

KATHERINE BRUMBERG

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EDUCATION

- Ph.D. | *Statistics and Data Science*** Aug. 2019 – May 2024 (Expected)
The Wharton School of the University of Pennsylvania
- Certificate in Teaching and Learning | *Center for Teaching and Learning*** Jan. 2023
University of Pennsylvania
- B.S. and M.A. | *Statistics and Data Science*** Aug. 2015 - May 2019
Yale University

RESEARCH EXPERIENCE

- Graduate Researcher** Mar. 2020 - Present
The Wharton School: Paul Rosenbaum and Dylan Small
- Developed new methods for stratification and matching to achieve covariate balance in observational studies
- Undergraduate Researcher** Aug. 2016 - May 2019
Townsend Lab at Yale University
- Applied a population genetics and probabilistic framework to cancer evolution research, updating the group's prior model of mutation to account for altered selection due to epistatic interactions
- Research Experience for Undergraduates at Mathematical Biosciences Institute** Jun. 2017 - Aug. 2017
Ohio State University and Harvard School of Public Health
- Applied inverse probability weighting to adjust for selection bias in a secondary outcome study
 - Used causality model selection techniques to determine ordering of events in prostate cancer study

TEACHING EXPERIENCE

- Instructor of Record** Summers 2022 & 2023
Wharton Statistics and Data Science Department
- Taught the condensed six week summer course "Introductory Statistics" online (twice)
 - Syllabi and evaluations available at www.kbrumberg.com/teaching
- Graduate Teaching Assistant** Fall 2021 & Spring 2022
Wharton Statistics and Data Science Department
- Led recitation sections, assisted the professor with course preparation, and graded for the course "Introductory Statistics"
- Undergraduate Learning Assistant** Fall 2017 - Spring 2019
Yale Statistics and Data Science Dept.
- Helped instruct students and grade for the courses "Computational Tools for Data Science," "Theory of Statistics," "Data Mining and Machine Learning," and "Data Analysis"

WORK EXPERIENCE

- Modeling and Informatics Intern** Summers 2018 & 2019
Vertex Pharmaceuticals
- Implemented permutation tests to be run alongside the predictive models for compound activity to make sure that released models are performing better than random
 - Implemented iterative focused screening to select the best compounds to include in high throughput screens
 - Created an RShiny application to detect anomalies in the performance of control compounds over time
- Research Assistant** Summer 2018
Yale Statistics and Data Science Department
- Developed an RShiny application to help the department match undergraduate learning assistants with courses

PUBLICATIONS

6. Silber, J.H., Rosenbaum, P.R., Reiter, J.G., Jain, S., Ramadan, O.I., Hill, A.S., **Brumberg, K.**, Fleisher, L.A. (2023+). Grading Hospitals Using Multivariate Matching. *Submitted*.
5. **Brumberg, K.**, Small, D.S. & Rosenbaum, P.R. (2023+). Optimal Refinement of Strata to Balance Covariates. *Submitted*.
4. **Brumberg, K.**, Small, D.S., & Rosenbaum, P.R. (2023). Protocol for an Observational Study of the Effects of High School Football on Cognition Late in Life Using a New Matching Method. *Zenodo*. <https://doi.org/10.5281/zenodo.8349375>.
3. **Brumberg, K.**, Ellis, D.E., Small, D.S., Hennessy, S. & Rosenbaum, P.R. (2023). Using Natural Strata When Examining Unmeasured Biases in an Observational Study of Neurological Side Effects of Antibiotics. *J R Stat Soc Series C*. 72(2):314-329. <https://doi.org/10.1093/jrsssc/qlad010>.
2. **Brumberg, K.**, Small, D.S. & Rosenbaum, P.R. (2022). Using Randomized Rounding of Linear Programs to Obtain Unweighted Natural Strata that Balance Many Covariates. *J R Stat Soc Series A*. 185(4):1931-1951. <https://doi.org/10.1111/rssa.12848>.
1. Sinnott, J.A, **Brumberg, K.**, Wilson, K.M., Ebot, E.M., Giovannucci, E.L., Mucci, L.A. & Rider, J.R (2018). Differential Gene Expression in Prostate Tissue. *European Urology*. 74(5):545-548. <https://doi.org/10.1016/j.eururo.2018.05.006>.

