QTM 385 - Experimental Methods

Danilo Freire*

Spring 2025

1 Course Description

Experimental methods have become increasingly important in social and life sciences, offering reliable ways to test theories and produce generalisable findings. This course covers the essential principles of experimental design, with emphasis on testing causal relationships. Students will learn about causal inference, experimental design techniques, and methods for addressing common challenges in experimental research, such as non-compliance and participant attrition. The course also explores blocking and covariate adjustment, heterogeneous treatment effects, and proper interpretation of results. Special attention will be given to reproducible research practices and ethical considerations in experimental studies.

This course is designed to be both applied and interactive, featuring lectures and hands-on sessions. Students will learn how to design and implement experiments and critically evaluate existing experimental research in their areas of interest. Moreover, students will have the opportunity to develop their writing and presentation skills by drafting an experimental research project and presenting their findings.

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2 Course Information

We will meet twice a week for 75 minutes each session. The course will be a mix of lectures, discussions, and hands-on activities. Therefore, it is important that you read the assigned readings before class. Students are encouraged to participate and are most welcome to express their views openly and freely. I would suggest you to bring some notes to the class so that we can discuss together the topics you find most interesting.

All information about the course will be available at `http://danilofreire.github.io/qtm385`. The syllabus will be updated periodically according to the progress of the class. Please remember to visit the website regularly.

3 Learning Objectives

By the end of this course, students will be able to:

1. Design rigorous experiments with proper randomisation procedures and sample sizing calculations
2. Create pre-analysis plans (PAP) and apply appropriate statistical methods for experimental analysis
3. Produce reproducible reports using Quarto
4. Evaluate experimental designs, identifying potential limitations
5. Manage unexpected data challenges, such as attrition and non-compliance
6. Understand ethical considerations in experimental design
7. Develop analytical skills through practical problem sets and discussion sessions

4 Prerequisites

This course is designed for students who have taken or are currently taking an introductory course in statistics. Some understanding of hypothesis testing, confidence intervals, and regression analysis is beneficial. However, if you have not taken such courses, that is also fine. The course is not math-heavy, and all concepts will be explained in detail in class. Some familiarity with `R` or `Python` is required, as we

will use these tools for data analysis. We can adjust the course accordingly if you need assistance. If you are unsure whether you meet the prerequisites, please contact me to discuss your background.

5 Software

We will use R for all data analysis in this course. R is a free and open-source software environment for statistical computing and graphics. You can download R from the Comprehensive R Archive Network (CRAN). You are free to use any text editor to write your R code, but I recommend using RStudio, VSCode, or Jupyter Notebooks with the R kernel. If you are feeling brave or want to learn some new skills, you can also use Neovim with the Nvim-R plugin. That is, if you can exit the editor. :)

We will also use Quarto to write the reports. Quarto is a new document format that combines the best features of Markdown, LaTeX, and R Markdown. It is easy to use, very versatile, and allows you to write reports, slides, books, and even websites in a single document. You can install Quarto from the Quarto website. We will have a hands-on session on how to use Quarto in the course, and I have prepared templates for your pre-analysis plan and presentation. However, you are free to use any other template you prefer or even write your own.

6 Office Hours

I am very flexible with office hours, but it is easier to contact me via email. Feel free to send me a message any time at `danilo.freire@emory.edu`, and I will likely reply within a few hours. My office address is in the Psychology and Interdisciplinary Sciences Building, 36 Eagle Row, 4th Floor, room 480. Please email me a couple of days in advance to ensure that no two students book the same time slot.

7 Academic Integrity

Upon every individual who is a part of Emory University falls the responsibility for maintaining in the life of Emory a standard of unimpeachable honour in all academic work. The Honour Code of Emory College is based on the fundamental assumption that every loyal person of the University not only

will conduct his or her own life according to the dictates of the highest honor, but will also refuse to tolerate in others action which would sully the good name of the institution. Academic misconduct is an offense generally defined as any action or inaction which is offensive to the integrity and honesty of the members of the academic community. The typical sanction for a violation of the Emory Honor Code is an F in the course. Any suspected case of academic misconduct will be referred to the Emory Honour Council.

