitive Development Society Conference 2022, Madison, WI.

Medrano, J. & Prather, R.W. (2021, March). Examining how numerical and non-numerical inhibitory control contribute to arithmetic skills: A path analytical approach [Lightning Talk]. 2021 Mathematical Cognition and Learning Society Conference.

Poster Presentations

Medrano, J., Miller-Cotto, D., Thompson, C.A., Devlin, B., & Shingledecker, M. (2024, March). Individual differences in third and sixth graders' fraction understanding and relations to EF and spatial skills. [Poster Presentation]. Submitted to the Bi-ennial Cognitive Development Society Conference 2024, Pasadena, CA.

Crnosija, N., **Medrano, J.**, Prather, R.W., & Payne-Sturges, D. (2022, September). The effect of COVID-19 lockdown/post-lockdown and season on children's exposure to PM2.5 and time expenditure by environment type [Poster Presentation]. 34th Annual Conference of the International Society for Environmental Epidemiology, Athens, Greece.

Medrano, J., Crnosija, N., Prather, R.W., & Payne-Sturges, D. (2022, March). *Bridging the environment and neurodevelopment for children's health study: An overview* [Poster Presentation]. Bi-ennial Cognitive Development Society Conference 2022, Madison, WI.

Medrano, J., Mohan, S., Jaffe, J.B., & Lombardi, D. (2021, August). Executive functions in plausibility judgments and scientific evaluations [Paper Presentation]. 31st Annual Meeting of the Society for Text and Discourse.

Dobaria, A., Bailey, J. M., Mohan, S., Klavon, T. G., **Medrano, J. R.**, Jaffe, J. B., & Lombardi, D. (2021, August). *Students' scientific evaluations of astronomy concepts* [Poster Presentation]. EARLI 2021—the 19th Biennial EARLI Conference, Gothenburg, Sweden.

Crnosija, N.*, **Medrano, J.***, Prather, R.W., & Payne-Sturges, D., (2021, August). Bridging the environment and neurodevelopment for children's health study: An overview [Poster Presentation]. Eighth Annual Public Health Research, College Park, MD.

Mohan, S., **Medrano, J.**, Lombardi, D., & Jaffe, J. (2021, August). Students' evaluations, plausibility perceptions, and knowledge shifts about climate change and water resources [Pre-recorded Poster Presentation]. 2021 Annual Meeting of the American Educational Research Association, San Diego, CA.

Medrano, J. & Prather, R. W. (2021, April). *Consistency of individual differences across number line tasks* [Poster Presentation]. Society for Research of Child Development 2021 Virtual Biennial Meeting.

Jaffe, J.,* **Medrano, J.,*** & Lombardi, D. (2020, August). Promoting scientific plausibility and knowledge shifts through modeled evaluation activities [Poster Presentation]. American Psychological Association Convention 2020, Washington, D.C.

Medrano, J. & Prather, R. W. (2020, June). *Cognitive, behavioral, and affective influences of mathematical achievement* [Conference Canceled]. 2020 Mathematical Cognition and Learning Society Conference, Dublin, Ireland.

Medrano, J.,* Jaffe, J.,* & Lombardi, D. (2020, April). Does the evidence support the model? Examining the effectiveness of two instructional scaffolds in science classrooms [Poster Presentation]. 30th Annual Meeting of the Society for Text and Discourse, Atlanta, GA.

Medrano, J. & Jirout, J. (2019, October). *The role of relative magnitude reasoning in space-math relations* [Poster Presentation]. Bi-ennial Cognitive Development Society Conference 2019, Louisville, KY.

Medrano, J. & Jirout, J. (2019, March). Thinking relatively: The role of magnitude in mathematical and spatial thinking [Poster Presentation]. 10th Curry Research Conference, Charlottesville, VA.

*Presenters contributed equally.

INVITED TALKS

Medrano, J.*, Crnosija, N.*, Prather, R.W., & Payne-Sturges, D., (2022). Bridging the environment and neurodevelopment for children's health study: An overview. GradTerp Exchange, College Park, MD.

Chen, R.*, Diallo, M.*, Hancock, M.*, Lampe, L.*, **Medrano, J.*,** Salt, J.*, & Wright, J.* (2019). *Motivation analysis of a multiage classroom: Exploring Agnor-Hurt Elementary.* The Virginia Chapter of Association for Learning Environments Annual Conference, Williamsburg, VA.

*Presenters contributed equally.

DEPARTMENTAL TALKS AND LECTURES

Medrano, J. & Prather, R.W. (2021, March). Examining how numerical and non-numerical inhibitory control contribute to arithmetic skills: A path analytical approach. Kent State Cognitive Psychology Brown Bag.

GRANT SUPPORT

Role: Principal Investigator

2023   NSF STEM Education Postdoctoral Research Fellowship [Not funded]
2022   Support Program for Advancing Research and Collaboration (SPARC) Award [Funded, Internal, University of Maryland] Amount: $500

Role: Graduate Research Assistant

2020-2023   New Schools Venture Fund EF+Math Program, "Accurate, precise and useful models of the learner." PI: Prather.

2019-2021   University of Maryland Catalyst New Directions Fund. "Environmental inequalities in neurocognitive development." PI: Prather & Payne-Sturges.

