Brittney E. Bailey, Ph.D.

Assistant Professor of Statistics

bebailey@amherst.edu (413) 542-2823 Amherst College PO Box 5000 Amherst, MA 01002-5000

November 3, 2023

Education

PhD in Biostatistics 2018

The Ohio State University Columbus, OH

MS in Statistics 2012

The Ohio State University Columbus, OH

BA in Mathematics (Minor in Statistics)

Messiah College Grantham, PA

Academic Positions

Assistant Professor of Statistics

2020 - Present

2010

Amherst College, Department of Mathematics and Statistics Amherst, MA

Postdoctoral Fellow and Visiting Assistant Professor of Statistics

2018 - 2020

Amherst College, Department of Mathematics and Statistics Amherst. MA

Research Positions

Biostatistics Research Associate

2015 - 2018

Institute for Behavioral Medicine Research (IBMR)

The Ohio State University Wexner Medical Center, Columbus, OH

PI/Mentor: Janice Kiecolt-Glaser (IBMR Director; Departments of Psychiatry, Psychology, and Health Behavior & Health Promotion)

Co-Mentor: Rebecca Andridge (Division of Biostatistics)

- Collaborated with an interdisciplinary team in the Stress & Health Lab, which investigates the impacts of stress, social experience, exercise, and diet on the immune and endocrine systems, metabolism, physical health, mental health, and social well-being.
- ▶ Used SAS and R to conduct statistical analyses including linear mixed effects models for longitudinal and nested data, ANCOVA, logistic regression, survival analysis, and spline regression.
- ▶ Presented oral and written reports weekly of statistical analyses across a variety of clinical studies, including randomized controlled trials and longitudinal observational studies with 50 to 500 participants.

- ▶ Assisted in grant-writing, including power calculations, study design, preliminary data analysis, statistical analysis plans, and refining hypotheses.
- ▶ Reviewed SAS and SPSS code and provided guidance for statistical analyses conducted by other graduate students and postdocs in the lab.

Biostatistics Summer Research Assistant

2014

The Ohio State University College of Public Health, Columbus, OH

PI/Mentor: Randi Foraker (Division of Epidemiology) Co-Mentor: Abigail Shoben (Division of Biostatistics)

- ▶ Conducted a simulation study to compare direction and statistical significance of effects between logistic regression and survival analysis (Cox proportional hazards) models when studying the influence of socioeconomic status on hospital readmission rates among heart failure patients.
- Explored attributes of 30-day hospital readmission from electronic health record data in the Atherosclerosis Risk in Communities (ARIC) study for emulation in the simulation study.

Publications

The author order for all publications is based on contribution.

Peer-reviewed Publications

- 1. Wilson SJ, **Bailey BE**, Malarkey WB, & Kiecolt-Glaser JK (2021). Linking marital support to aging-related biomarkers: Both age and marital quality matter. *Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, 76(2), 273–282. doi:10.1093/geronb/gbz106.
- 2. Wilson SJ, Padin AC, **Bailey BE**, Laskowski B, Andridge R, Malarkey WB, & Kiecolt-Glaser JK (2020). Spousal bereavement after dementia caregiving: A turning point for immune health *Psychoneuroendocrinology*, 118. doi:10.1016/j.psyneuen.2020.104717.
- 3. **Bailey BE**, Andridge R, Shoben, AB (2020). Multiple imputation by predictive mean matching in cluster-randomized trials. *BMC Medical Research Methodology*, 20(1), 1-16. doi:10.1186/s12874-020-00948-6.
- 4. Madison A, Woody W, **Bailey BE**, Lustberg M, Ramaswamy B, Wesolowsky R, Williams N, Reinbolt R, VanDesuen J, Sardesai S, Malarkey W, & Kiecolt-Glaser JK (2020). Cognitive problems of breast cancer survivors on proton pump inhibitors. *Journal of Cancer Survivorship*, 14(2), 226-234. doi:10.1007/s11764-019-00815-4.
- 5. Padin AC, Wilson SJ, **Bailey B**, Lustberg, MB, Farrar WB, Povoski SP, Agnese DM, Reinbolt RE, Wesolowski R, Williams N, Sardesai S, Ramaswamy B, Noonan AM, Vandeusen JF, Haas GJ, & Kiecolt-Glaser JK (2019). Physical activity after breast cancer surgery: Does depression make exercise feel more effortful than it actually is? *International Journal of Behavioral Medicine*, 26(3), 237-246. doi:10.1007/s12529-019-09778-3.
- 6. Wilson SJ, **Bailey BE**, Jaremka LM, Fagundes C, Andridge R, & Malarkey, WB (2018). When couples' hearts beat together: Synchrony in heart rate variability during conflict predicts heightened inflammation throughout the day. *Psychoneuroendocrinology*, 93, 107-116. doi:10.1016/j.psyneuen.2018.04.017.
- 7. Wilson SJ, Andridge RR, Peng J, **Bailey BE**, Malarkey WB, & Kiecolt-Glaser JK (2017). Thoughts after marital conflict and punch biopsy wounds: Age-graded pathways to healing. *Psychoneuroendocrinology*, 85, 6-13. doi:10.1016/j.psyneuen.2017.07.489.
- 8. Belury MA, Cole RM, **Bailey BE**, Ke JY, Andridge R, & Kiecolt-Glaser JK (2016). Erythrocyte linoleic acid, but not oleic acid, is associated with improvements in body composition in men and women. *Molecular nutrition & food research*, 60(5), 1206-1212. doi:10.1002/mnfr.201500744.