8 Artificial Intelligence

Students have to submit a series of problem sets and complete two group projects. You are encouraged to use AI to assist with your assignments, as learning to use AI is a valuable and emerging skill. I am available to provide support and assistance with these tools during office hours or by appointment. However, please note that any errors or omissions resulting from the use of AI tools are your responsibility. Do not rely solely on AI to complete your assignments; you must always double-check your work. Remember to cite all sources used in your problem sets and projects, including AI tools. Please include a note at the end of any document indicating that AI was used in its development.

9 Special Needs and Accessibility Services

I am fully committed to providing the necessary accommodations to ensure that all students have an equal opportunity to succeed in this course. Students with medical/health conditions that might impact academic success should visit the Department of Accessibility Services (DAS) to determine eligibility for appropriate accommodations. Students who receive accommodations should contact me with an Accommodation Letter from the DAS at the beginning of the semester, or as soon as the accommodation is granted. If you wish to do so, feel free to request an individual meeting to further discuss the specific accommodations.

10 English Language Learners

Emory University welcomes students from around the country and the world, and the unique perspectives international and multilingual students bring enrich the campus community. To empower multilingual learners, an array of support is available including language and culture workshops and individual appointments. For more information about English Language Learning support at Emory, please contact the ELLP Specialists at https://writingcenter.emory.edu. No student will be penalised for their command of the English language.

11 Assignments and Grading Policy

Problem Sets: 50%. There will be ten problem sets throughout the course, each focusing on different aspects of experimental design and analysis. These assignments are designed to reinforce concepts covered in lectures and readings, and to provide hands-on practice with experimental design techniques. Problem sets will include a mix of theoretical questions and practical applications. They will be assigned regularly and must be completed individually. You may discuss your work with other colleagues as long as you do not copy entire sentences, just changing a few words. If you worked with other students, please write down their names on your problem set. Please also acknowledge any sources you used in your work, including textbooks, articles, and AI resources.

Pre-Analysis Plan (PAP): 20%. Students will work in groups to develop a pre-analysis plan for an experimental study. The PAP should be written in Quarto and include the following components:

- Research question and hypotheses
- Experimental design and randomisation procedure
- Sample size and power calculations
- Primary and secondary outcome measures
- Detailed analysis plan, including statistical models and robustness checks
- Plan for handling issues such as missing data, non-compliance issues, and attrition

A guide for writing the PAP will be available in the course GitHub repository and webpage. This

assignment will help students develop skills in planning and pre-registering experiments, a crucial practice in modern experimental research.

Final Project: 30%. The final project will consist of a short presentation, created using Quarto, based on the pre-analysis plans developed earlier in the course. For this assignment, I will simulate data based on each group's PAP, intentionally introducing challenges such as missing data on covariates and non-compliance. Students will need to analyse this simulated data as if it were the true results of their proposed experiments, addressing any issues that arise in light of their original PAP. The presentation should include:

- A brief overview of the experimental design.
- Results of the primary and secondary analyses.
- Discussion of how deviations from the PAP were handled.
- Interpretation of results and their implications.
- Reflections on the challenges encountered and lessons learned.

This project will assess students' ability to apply their knowledge of experimental design in a realistic scenario, adapting to unexpected challenges that often arise in real-world research.

Please submit all assignments in PDF format via Canvas before class (include your code). Work submitted late will be penalised by one letter grade every 24 hours unless discussed with the instructor.

12 Grading Scale

Each student's final grade will be based on the following after rounding up to the nearest point:

Grade	A	A-	B+	B	B-	C	D	F
Range	91%–100%	86%–90%	81%–85%	76%–80%	71%–75%	66%–70%	60%–65%	<60%

13 Materials

The main textbook for this course is:

- Gerber, Alan S., and Donald P. Green. 2012. *Field Experiments: Design, Analysis, and Interpretation.* New York: W.W. Norton. (Referred to as FEDAI in the syllabus)

Students should closely read the assigned chapters and papers prior to the course date for which they are assigned. FEDAI will serve as our primary reference throughout the course.

