Principles of Social Science Research

The course's main objective is to introduce students to social science research. To do so we will focus on how we use facts and observations to make and evaluate statements about the world and the forces which appear to account for human interactions. What will become quickly evident is that academic discourse and scientific debate is more involved and cumbersome than everyday reasoning.

Over the course of the ten weeks students will learn how to fruitfully use data to make inferences about the world. We will spend a considerable amount of time on various threats to valid inferences and how one can overcome them. The second part of the course is focused on experimental designs, lab, field, and natural experiments. Students will be familiarized with the gold standard for internal validity and will see how we can use such approaches to answer relevant real-world questions.

Rather than providing an in-depth theoretical treatment of these topics this class strives to inspire and enthuse students for the scientific endeavour. A number of practical exercises will help to contextualize some of the more abstract concepts and theories.

Module code	POLS0007
Teaching	One hour lecture, one hour seminar – lectures and seminars are mandatory
Assessment	Midterm essay (1500 words, 50%) and final essay (1500 words, 50%)
Deadlines	Midterm (Nov 2025 TBA), Final (Jan 2026 TBA)
Lecturer	Dr Tobias Rüttenauer (t.ruttenauer@ucl.ac.uk)
Teaching Assistants	Mr Robbie Maris (robert.maris.23@ucl.ac.uk) Mr Sergio Perez Schjetnan (sergio.schjetnan.24@ucl.ac.uk)
Office hours	Tobias Rüttenauer: Tuesday 10am–11am (Online or In-person, upon request) Robbie Maris: Tuesday 2-3pm (Online or In-person, upon request) Sergio Perez Schjetnan: Tuesday 5-6pm (Online or In-person, upon request)
Lecture	Tue 9am–10am: IOE, 20 Bedford Way, 103 - Jeffery Hall,
Seminars	1) Tue 11am–12pm: Tavistock Square (35) G01, R. Maris 2) Tue 12–1pm: Tavistock Square (35) G01, R. Maris 3) Tue 1–2pm: Tavistock Square (35) G01, R. Maris 4) Tue 2–3pm: IOE - Bedford Way (20) W2.05, S. Perez Schjetnan 5) Tue 3–4pm: IOE - Bedford Way (20) W2.05, S. Perez Schjetnan 6) Tue 4–5pm: IOE - Bedford Way (20) W2.05, S. Perez Schjetnan

Part 1: Research: Creating Knowledge

We want to learn about the world and how things work. The endeavor starts with description but we want to move beyond describing the world and start to actually analyze it.
We will first try to better understand what science is and how it can be distinguished from other forms of inquiry. We then will learn how the research process is structured and see a number of examples from different fields (sociology, economics, political science, public health, criminology). By the end of this part students will know what makes a study scientific and will be familiar with the core concepts of an academic argument.

- Week 1: **What is Science? Science is a Method!** We will first start by defining science and then see why the scientific method is so vital to the endeavour of knowledge production. We will also see how various disciplines can be capture under the umbrella of the social sciences.
  Literature:
  - Clark, W. R., Golder, M., and Golder, S. N. (2009). *Principles of Comparative Politics*. CQ Press, Washington, D.C, Chapter 2.

  Seminar Activity: Comparing two articles and contrasting scientific to non-scientific writing.
  - Engzell, P., Frey, A., and Verhagen, M. D. (2021). Learning loss due to school closures during the COVID-19 pandemic. *Proceedings of the National Academy of Sciences of the United States of America*, 118(17):1–7 `https://www.youtube.com/watch?v=Yhuv1yJrdC4`
  - Harford, Tim. 2021. "The hard lessons of home schooling". *Financial Times* (18.02.2021).

- Week 2: **Social Science Research and Basic Concepts.** This week will introduce students to basic concepts of science, scientific method, and the scientific process. We will discuss how we can test theories.
  Literature:
  - **All:** Kellstedt, P. M. (2018). *The Fundamentals of Political Science Research*. Cambridge University Press, New York, 3rd ed edition. Chapters 1–3.
  - Students will be assigned one of the four texts (SSDS: norms, PPE: politics, PH: health, G: crime):
    * **Norms and Social Disorder:** Keizer, K., Lindenberg, S., and Steg, L. (2008). The Spreading of Disorder. *Science*, 322(5908):1681–1685.
    * **Political Preferences:** Bartels, L. M. (2005). Homer Gets a Tax Cut: Inequality and Public Policy in the American Mind. *Perspectives on Politics*, 3(01).
    * **Child Health and Cash Transfers:** Guanais, F. C. (2015). The Combined Effects of the Expansion of Primary Health Care and Conditional Cash Transfers on Infant Mortality in Brazil, 1998–2010. *American Journal of Public Health*, 105(S4):S593–S599.
    * **Crime Drop and Abortions:** Levitt, S. D. and Dubner, S. J. (2009). *Freakonomics: A Rogue Economist Explores the Hidden Side of Everything*. Harper Perennial, New York, 1. harper perennial edition edition, Chapter 4, "Where Have All the Criminals Gone?" New York: Harper Collins.

  Seminar Activity: We will analyze the articles of this week and identify the theory, main argument, independent variable, control variable, dependent variable, potential problems, and the main finding.

Part 2: Threats to Inference

Designing a good study is hard work. At first glance many studies may appear to be very convincing but only after we think very hard about possible problems that doubts may arise.
Luckily for us, a lot of these threats reoccur and can be grouped together. We will discuss a number of the most common and severe problems for social science research. Keywords: Self-selection, omitted variable bias, simultaneity, and reverse causality.