Other Contributions

- 1. Heggeseth B, Myint L, **Bailey BE** (March 31, 2018). Let's Join the Conversation. *American Statistical Association Section on Statistics Education Blog.* Available at https://statisticseducatio.wixsite.com/mysite/post/2018/03/11/lets-join-the-conversation.
- 2. **Bailey BE** (July 1, 2016). Classroom to Collaboration: Tips for a Successful Transition. *Amstat News, STATtr@k Column.* Available at https://stattrak.amstat.org/2016/07/01/classtocollab16/.

Interdisciplinary Research Projects

Collaborations

The projects below are longer-term collaborations that involve close, regular work with principal investigators on statistical aspects of their projects, usually from the proposal stage through project completion.

Improving social connectedness in homebound older adults

2021 - Present

PI: Renée Pepin (Centers for Health and Aging; Department of Community and Family Medicine) Geisel School of Medicine at Dartmouth

- ▶ Helped refine hypotheses, conducted power calculations, and wrote statistical analysis plan in a proposal for an RRF Foundation for Aging Research Grant, which was successfully awarded.
- ▶ Provided guidance on data collection and will conduct statistical analyses and contribute to manuscripts upon study completion (to be completed by spring 2024).

Meaning-making through public testimony

2019 - 2021

PI: Sarah Bunnell (Center for Teaching and Learning) Amherst College, Amherst MA

- ▶ Supervised three students in the process of scraping publicly available victim impact statements and demographic data from the sentencing trial of Larry Nassar, coding the narratives using qualitative codes defined by Dr. Bunnell, and conducting sentiment analysis on the victim statements.
- ▷ Assessed interrater reliability for three raters during qualitative coding of narratives and conducted exploratory and descriptive data analysis using combined data from qualitative codes, demographic data, and word count data from LIWC software.

Consultations

The projects below are brief or short-term consultations to help with statistical issues in a project.

Evaluating spaceflight-induced mitochondrial and zinc homeostasis changes in the murine brain 2023 PI: Sally Kim, Assistant Professor of Biology, Amherst College

▶ Discussed statistical analysis plan ad provided power calculations for submitting a request to the NASA Space Biology Biospecimen Sharing Program

Development of human brain organoid models to study mitochondrial health during spaceflight 2021 PI: Sally Kim, Assistant Professor of Biology, Amherst College (1 hour)

▶ Discussed statistical analysis plan for project proposal ahead of NASA grant application.

Error propagation in estimating rate of signal transduction in Dictyostelium discoideum cellsPI: Marc Edwards, Assistant Professor of Biology, Amherst College (2 hours)

▶ Recommended a "good enough" approach to a challenging statistical problem beyond my expertise, and provided resources and professional connections for further investigation.

NIMH Advanced Research Institute in Mental Health and Aging, Spring Retreat

2018

▶ Provided statistical consultation for a group of 16 early-career faculty during intensive grant-writing retreat.