This book is available:

- On course reserves at Robert W. Woodruff Library
- For purchase at the campus bookstore
- Online through retailers like Amazon

Additional readings will be provided through the course website or the library's electronic resources.

Students are encouraged to make use of the library's resources, including its research guides and citation tools, to support their work in this course.

14 Subject to Change Policy

While I will try to adhere to the course schedule as much as possible, I also want to adapt to your learning pace and style. The syllabus and course plan may change in the semester. Again, please visit the course website regularly to check for updates. I will also announce any changes in class and via email.

15 Course Outline and Readings

It is important to read the required materials before class. Please feel free to engage in critical discussions and express your views openly. Bringing notes to class is recommended so we can discuss the topics you find most interesting together. The weekly suggested readings are optional and recommended for those who want to deepen their understanding of the course topics. They are usually more theoretical and maths-intensive than the required readings, but do not feel intimidated by them. They are there to provide a broader perspective on the topics we will cover in class.

15.1 Week 01: Introduction and Course Overview

15.1.1 Lecture 01: Introduction to Experimental Design

Required readings:

- Syllabus and course website: `http://danilofreire.github.io/qtm385`.
- GitHub repository: `https://github.com/danilofreire/qtm385`.
- Lecture slides: Welcome to QTM 385: Introduction / Why Experiments?
- FEDAI: Chapter 01: Introduction.

Weekly suggested readings:

- Druckman, J. N., Green, D. P., Kuklinski, J. H., & Lupia, A. (2011). Experiments: An Introduction to Core Concepts. In J. N. Druckman, D. P. Green, J. H. Kuklinski, & A. Lupia (Eds.), Cambridge Handbook of Experimental Political Science (pp. 19-41). Cambridge University Press.
- Hernán, M. A. (2018). The C-Word: Scientific Euphemisms Do Not Improve Causal Inference from Observational Data. American Journal of Public Health, 108(5), 616-619.
- Mize, T. D., & Manago, B. (2022). The Past, Present, and Future of Experimental Methods in the Social Sciences. Social Science Research, 108, 1-24.
- Bothwell, L. E., Greene, J. A., Podolsky, S. H., & Jones, D. S. (2016). Assessing the Gold Standard — Lessons from the History of RCTs. New England Journal of Medicine, 374(22), 2175-2181.
- Bhatt, A. (2010). Evolution of Clinical Research: A History Before and Beyond James Lind. Perspectives in Clinical Research, 1(1), 6-10.
- Deaton, A., & Cartwright, N. (2018). Understanding and Misunderstanding Randomized Controlled Trials. Social Science & Medicine 210, 2-21.

15.2 Week 02: The Research Design Process

15.2.1 Lecture 02: Theories and Experiments

Required readings:

- Lecture slides: The Research Design Process: Testing Theories with Experiments.

- Blair, G., Cooper, J., Coppock, A., & Humphreys, M. (2019). Declaring and Diagnosing Research Designs. American Political Science Review, 113(3), 838-859.
- Card, D., DellaVigna, S., & Malmendier, U. (2011). The Role of Theory in Field Experiments. Journal of Economic Perspectives, 25(3), 39-62.
- Problem Set 01 assigned.

15.2.2 Lecture 03: When Experiments are Not Possible

- Lecture slides: Natural and Quasi-Experiments.
- Dunning, T. (2012). Natural Experiments in the Social Sciences: A Design-Based Approach. Cambridge University Press. Chapter 01: Introduction.
- Petticrew, M., Cummins, S., Ferrell, C., Findlay, A., Higgins, C., Hoy, C., … & Sparks, L. (2005). Natural Experiments: An Underused Tool for Public Health?. Public Health, 119(9), 751-757.