2019-2020   National Science Foundation (Discovery Research in K-12 Program).
               "Collaborative Research: Scaffolding Middle and High School Students' Scientific
               Evaluations of Sources and Alternative Claims in Earth and Environmental
               Sciences." PI: Lombardi.

RESEARCH EXPERIENCE

2019-present
Graduate Research Assistant, Cognition and Development Lab
University of Maryland, College Park, PI: Dr. Richard Prather
      Projects: Bridging the Environment and Neurodevelopment for Children's Health;
           Accurate, Precise, Equitable and Useful Models of the State of the Learner;
           Maryland Order of Operations (MOOS)
      Duties: Manuscript writing, designing research studies and procedures, training and
           mentoring research assistants, running participants on behavioral and EEG tasks,
           conducting data analysis using R and programming using MATLAB

2019-2020
Graduate Research Assistant, Science Learning Research Group
University of Maryland, College Park, PI: Dr. Doug Lombardi
      Projects: Model-Evidence-Link (MEL) Project, IC+MET
      Duties: Manuscript writing, data entry, data analysis (using R, SPSS, and warpPLS),
           conference presentations, lab meetings, website design and maintenance

2018-2019
Graduate Research Assistant, Research in Education and Learning Lab
University of Virginia, PI: Dr. Jamie Jirout
      Projects: Spatial learning as play, Role of magnitude in math and spatial thinking
      Duties: Data collection, data analysis and interpretation using SPSS, literature reviews,
           designing and running experiments using OpenSesame, conference presentations

2014-2016
Research Assistant, Cognitive Development Lab
The Ohio State University, PI: Dr. Vladimir Sloutsky
      Project: Development of categorization during inductive learning
      Duties: Running participants on eye-tracking and behavioral experiments using EyeLink
           and PsychoPy, programming in experiments, reviewing literature, scheduling
           graduate researchers and undergraduate research assistants in designated
           preschools and daycare centers

2015
Research Assistant Intern, Berkeley Early Learning Lab
University of California, Berkeley, PI: Dr. Fei Xu
      Projects: Development of nonsymbolic probability judgments

Duties: Participant recruitment, running child participants on campus and in museum, learning programming tools like MATLAB and BlendR, attending weekly meetings

TEACHING EXPERIENCE
Kent State University
Fall 2023
Guest Lecturer, EDHD 320 (1 section, 65 students), Children's Thinking, Instructor: Dana Miller-Cotto

University of Maryland
Spring 2023
Instructor, EDHD 306 (1 section, 40 students), Research Methods in Human Development

Fall 2022
Teaching Assistant, EDHD 306 (2 sections, 79 students), Research Methods in Human Development, Instructor: Richard Prather
Fall 2021
Guest Lecturer, EDHD 320 (1 section, 40 students), Human Development Through The Life Span, Instructor: Rachel Ghosh

PROFESSIONAL EXPERIENCE AND SERVICE
Department and University Service
Graduate School Field Committee for Developmental Science
        Graduate Student Liaison, Executive Committee, 2021-2023
Human Development Graduate Student Organization
        President, 2021-2022
        Professional Development Committee Co-Chair, 2019-2021
        Social Committee Co-Chair, 2019-2020
Graduate Student Government, University of Maryland
        Department Student Representative/Assembly Member, 2020-2021
        Graduate Research Appreciation Day Committee Member, 2020-2021

Academic Experience/Service
Ad Hoc Reviewer, Association for Psychological Science Conference, 2024 - Present
Feedback Reviewer, Application Statement Feedback Program, 2023 - Present
Editor, Application Statement Feedback Program, 2022 - Present
Ad Hoc Reviewer, Mathematical Cognition and Learning Society, 2021
Panel Moderator, Curry Research Conference, University of Virginia, March 2019

Journal Reviewing Activities
Infant Behavior and Development
Environmental Research

Museum Experience

Language Sciences Research Lab, The Ohio State University, 2014
>   Provided student assistance for the demonstration "Trick Sentences." https://u.osu.edu/thebln/language-outreach/.

Other Professional Experience

Graduate Student Coordinator, Summer Undergraduate Research Program,
>   University of Virginia, 2019

Administrative Assistant, T.C.P. World Academy, Cincinnati, OH, 2017-2018

Tutor/Corps Member, AmeriCorps/Ohio Math Corps, Cincinnati, OH, 2016-2017

PROFESSIONAL MEMBERSHIPS

Cognitive Development Society

Math Learning and Cognition Society

Society for Research in Child Development

GRADUATE COURSES TAKEN

Educational Psychology	General Linear Models	Structural Equation
Achievement Motivation	Data Management	Modeling
Quantitative Methods	Latent Variable Modeling	Causal Inference
Qualitative Methods		Applied Meta-Analysis

SPECIAL SKILLS

Experiment and survey programming (Gorilla.sc, Qualtrics, Psychopy, OpenSesame, Eyelink)

Statistical analysis (R, SPSS, STATA, Microsoft Excel)

Software development and statistical analysis (HTML, CSS, JavaScript, Python, MATLAB)

Foreign language (Native Ilocano, Fluent Tagalog, Intermediate French)

MENTORSHIP

University of Maryland

2021	Linus Ghanadan
2019-2020	Jasmine Williams
2019-2020	Divija Kambala