Talks

Invited Conference Talks

- 1. Professional Strategies in Statistics: Mentoring Students for Professional Success (presentation and panel discussion). American Statistical Association Joint Statistical Meetings. Washington, DC. August 2022.
- 2. Making our Discipline More Diverse and Inclusive: A Fresh Look at ASA's Efforts to Be More Diverse and Inclusive (panel discussion). American Statistical Association Joint Statistical Meetings. Virtual. August 2021.
- 3. New predictive mean matching imputation methods for cluster randomized trials (with RR Andridge and AB Shoben). Joint Statistical Meetings. Denver, CO. August 2019.

Invited Colloquia

- 1. Building successful mentor/mentee relationships in the hybrid work era (panel discussion). American Statistical Association JEDI Outreach Group. Virtual. October 2023.
- 2. A noncomprehensive guide to statistical ethics in practice. The Jackson Laboratory. Virtual talk. June 2022.
- 3. Multiple imputation by predictive mean matching in cluster-randomized trials. Yale University Department of Biostatistics. Virtual talk. October 2021.
- 4. *Clinical trials and the problem of missing data*. Wellesley College Department of Mathematics. Virtual talk. February 2021.
- 5. *A noncomprehensive guide to statistical ethics in practice*. Williams College Data Science Bootcamp. Virtual talk. January 2021.
- 6. Multiple imputation by predictive mean matching in cluster-randomized trials. University of Massachusetts Department of Statistics. Virtual talk. October 2020.
- 7. Organizing for Productivity. StatFest. Virtual roundtable September 2020.
- 8. *A noncomprehensive guide to statistical ethics in practice*. Williams College Data Science Bootcamp. Virtual talk. January 2020.
- 9. Missing Data 101. Research Bytes @ MassMutual. Amherst, MA. April 2019.
- 10. Multiple imputation in cluster-randomized trials. Smith College Statistics and Data Science Program. Northampton, MA. February 2019.
- 11. *Multiple imputation in cluster-randomized trials*. Smith College Center for Women in Mathematics. Northampton, MA. November 2018.

Contributed Conference Talks

- 1. A new predictive mean matching approach to multiple imputation in cluster-randomized trials (with RR Andridge and AB Shoben). Annual Meeting of the Society for Clinical Trials (SCT). New Orleans, LA. May 2019.
- 2. Investigating multiple imputation in cluster-randomized trials (with RR Andridge and AB Shoben). Joint Statistical Meetings. Baltimore, MD. July 2017.
- 3. Analyzing binary outcome data from a partially clustered design (with AB Shoben). Joint Statistical Meetings. Chicago, IL. August 2016.
- 4. Analyzing binary outcome data from individually-randomized group treatment trials (with AB Shoben). Annual Meeting of the Society for Clinical Trials (SCT). Montreal, Quebec. May 2016.

5. Quality measures? The impact of modeling strategy and informative censoring on estimated readmission risk (with RR Andridge and AB Shoben). Joint Statistical Meetings. Seattle, WA. August 2015.

Posters

Contributed Posters

- 1. Missing data methods for cluster randomized trials. International Conference on Health Policy Statistics (ICHPS). San Diego, CA. January 2020.
- 2. Missing data in cluster randomized trials: Options for analysis in R. IMS 21st Meeting of New Researchers in Statistics and Probability. Fort Collins, CO. July 2019.
- 3. Investigating multiple imputation in cluster-randomized trials (with RR Andridge and AB Shoben). International Clinical Trials Methodology Conference (ICTMC) and Annual Meeting of the Society for Clinical Trials (SCT). Liverpool, UK. May 2016.
- 4. Individually randomized group treatment trials with binary outcomes (with AB Shoben). The Ohio State University, Cleveland Clinic Foundation, and Case Western Reserve University (OSU/CCF/CWRU) Joint Biostatistics Symposium. Columbus, OH. April 2016.
- 5. Classroom to collaboration: A grad student's guide. Conference on Statistical Practice (CSP). San Diego, CA. February 2016.
- 6. Individually randomized group treatment trials with binary outcomes (with AB Shoben). The Ohio State University Statistics and Biostatistics Graduate Student Poster Session. Columbus, OH. September 2015.
- 7. Quality measures? The impact of modeling strategy and informative censoring on estimated readmission risk (with AB Shoben and RE Foraker). Joint Statistical Meetings. Seattle, WA. August 2015.
- 8. Quality measures? The impact of modeling strategy and informative censoring on estimated readmission risk (with AB Shoben and RE Foraker). The Ohio State University, Cleveland Clinic Foundation, and Case Western Reserve University (OSU/CCF/CWRU) Joint Biostatistics Symposium. Cleveland, OH. April 2015.