Weekly suggested readings:

- Dunning, T. (2016). Transparency, Replication, and Cumulative Learning: What Experiments Alone Cannot Achieve. Annual Review of Political Science, 19(1), 541-563.
- Glanz, K., & Bishop, D. B. (2010). The Role of Behavioral Science Theory in Development and Implementation of Public Health Interventions. Annual Review of Public Health, 31(1), 399-418.
- Sell, J. (2018). Definitions and the Development of Theory in Social Psychology. Social Psychology Quarterly, 81(1), 8-22.
- Walker, H. A., & Cohen, B. P. (1985). Scope Statements: Imperatives for Evaluating Theory. American Sociological Review, 50(3), 288–301.
- Banerjee, A. V., & Duflo, E. (2009). The Experimental Approach to Development Economics. Annual Review of Economics 1(1), 151-178.
- Bonell, C., Fletcher, A., Morton, M., Lorenc, T., & Moore, L. (2012). Realist Randomised Controlled Trials: A New Approach to Evaluating Complex Public Health Interventions. Social Science & Medicine, 75(12), 2299-2306.

15.3 Week 03: Potential Outcomes Framework

15.3.1 Lecture 04: Causal Inference and Potential Outcomes

Required readings:

- Lecture slides: Potential Outcomes Framework.
- FEDAI: Chapter 02: Causal Inference and Experimentation.
- Rubin, D. B. (2005). Causal Inference using Potential Outcomes: Design, Modeling, Decisions. Journal of the American Statistical Association, 100(469), 322-331.
- Problem Set 01 due.
- Problem Set 02 assigned.

15.3.2 Lecture 05: Selection Bias and Randomisation

Required readings:

- Lecture slides: Selection Bias and Randomisation.
- Angrist, J. D., & Pischke, J. S. (2014). Mastering 'Metrics: The Path from Cause to Effect. Princeton University Press. Chapter 01: Randomized Trials. The appendix is worth reading as well.
- Hernán, M. A., Hernández-Díaz, S., & Robins, J. M. (2004). A Structural Approach to Selection Bias. Epidemiology, 15(5), 615-625.
- Problem Set 02 assigned.
- Problem Set 01 due.

Weekly suggested readings:

- Imbens, G. W., & Rubin, D. B. (2015). Causal Inference for Statistics, Social, and Biomedical Sciences: An Introduction. Cambridge University Press. Part I - Introduction.
- Hernán M.A. & Robins J.M. (2020). Causal Inference: What If. Boca Raton: Chapman & Hall/CRC. Chapters 6-10. Maths-heavy but very insightful.
- Morgan, S. L., & Winship, C. (2015). Counterfactuals and Causal Inference: Methods and Principles for Social Research. Cambridge University Press. Chapter 02: Counterfactuals and Potential Outcomes Model.

- Holland, P. W. (1986). Statistics and Causal Inference. Journal of the American Statistical Association, 81(396), 945-960.

15.4 Week 04: Sampling Distribution and Randomisation Inference

15.4.1 Lecture 06: Statistical Inference for Randomised Experiments

- FEDAI: Chapter 03: Sampling Distributions, Statistical Inference, and Hypothesis Testing.
- EGAP Methods Guides: Hypothesis Testing, Randomisation Inference, and Cluster Randomisation. These short guides provide a good overview of the topics we will cover in class, as well as example code in R.
- Problem Set 03 assigned.
- Problem Set 02 due.

15.4.2 Lecture 07: Texts for discussion

- Kalla, J. & D. Broockman. 2016. Campaign Contributions Facilitate Access to Congressional Officials: A Randomized Field Experiment. American Journal of Political Science, 60(3): 545–558
- Chattopadhyay, R., & Duflo, E. (2004). Women as policy makers: Evidence from a randomized policy experiment in India. Econometrica, 72(5), 1409-1443.
- Shrout, P. E., & Rodgers, J. L. (2018). Psychology, science, and knowledge construction: Broadening perspectives from the replication crisis. Annual Review of Psychology, 69(1), 487-510.

Weekly suggested readings:

- Imbens, G. W., & Rubin, D. B. (2015). Causal Inference for Statistics, Social, and Biomedical Sciences: An Introduction. Cambridge University Press. Part II - Randomised Experiments.
- Casella, G., & Berger, R. (2024). Statistical inference. CRC Press. More advanced but very comprehensive.
- Berry, C. R., & Fowler, A. (2021). Leadership or luck? Randomization inference for leader effects in politics, business, and sports. Science advances, 7(4), eabe3404.

