LYDIA BRADFORD

Postdoctoral Fellow
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EDUCATION

2024	Ph.D., Michigan State University, Measurement and Quantitative Methods, Dissertation: *A Latent-state trait model for multilevel mediation analysis with multiple time points*
2017	BA, Duke University, Romances Studies and Global Health, Thesis: *The Life of Haitian Creole Poetry Between 1975 and 2000: a Window to its Linguistic Identity and Resistance*

PROFESSIONAL EXPERIENCE

2025-present	Postdoctoral fellow, Northwestern University, Institute for Policy Research
2019-2024	Research Assistant, Michigan State University, College of Education Office of the Hannah Chair

TEACHING EXPERIENCE

Michigan State University

Teaching Assistant For: Quantitative Methods in Educational Research I and II

Topics Included: Descriptive Statistics, Probability, Introduction to Inference, Inference of Means, Proportions, Association of Categorical Variables, Correlation, Regression, Inference through regression, interactions and omitted variable bias, ANOVA, ANCOVA, R-squared, logistic regression, weighted least squares, and multilevel models.

Responsibilities Included: Assisted in teaching course through teaching various lessons, leading labs using SPSS, providing office hours, and grading assignments.

Institute for Policy Research, Northwestern University

Institute Assistant For: the Research Training Institute on Cluster-Randomized Trials and the Summer Research Training Institute on Improving Evaluations of R&D in STEM Education

Topics Included: Treatment Fidelity, Research Design (including, Individual Randomized RCTs, Block RCT, Cluster RCT, Block Cluster RCT, Propensity Score Matching, and Diff-in-Differences), Analysis of Data (including Average Treatment Effects, Conditional Average Treatment Effects, Growth Modeling, Moderator Analysis, and Mediator Analysis), External Validity, Power, and Recruitment

Responsibilities Included: Assisted in the two research design workshops, fielded questions regarding statistics and research design, and consulted groups during group projects

Tutoring and Consulting

Tutored Courses Including: Undergraduate Statistics Courses, Graduate Quantitative Methods Courses, Graduate-level Research Methods, Multivariate Statistics Courses, and Courses on Structural Equation Modeling

Graduate Students Consulting: provided consultation regarding data and analysis for master theses, doctoral dissertations, final projects, and scientific presentations

East Central High School

Courses taught: Forensic Science, AP Microeconomics, AP Macroeconomics, and Chemistry

Responsibilities Included: Developing and taught the three courses and syllabi, as well as all activities and tests. Developed the AP economics program at the High School.

HONORS AND FELLOWSHIPS

2019-2024	John A. Hannah Chair Award for Research Assistantship
2023	The Ascendium Postsecondary Practitioner Fellowship
2022	MSU Cloud Computing Fellowship
2019	Walker Hill Fellowship in Measurement and Evaluation
2017	James Rolleston Prize for Best Literary Honors Thesis in a Foreign Language

RESEARCH EXPERIENCE

CR-CESE: A culturally responsive project-based learning intervention in secondary science in Alabama and North Carolina. Worked on developing the Research design for a large cluster randomized control trial to be conducted in Alabama and North Carolina and conducted Power Analyses to determine the minimum sample size to detect a Treatment Effect for a science curriculum. Worked Collaboratively with three partner universities to adapt curriculum and plan for a field test and randomized control trial. Planned conference to expand partnerships and build basis and understanding with community members for recruitment and building trust for the study. (U.S Department of Education, $7,722,448: 2024-2029).

Sustaining Career Ambitions in STEM. Study on understanding how COVID affected different subgroups of US PhD graduates with regards to finishing their PhD, their funding, and their job placements for the end goal of understanding how to better support students to remain in STEM. Applied for and maintained access to Restricted data license for the Survey of Earned Doctorates. Worked on the analytic plan to theoretically and statistically understand how positionality can influence the impacts of global events on students' education and career decisions.

Investigating Conditional Average Treatment Effects for Small Subgroups using Machine Learning Methods. Both a Replication study on a hispanic conditional treatment effect found on a light-touch mind set study on freshman academic outcomes and an investigation into the use of machine learning to uncover conditional average treatment effects among small subgroups that may be under powered in frequentist methods. Worked collaboratively with colleagues within the university and across universities on applying new methods and replicating findings.

PIRE: Crafting Optimal Learning in Science Environments. Worked on the design and constructed the data file for the Randomized Control Trial of over 6000 students in Michi-

gan and California. Conducted analysis on data, including primary and secondary main effect analyses as well as other exploratory and causal analyses. Wrote reports of the study results, manuscripts, and book chapters. Presented findings at national and international conferences. (National Science Foundation, $3,602,431: 2015-2021).

Multiple Literacies in Project Based Learning. Worked on designing and constructing the data system for the Randomized Control Trial of over 2000 students in Michigan. Conducted analysis on data, including primary and secondary main effect analyses as well as other exploratory and causal analyses. Wrote reports of the study results, manuscripts, and book chapters. Presented findings at national conferences. (George Lucas Educational Foundation, $7,629,605.53: 2015-2022)

PUBLICATIONS

Book Chapters

Bradford, L. (2023). Use of machine learning to score teacher observations. In X. Zhai & J. Krajcik (Eds.), *Uses of artifical intelligence in stem education.* Oxford University Press

Chen, I.-C., Bradford, L., & Schneider, B. (2022). Learning career knowledge: Can ai simulation and machine learning improve career plans and educational expectations? In *Ai in learning: Designing the future* (pp. 137–158). Springer International Publishing Cham