Teaching Experience

Amherst College, Amherst, MA

Assistant Professor of Statistics

2020 - Present

Teaching

- ▶ STAT 135: Introduction to Statistics via Modeling, F20, S21, S22, S23
- ▶ STAT 231: Data Science, *F21*, *F22*
- ▶ STAT 456: Generalized Linear and Mixed Models, S21, S22, S23

Statistics Thesis Supervision

- ▶ Jessica Yu '22, Adjusting degrees of freedom for linear mixed models.
- ▶ Tony Ni '21, Evaluation of parameter estimation methods to handle left-censored missingness.

Postdoctoral Fellow and Visiting Assistant Professor of Statistics

2018 - 2020

- ▶ STAT 135: Introduction to Statistics via Modeling, F18, S19
- ▶ STAT 230: Intermediate Statistics. *F19*

The Ohio State University, Columbus, OH

Teaching Assistant 2014 – 2015

- ▶ PUBHBIO 2210: Biostatistics for Public Health Research, A14, S15
- ▶ PUBHBIO 2210H: Honors Biostatistics for Public Health Research. *S15*

Online Course Design Assistant

2014

▶ Recorded instructional examples for first online version of PUBHBIO 6210: Design and Analysis of Studies in the Health Sciences I.

Grader 2013 – 2014

- ▶ PUBHBIO 6210: Design and Analysis of Studies in the Health Sciences I, A13
- ▶ PUBHBIO 6211: Design and Analysis of Studies in the Health Sciences II, S14

Teaching Assistant 2012 – 2013

- ▶ STAT 1350: Elementary Statistics, *W12*
- ▶ STAT 1450: Introduction to the Practice of Statistics, S12, A12, S13

Grader 2012

▶ STAT 427: Introduction to Probability and Statistics, *S12*

Lecturer 2011

▶ STAT 1450: Introduction to the Practice of Statistics, A11

Columbus State Community College, Columbus, OH

Adjunct Instructor of Statistics

2013 - 2014

STAT 1350: Elementary Statistics, Su13, A13, S14, A14
 STAT 2450: Introduction to Statistical Analysis, Su13

Other Statistical Consultations

Amherst College Undergraduate Thesis Consultations

2019 - Present

- ▶ Molly Gans '23, Biology
- ▶ Heather Scott '21, Psychology
- ▶ Tyler Marovitz '20, Political Science
- ▶ Bree Barnes '20, Environmental Studies
- ▶ Erik Zhang '19, Biology
- ▶ Jeremy Margolis '20E, Sociology

Quantitative Module Development for MUSI 127

Fall 2019

Amy Coddington, Assistant Professor of Music, Amherst College

▶ Co-created a quantitative module for exploring and understanding time series graphs of music chart data in a First Year Seminar, What is Mainstream Music?

Mead Art Museum Visitor Records Analysis

2019

Emily Potter-Ndiaye, Head of Education and Curator of Academic Programs (4 hours)

▶ Supervised a student conducting descriptive analysis of visitor records, and made recommendations for improving visitor database and data collection process.