- Caughey, D., Dafoe, A., Li, X., & Miratrix, L. (2023). Randomisation inference beyond the sharp null: bounded null hypotheses and quantiles of individual treatment effects. Journal of the Royal Statistical Society Series B: Statistical Methodology, 85(5), 1471-1491.

15.5 Week 05: Blocking, Covariate Adjustment, and Statistical Power

15.5.1 Lecture 08: Blocking and Covariate Adjustment

- Lecture slides: Blocking and Covariate Adjustment.
- FEDAI: Chapter 04: Using Covariates in Experimental Design and Analysis
- Problem Set 04 assigned.
- Problem Set 03 due.

15.5.2 Lecture 09: Statistical Power and Sample Size Calculations

- Lecture slides: Statistical Power and Sample Size Calculations.
- FEDAI Appendix 3.1 on Power
- EGAP Methods Guide on Power Calculations.

Weekly suggested readings:

- R Psychology. (2023). Understanding Statistical Power and Significance Testing. A comprehensive guide to power analysis in `R`.
- EGAP: Power Calculator. An interactive tool to calculate power for your experiments.
- Pek, J., Hoisington-Shaw, K. J., & Wegener, D. T. (2024). Uses of uncertain statistical power: Designing future studies, not evaluating completed studies. Psychological Methods.
- Li, X., & Ding, P. (2020). Rerandomization and regression adjustment. Journal of the Royal Statistical Society Series B: Statistical Methodology, 82(1), 241-268.

15.6 Week 06: Non-Compliance and Attrition

15.6.1 Lecture 10: Non-Compliance I

- Lecture slides: Non-Compliance I

- FEDAI: Chapter 05: One-Sided Non-Compliance.
- Problem Set 05 assigned.
- Problem Set 04 due.

15.6.2 Lecture 11: Non-Compliance II

- Lecture slides: Non-Compliance II.
- FEDAI: Chapter 06: Two-Sided Non-Compliance.

Weekly suggested readings:

- Angrist, J. D., Imbens, G. W., & Rubin, D. B. (1996). Identification of Causal Effects Using Instrumental Variables. Journal of the American Statistical Association, 91(434), 444-455.
- Angrist, J. D., & Pischke, J. S. (2009). Mostly Harmless Econometrics: An Empiricist's Companion. Princeton University Press. Chapter 4: Instrumental Variables Estimation.
- Baryakova, T.H., Pogostin, B.H., Langer, R. et al. Overcoming barriers to patient adherence: the case for developing innovative drug delivery systems. Nature Reviews Drug Discovery 22, 387–409 (2023).
- Gerber, A. S., Green, D. P., Kaplan, E. H., & Kern, H. L. (2010). Baseline, placebo, and treatment: Efficient estimation for three-group experiments. Political Analysis, 18(3), 297-315.

15.7 Week 07: Attrition and Ethics in Experimental Research

15.7.1 Lecture 12: Attrition and Missing Data

- Lecture slides: Attrition and Missing Data.
- FEDAI: Chapter 07: Attrition.
- Lo, A., Renshon, J., & Bassan-Nygate, L. (2024). A Practical Guide to Dealing with Attrition in Political Science Experiments. Journal of Experimental Political Science, 11(2), 147-161.
- Problem Set 06 assigned.
- Problem Set 05 due.

15.7.2 Lecture 13: Ethical Considerations in Experimental Research

Required readings:

- Humphreys, M. (2015). Reflections on the ethics of social experimentation. Journal of Globalization and Development, 6(1), 87-112.
- Cronin-Furman, K., & Lake, M. (2018). Ethics abroad: Fieldwork in fragile and violent contexts. PS: Political Science & Politics, 51(3), 607-614.