Articles

Schneider, B. and Bradford, L. (2023). *Growing Growth-Mindset.* [Peer commentary on the article "Mindset × Context: Schools, Classrooms, and the Unequal Translation of Expectations into Math Achievement" by J. M. Carroll, D. S. Yeager, J. Buontempo, C. Hecht, A. Cimpian, P. Mhatre, C. Muller, and R. Crosnoe]. *Monograph Matters.*

Schneider, B., Chen, I., Bradford, L., & Bartz, K. (2022). Intervention initiatives to raise young people's interest and participation in stem. *Frontiers in Psychology*, *13*, 960327

Krajcik, J., Schneider, B., Miller, E. A., Chen, I.-C., Bradford, L., Baker, Q., Bartz, K., Miller, C., Li, T., Codere, S., & Peek-Brown, D. (2023). Assessing the effect of project-based learning on science learning in elementary schools. *American Educational Research Journal*, *60*(1), 70–102

Schneider, B., Krajcik, J., Lavonen, J., Salmela-Aro, K., Klager, C., Bradford, L., Chen, I.-C., Baker, Q., Touitou, I., Peek-Brown, D., Marias Dezendorf, R., Maestrales, S., & Bartz, K. (2022). Improving science achievement—is it possible? evaluating the efficacy of a high school chemistry and physics project-based learning intervention. *Educational Researcher*, *51*(2), 109–121

Schneider, B., & Bradford, L. (2020). What we are learning about fade-out of intervention effects: A commentary. *Psychological Science in the Public Interest*, *21*(2), 50–54

In Progress

Bartz, K. and Bradford, L. (2023). *Using a Bi-factor Model to Validate 3rd Grade Formative Science Assessments.* Manuscript in Preparation.

Bradford, L. and Bartz, K. (2023). *Intersections and Mediation of challenge, stress, and anxiety: the experiences of students in their high school lives.* Manuscript in Preparation.

Scientific Presentations

Bradford, L., (2024, September). *Model Specification for a Latent State Trait Model in Longitudinal Mediation Analysis* [Conference Poster Presentation]. SREE Annual Converence. Baltimore, United States.

Bartz, K. & Bradford, L. (2024, September). *Using a Bi-Factor Model to Validate 3rd Grade Formative Science Assessments* [Conference Poster Presentation]. SREE Annual Conference. Baltimore, United States.

Bradford, L., & Bartz, K. (2024, September). *What is the confounding effects of stress and anxiety on engagement and giving up and determination?* [Conference Presentation]. WERA Annual Meeting. Manchester, United Kingdom.

Bradford, L., Garah, L., Garcia-Vila, J., Ginzburg, T., & Nativ-Ronen, E. (2023, April). *Inclusivity in Higher Education: Practices Across DEI Offices in the US-Midwest and Israel* [Poster Session]. NARST Annual International Conference, Chicago, IL, United States.

Bartz, K., Bradford, L., Bateman, K., & Milly, C. (2023, April). *Optimal Learning Moments in Elementary Science Using in Situ Surveys: A Repeated Measures and Validation Study* [Conference Presentation]. AERA Annual Meeting. Chicago, IL, United States.

Bartz, K., & Bradford, L. (2023, April) *Using a bi-factor model to validate a 3rd grade formative science assessment* [Conference Presentation]. NCME Annual Meeting. Chicago, IL, United States.

Bradford, L. (2022, September). *Using machine learning to score teacher observations from field notes* [Poster Session]. SREE Annual Conference. Arlington, VA, United States.

Bradford, L., Bartz, K., Chen, I.-C., & Schneider, B. (2022, April). *Intersections of challenge, stress, and anxiety: When is the challenge too much?* [Conference Presentation]. AERA Annual Meeting. San Diego, CA, United States.

Bradford, L. (2021, December). *Crafting engaging science environments moderation effects using Bayesian inference* [Conference Presentation]. PIRE Research Seminar. Helsinki, Finland.

Invited Workshops

Vincent-Lancrin, S., Bradford, L., & Schneider, B. (2024, September). *Learning to Design and Implement Education Interventions* [Workshop]. World Education Research Association. Manchester, United Kingdom.

Schneider, B., Chen, I.-C., & Bradford, L. (2023, September). *Optimal learning moments: Measuring academic, social, and emotional learning in daily life* [Workshop]. Methodological Advances in Science Education Research. Rehovot, Israel.

Bradford, L. (2020, November). *Statistical Inference and ML-PBL Analysis* [Workshop]. Create for STEM Institute at MSU. East Lansing, MI, United States.

Skills

Programming

Proficient in: R, Python, Stata, SPSS, MPLUS, LaTex, Git, SQLite, Microsoft Office

Applications in: causal inference, statistical modeling and analysis, simulation studies, machine learning, recommender systems

Certificates

Graduate Certificate in Computational Modeling from Michigan State University Department of Computational Mathematics, Science, and Engineering

Selected coursework

Statistics: Item Response Theory, Advance Multivariate Data Analyses I and II, Applied Econometrics, Cross Sectional Econometrics I, Econometrics I and II, Psychometric Theory I, Bayesian Structural Equation Modeling

Computation: Intro to Computational Modeling and Data Analysis, Methods in Computational Modeling, Applied Machine Learning

Attended Workshops

How to Make Sure Measurement Decisions Don't Bias Study and Evaluation Results: A Psychometric Primer for Evaluators with Jim Soland, University of Virginia, and Stephan Tavares, University of Virginia. SREE Annual Conference. (September, 2023).

Estimating Impacts for Multisite Individually Randomized Trials (There's More to It than We Originally Thought) with Michael Weiss, MDRC, and Luke Miratrix, Harvard University. SREE Annual Conference. (September, 2021).

Languages

English (fluent), French (limited proficiency), Haitian Creole (limited proficiency)

Professional Memberships

American Educational Researchers Association
Society on the Research on Educational Effectiveness