Honors and Awards

2023 Mu Sigma Rho Early Career Undergraduate Impact Award		2023
 Awarded to an early-career statistician for their dedicated and innovative approaches to empower students through teaching, leadership, and efforts on behalf of the profession. 	support	and
Mellon Grant: Reimagining the Commons in Statistics, Amherst College	2019 -	- 2021
riangleright Grant awarded to department to redesign undergraduate statistics curriculum		
Institute of Mathematical Statistics 21st Meeting of New Researchers in Statistics and Proba	bility	2019
▷ One of 60 early-career statisticians selected to participate.		
Biostatistics Fellow for NIMH Advanced Research Institute on Mental Health and Aging		2018
▷ One of 2 early-career biostatisticians selected to participate.		
NIH NCI Research Supplement to Promote Diversity in Health-Related Research	2015 -	- 2018
JSM Diversity Mentoring Program		2017
▷ One of 20 students selected to participate.		
Lester R. Curtin Award, American Statistical Association		2016
▷ Awarded to 3 promising, early-career health statisticians.		
University Fellow, The Ohio State University	2010 -	- 2011
Lubrizol Foundation Fellowship, The Ohio State University		2010
Ernest L. Boyer Scholar, Messiah College		2010
 Awarded to juniors who demonstrate a commitment to education, community engagement service. 	ent, and	
Sigma Zeta National Science and Mathematics Honor Society	2008 -	- 2010
Academic Dean's List, Messiah College	2006 -	
Provost's Scholarship, Messiah College	2006 -	- 2010
ightarrow Merit-based scholarship for excellent high school GPA, class rank, and ACT score.		
Lloyd and Lois Martin Multicultural Scholarship, Messiah College	2006 -	- 2010
Awarded to students who demonstrate strong scholarship and service or leadership in th community and are committed to promoting racial and ethnic diversity.	eir schoo	ol or
National Achievement Scholarship	2006 -	- 2007

Professional Development

- 1. Ethic of Care: Relational Teaching and Learning. Amherst College Provost's Annual Retreat on Teaching and Learning. Amherst, MA. August 2022.
- 2. Cluster Randomized Trial Designs in Cancer Care Delivery Research. National Cancer Institute short course by Karla Hemming and Monica Taljaard. Virtual. May 2022.
- 3. Course Design Workshop. Amherst College Center for Teaching and Learning. Amherst, MA. June 2022
- 4. Subgroup Analysis in Clinical Trials: Opportunities and Challenges. 14th Annual Conference on Statistical Issues in Clinical Trials. Virtual. April 2022.
- 5. *Teaching for Metacognitive Equity.* Amherst College Provost's Annual Retreat on Teaching and Learning. Amherst, MA. August 2021.
- 6. Cluster Randomized Clinical Trials: Challenges and Opportunities. 13th Annual Conference on Statistical Issues in Clinical Trials. Virtual. April 2021.
- 7. National Institute of Statistical Sciences (NISS) Writing Workshop August 2020.
- 8. Engaging Everyone. Electronic Conference on Teaching Statistics. June 2020.

- 9. Belonging in a Digital World. Amherst College Provost's Annual Retreat on Teaching and Learning. Amherst, MA. August 2019.
- 10. Methods for Causal Inference from Randomized Trials with Loss to Follow-up or Non-Adherence. SCT workshop lead by Ellie Murray and Ellie Caniglia. New Orleans, LA. May 2019.
- 11. Electronic Health Records (EHR) in Randomized Clinical Trials: Challenges and Opportunities. 12th Annual Conference on Statistical Issues in Clinical Trials. Philadelphia, PA. April 2019.
- 12. Syllabus Design Workshop. Amherst College Center for Teaching and Learning. Amherst, MA. January 2019.
- 13. Build → Improve → Share: Apps and Dashboards with Shiny. Women in Statistics and Data Science short course by Mine Çetinkaya-Rundel. Cincinnati, OH. October, 2018.
- 14. Working Together, Learning Together: Cooperative and Collaborative Learning. Amherst College Dean's Retreat on Inclusive Pedagogies. Amherst, MA. August 2018.
- 15. Fostering Diversity in Biostatistics. ENAR workshop. Washington, DC. March 2017.
- 16. Fostering Diversity in Biostatistics. ENAR workshop. Austin, TX. March 2016.
- 17. Propensity Score Methods: Practical Aspects and Software Implementation. CSP workshop by Adin-Cristian Andrei. San Diego, CA. February 2016.
- 18. Adaptive Designs: Overview, Hurdles, Examples, and Software. SCT workshop by Christopher S. Coffey. Arlington, VA. May 2015.
- 19. Addressing Cancer Health Disparities in Appalachia. Annual Ohio Appalachia Community Cancer Network Research Seminar. Columbus, OH. May 2015.
- 20. Advances in Clinical Trial Statistics: Multiplicity Adjustment and Sequential, Multiple Assignment, Randomized Trials. Innovative Methods Program for Advancing Clinical Trials (IMPACT) Symposium. Cary, NC. November 2014.