Weekly suggested readings:

- Zhou, H., & Fishbach, A. (2016). The pitfall of experimenting on the web: How unattended selective attrition leads to surprising (yet false) research conclusions. Journal of personality and social psychology, 111(4), 493.
- Coppock, A., Gerber, A. S., Green, D. P., & Kern, H. L. (2017). Combining double sampling and bounds to address nonignorable missing outcomes in randomized experiments. Political Analysis, 25(2), 188-206.
- Asiedu, E., Dean, E., Karlan, D., & Osei, R. (2021). Ethics and society review: Ethics reflection as a precondition to research funding. Proceedings of the National Academy of Sciences, 118(52), e2117261118.
- ASAB Ethical Committee/ABS Animal Care Committee. (2024). Guidelines for the ethical treatment of nonhuman animals in behavioural research and teaching. Animal Behaviour, 207, I-XI.

15.8 Week 08: Quarto and Pre-Analysis Plans

15.8.1 Lecture 14: Introduction to Quarto

- Lecture slides: Introduction to Quarto.
- Quarto official website: `https://quarto.org/`.
- Problem Set 07 assigned.
- Problem Set 06 due.

15.8.2 Lecture 15: Writing Pre-Analysis Plans

- Lecture slides: How to Write a Pre-Analysis Plan.
- EGAP: Pre-Analysis Plans.
- Olken, B. A. (2015). Promises and perils of pre-analysis plans. Journal of Economic Perspectives, 29(3), 61-80.

Weekly suggested readings:

- Quarto official website.
- Awesome Quarto: `https://github.com/mcanouil/awesome-quarto`. Note: this repository contains dozens of tutorials, examples, and resources.
- Çetinkaya-Rundel, M. & Lowndes, J. S. (2022) Keynote talk: Hello Quarto: Share • Collaborate • Teach • Reimagine. Slides and source code. This is one of the nicest Quarto presentations I have seen.
- Getting Started with Quarto (YouTube). Note: Posit (formerly RStudio) has a series of tutorials on Quarto on their YouTube channel. You can find their playlist here.
- Nosek, B.A., Alter, G., Banks, G.C., Borsboom, D., Bowman, S.D., Breckler, S.J., Buck, S., Chambers, C.D., Chin, G., Christensen, G. and Contestabile, M., 2015. Promoting an open research culture. Science, 348(6242), pp.1422-1425.

15.9 Week 09: Interference

15.9.1 Lecture 16: Interference in Experiments

- Lecture slides: Interference in Experiments.
- FEDAI: Chapter 08: Interference between Experimental Units.
- EGAP: Spillovers.
- Problem Set 08 assigned.
- Problem Set 07 due.

15.9.2 Lecture 17: Texts for discussion

- Centola, D. (2010). The spread of behavior in an online social network experiment. Science, 329(5996), 1194-1197.
- Paluck, B. L., Shepherd, H., and Aronow, P. 2016. Changing climates of conflict: A social network experiment in 56 schools. Proceedings of the National Academy of Sciences, 113(3): 566-571
- Gerber, A. S., & Green, D. P. (2000). The effects of canvassing, telephone calls, and direct mail on voter turnout: A field experiment. American Political Science Review, 94(3), 653-663.

Weekly suggested readings:

- Athey, Susan, and Guido W. Imbens (2017a). The Econometrics of Randomized Experiments. In Handbook of Economic Field Experiments, vol. 1 (E. Duflo and A. Banerjee, eds.)
- Bowers, Jake, Mark M. Fredrickson, and Costas Panagopoulos (2013). Reasoning about Interference Between Units: A General Framework. Political Analysis 21: 97–124.
- Sinclair, Betsy, Margaret McConnell, and Donald P. Green (2012). Detecting Spillover Effects: Design and Analysis of Multilevel Experiments. American Journal of Political Science 56: 1055–1069.

15.10 Week 10: Heterogeneous Treatment Effects

15.10.1 Lecture 18: Heterogeneous Treatment Effects

- Lecture slides: Heterogeneous Treatment Effects.
- FEDAI: Chapter 09: Heterogeneous Treatment Effects
- Problem Set 09 assigned.
- Problem Set 08 due.

15.10.2 Lecture 19: Texts for discussion

- Munshi, K. (2003). Networks in the modern economy: Mexican migrants in the US labor market. The Quarterly Journal of Economics, 118(2), 549-599.