SOFTWARE PACKAGES

3. **Brumberg, K.** (2023). triplesmatch: Match triples consisting of two controls and a treated unit or vice versa. *Coming soon*.
2. **Brumberg, K.** (2022). optrefine: Optimally Refine Strata. <https://CRAN.R-project.org/package=optrefine>.
1. **Brumberg, K.** (2021). natstrat: Obtain Unweighted Natural Strata that Balance Many Covariates. <https://CRAN.R-project.org/package=natstrat>.

BOOKS

1. Ewens, W., **Brumberg, K.** (2023). Introductory Statistics for Data Analysis. *Springer Nature*. <https://doi.org/10.1007/978-3-031-28189-1>.

HONORS AND AWARDS

J. Parker Bursk Research Prize Wharton School	2023
Brown Best Student Paper Award Wharton School	2022
Donald S. Murray Teaching Prize Wharton School	2022
George James Doctoral Fellowship Wharton School	2019
Graduate Research Fellowship National Science Foundation	2019
Statistics and Data Science Senior Award Yale University	2019
Y-Work Award for Outstanding Student Employees Yale University	2019
Henry S. McNeil Summer Fellowship Yale University	2016
Yale Club of Boston Scholarship Yale University	2015, 2016, 2018
Lori Laitman Roseblum Scholarship Yale University	2015

SERVICE

Peer Reviewer Journal of Causal Inference	Aug. 2023
President Wharton Society for the Advancement of Women in Business Academia (WSAWBA) <ul style="list-style-type: none">Led the organization which aims to support women in the Wharton doctoral programs	Sep. 2019 - Present
Mentor Wharton Pre-Doctoral Directed Reading Program <ul style="list-style-type: none">Developed a reading plan with an undergraduate student and met weekly to discuss the reading	Sep. 2022 - Dec. 2023
Advisory Board Member Wharton Pre-Doctoral Directed Reading Program <ul style="list-style-type: none">Matched undergraduate students with graduate members for the program and helped to develop the new program	Sep. 2021 - Present
Pen-pal Letters to a Pre-scientist <ul style="list-style-type: none">Wrote letters to a middle school student at a disadvantaged school to broaden awareness of what STEM professionals look like and serve as a source of inspiration	Sep. 2019 - Jun. 2023
Committee Member Wharton Statistics and Data Science Quinquennial Review <ul style="list-style-type: none">Gathered doctoral student feedback for the quinquennial departmental review	Jan. 2022 - Apr. 2022
Mentor Graduate School Mentoring Initiative <ul style="list-style-type: none">Mentored a first generation low income undergraduate student interested in applying to graduate school	Jan. 2021 - Jun. 2021
Co-President Splash at Yale <ul style="list-style-type: none">Led the nonprofit educational outreach organization which brings 1000 middle and high school students to campus to take hour long seminars taught by Yale students	Sep. 2015 - May 2019
Tutor New Haven Reads <ul style="list-style-type: none">Volunteered as a tutor for disadvantaged students reading below grade level in the New Haven school district	Feb. 2016 - May 2017

EXTERNAL CONFERENCES AND PRESENTATIONS

Optimal Refinement of Strata to Balance Covariates Joint Statistical Meetings	Aug. 2023 Oral presentation
Optimal Refinement of Strata to Balance Covariates Atlantic Causal Inference Conference	May 2023 Oral presentation
Optimal Refinement of Strata to Balance Covariates Lawrence D. Brown PhD Workshop	Nov. 2022 Oral presentation
Obtaining Unweighted Natural Strata that Balance Many Covariates Using Randomized Rounding of Linear Programs Joint Statistical Meetings	Aug. 2021 Speed presentation

SKILLS

Softwares: R, RShiny, Python, MATLAB, Mathematica, Stata, SPSS
Environments: LaTeX, Linux, Microsoft Office