Service to the Profession

Officer, Committee on Minorities in Statistics, American Statistical Association

2023 – Present

Chair, StatFest National Organizing Committee

2023

Co-Chair, StatFest National Organizing Committee

2021 - 2022

▶ Organized conference to promote graduate studies and careers in statistics and data science among undergraduate students underrepresented in STEM.

Manuscript Reviewer 2017 – Present

▶ Journals in alphabetical order include BMC Public Health, BMC Women's Health, Clinical Trials, Epidemiology, Harvard Data Science Review, International Journal of Data Science and Analytics, Journal of Statistics Education, PLOS ONE, Population Health Metrics, Statistics in Medicine.

Campus Dialog Leader, LACOL QLab Project

January – September 2022

▶ Engaged in conversations within and across colleges in the Liberal Arts Collaborative for Digital Innovation (LACOL) about approaches to supporting student quantitative skills development and reported findings back to QLab Project Advisory Board.

Curriculum Reviewer, Data4Justice Curriculum of the QSide Institute

January – March 2022

Guest Editor, Special Issue in Foundations of Data Science

October 2020 – October 2021

Grant Reviewer, United Kingdom Research and Innovation Medical Research Council (UKRI MRC)

Judge, American Statistical Association Mental Health Statistics Section Student Paper Competition 2020

Member, StatFest National Organizing Committee

2018 - 2020

▶ Assisted in planning StatFest, including managing registration, moderating Q&A sessions, and ensuring operations ran smoothly during conference.

Co-Chair, StatFest Local Organizing Committee	2018
 Coordinated resources and accommodations at Amherst College and in surrounding area in preparation for StatFest 2018, and ensured operations ran smoothly during conference. 	
Panelist, StatFest Graduate Student Experience Panel	2017
Topic-Contributed Session Chair, Joint Statistical Meetings	2016
Topic-Contributed Session Chair, Society for Clinical Trials	2016

Other Outreach

STEM Incubator Lead 2020 – 2022

Developed and ran 6-week summer science-training program for a cohort of 18 first-generation, low-income, Black and Latinx students interested in science careers, in partnership with Marc Edwards (Assistant Professor of Biology) and Chris Durr (Assistant Professor of Chemistry).

▶ Worked with Office of Advancement to secure \$1.3 million gift to partially endow the STEM Incubator program as part of the STEM Student Research and Support Fund, in addition to \$155,000 in gifts to fund early iterations of the STEM Incubator program.

Intensive Advising 2020 – 2021

▶ Provided additional academic and social support for 3 students in their first two years at Amherst College, including meetings every 2-3 weeks in their first year.

Summer Bridge Faculty, Quantitative and Social Sciences Track

July - August 2020

▶ Co-taught Statistics class with Kevin Donges (Lecturer of Statistics), in program designed to support first-generation and low-incomes students in their transition to the college.

Service to Amherst College

Library Committee 2021 – 2023

New Faculty Orientation Panelist July 2021

▶ Course Design: What Does an Amherst Course Look Like?

Antiracism Faculty Leadership Committee

2020 - 2021

- ▶ Advised Amherst College President Biddy Martin and Provost and Dean of the Faculty Catherine Epstein on antiracism plans at the college and responses to student and alumni demands.
- ▶ Developed proposals for major curricular changes; met with focus groups of faculty, staff, and students to hear concerns and solicit feedback.
- ▶ Helped institute antiracism plans within each department and program, shared experiences for students in first year seminars that address race, and a pilot program for sophomore seminars at the college focused on antiracism

Graduate School Experience Panel, Meiklejohn Fellowship Program

February 2020

Faculty Panel, Diversity Open House

October 2019

Professional Memberships

American Statistical Association Since 2007
International Biometrics Society, Eastern North American Region (ENAR) Since 2016

Society for Clinical Trials	Since 2016
American Public Health Association	Since 2019
Society for Prevention Research	Since 2020