- Miguel, E., & Kremer, M. (2004). Worms: identifying impacts on education and health in the presence of treatment externalities. Econometrica, 72(1), 159-217.
- TBD

Weekly suggested readings:

- Ding, P., Feller, A., & Miratrix, L. (2016). Randomization inference for treatment effect variation. Journal of the Royal Statistical Society Series B: Statistical Methodology, 78(3), 655-671.
- Imai, K., & Ratkovic, M. (2013). Estimating treatment effect heterogeneity in randomized program evaluation. Annals of Applied Statistics, 7(1), 443-470.
- Wager, S., & Athey, S. (2018). Estimation and inference of heterogeneous treatment effects using random forests. Journal of the American Statistical Association, 113(523), 1228-1242.

15.11 Week 11: Mediation and Survey Experiments

15.11.1 Lecture 20: Mediation Analysis

- Lecture slides: Mediation Analysis.
- FEDAI: Chapter 10: Mediation.
- Problem Set 10 assigned.
- Problem Set 09 due.

15.11.2 Lecture 21: Survey Experiments

- Lecture slides: Survey Experiments.
- EGAP: Survey Experiments.
- Sniderman, P. M. (2018). Some advances in the design of survey experiments. Annual Review of Political Science, 21(1), 259-275.
- Problem Set 10 due.

Weekly suggested readings:

- VanderWeele, T. J. (2016). Mediation analysis: a practitioner's guide. Annual review of public health, 37(1), 17-32.

- MacKinnon, D. P., Fairchild, A. J., & Fritz, M. S. (2007). Mediation analysis. Annu. Rev. Psychol., 58(1), 593-614.
- Zhao, X., Lynch Jr, J. G., & Chen, Q. (2010). Reconsidering Baron and Kenny: Myths and truths about mediation analysis. Journal of consumer research, 37(2), 197-206.
- Kane, J. V. (2024). More than meets the ITT: A guide for anticipating and investigating nonsignificant results in survey experiments. Journal of Experimental Political Science, 1-16.
- Schneider, D., & Harknett, K. (2022). What's to like? Facebook as a tool for survey data collection. Sociological Methods & Research, 51(1), 108-140.

15.12 Week 12: Discussions

15.12.1 Lecture 22: Texts for discussion

- Druckman, J. N., Gilli, M., Klar, S., & Robison, J. (2015). Measuring drug and alcohol use among college student-athletes. Social Science Quarterly, 96(2), 369-380.
- Freire, D., & Skarbek, D. (2023). Vigilantism and institutions: Understanding attitudes toward lynching in Brazil. Research & Politics, 10(1), 20531680221150389.
- TBD

15.12.2 Lecture 23: Discussion of Final Projects

- Roundtable on pre-analysis plans (no readings required)

Weekly suggested readings:

- Aronow, Peter M., Alexander Coppock, Forrest W. Crawford, and Donald P. Green. Combining list experiment and direct question estimates of sensitive behavior prevalence. Journal of Survey Statistics and Methodology 3, no. 1 (2015): 43-66.
- Traunmüller, R., Kijewski, S., & Freitag, M. (2019). The silent victims of sexual violence during war: Evidence from a list experiment in Sri Lanka. Journal of Conflict Resolution, 63(9), 2015-2042.

- Coppock, A., & McClellan, O. A. (2019). Validating the demographic, political, psychological, and experimental results obtained from a new source of online survey respondents. Research & politics, 6(1), 2053168018822174.

15.13 Week 13: Meta-Analysis

15.13.1 Lecture 24: Meta-Analysis

- Lecture slides: Meta-Analysis.
- FEDAI: Chapter 11: Integration of Research Findings.
- EGAP: External Validity.
- Problem Set 10 due.

15.13.2 Lecture 25: Guidelines for Experiments

- Lecture slides: Guidelines for Experiments.
- FEDAI: Chapters 12 and 13.

15.14 Week 14 - Discussion of Final Projects

15.14.1 Lecture 26: Review and Final Project Discussion

- Roundtable on final projects (no readings required)

15.14.2 Lecture 27: Final Project Presentations.