- Week 3: **Threats to valid inferences 1: Internal and External Validity.** Experimental designs. Implications for internal validity (what internal validity is and why experimental design is ideal). Implications for external validity (what external validity is and why experimental design may not always be ideal).
  Literature:
  - Kellstedt, P. M. (2018). *The Fundamentals of Political Science Research*. Cambridge University Press, New York, 3rd ed edition, Chapters 4.1 and 4.2.

  Seminar Activity: We will analyze this article and describe the idea behind the experimental design, identify internal and external validity issues, potential problems, and the main findings.
  - Aalen, L., Kotsadam, A., Pieters, J., and Villanger, E. (2024). Jobs and Political Participation: Evidence from a Field Experiment in Ethiopia. *The Journal of Politics*, 86(2):656–671

- Week 4: **Threats to valid inferences 2: Omitted variable bias & Self-selection.** What happens when we omit a crucial factor? What are the consequences of studying human behavior – what happens when subjects respond to incentives?
  Literature:
  - King, G., Keohane, R. O., and Verba, S. (2021). *Designing Social Inquiry: Scientific Inference in Qualitative Research*. Princeton University Press, Princeton, New Jersey, new edition edition,Chapters 4.2, 4.3, 5.2.

  Seminar Activity: We will analyze this article and discuss possible situations of 'selection on the dependent variable', 'selection on the independent variable', 'self-selection', and 'omitted variable bias'.
  - Abascal, M. and Baldassarri, D. (2015). Love Thy Neighbor? Ethnoracial Diversity and Trust Reexamined. *American Journal of Sociology*, 121(3):722–782

- Week 5: **Threats to valid inferences 3: measurement error, simultaneity and reverse causality.** What if X affects Y, but Y also affects X?
  Literature:
  - Kellstedt, P. M. (2018). *The Fundamentals of Political Science Research.* Cambridge University Press, New York, 3rd ed edition, Chapter 5.2.

  Seminar Activity: We will analyze this article, identify causal inference problems, and potential solutions.
  - Chetty, R., Jackson, M. O., Kuchler, T., Stroebel, J., Hendren, N., Fluegge, R. B., Gong, S., Gonzalez, F., Grondin, A., Jacob, M., Johnston, D., Koenen, M., Laguna-Muggenburg, E., Mudekereza, F., Rutter, T., Thor, N., Townsend, W., Zhang, R., Bailey, M., Barberá, P., Bhole, M., and Wernerfelt, N. (2022). Social Capital I: Measurement and Associations with Economic Mobility. *Nature*, 608(7921):108–121.

MIDTERM EXAM: Students will be asked to read an article and assess the various correlations and discuss potential problems to causal inference. The purpose is to critically assess causal claims based on what has been covered during the first five weeks.
This 1,500 word essay is due on TBA (November 2025).

Part 3: Why Flipping a Coin Is the Silver Bullet

One of the most powerful ideas in history is randomization. It goes back to as far as the 17th century when the Belgian physician Van Helmont argued that one should randomly create two groups and treat one (the treatment was bloodletting) while the other group would be untreated. Van Helmont was convinced that we could thereby learn whether bloodletting was an effective treatment or not. R.A. Fisher published a highly influential book in 1935, while a professor at UCL, entitled "The Design of Experiments".
We will see how randomization allows us to take care many problems related to internal validity. We will start with laboratory experiments and then look at field experiments. The end of this part is devoted to natural experiments and ethical questions in research.

- Week 6: **The Potential Outcome Framework, Experiments, and Randomization.** This week introduces the potential outcome framework and the fundamental problem of causal inference. We will then discuss how randomization may help solve the causal inference problem. We also discuss questions of internal and external validity and lab experiments.
  Literature:
  - Angrist, J. D. and Pischke, J.-S. (2015). *Mastering 'Metrics: The Path from Cause to Effect.* Princeton Univ. Press, Princeton, Chapter 1 "Randomized Trials".

  Seminar Activity: Potential outcome framework will be applied to the articles below, and internal and external validity issues will be discussed.
  - Fehr, E. and Gächter, S. (2002). Altruistic Punishment in Humans. *Nature*, 415:137–140.
  - Williamson, S., Adida, C. L., Lo, A., Platas, M. R., Prather, L., and Werfel, S. H. (2021). Family Matters: How Immigrant Histories Can Promote Inclusion. *American Political Science Review*, 115(2):686–693.

- Week 7: **Field Experiments.** Most of the questions social scientists study cannot be optimally tested in a laboratory. Field experiments allow researchers to apply large scale experiments in the real world. We will also discuss potential problems that may arise in conducting a field experiment.
  Literature:
  - Gerber, A. S. and Green, D. P. (2012). *Field Experiments: Design, Analysis, and Interpretation.* W. W. Norton, New York, 1st ed. edition, Chapter 1.

  Seminar Activity: Evaluate two field experiments below, discuss issues of internal and external validity. What sort of political intervention would you design based on those results?
  - Porter, C. and Serra, D. (2020). Gender Differences in the Choice of Major: The Importance of Female Role Models. *American Economic Journal: Applied Economics*, 12(3):226–254.
  - Bond, R. M., Fariss, C. J., Jones, J. J., Kramer, A. D. I., Marlow, C., Settle, J. E., and Fowler, J. H. (2012). A 61-Million-Person Experiment in Social Influence and Political Mobilization. *Nature*, 489(7415):295–298.

A crucial question in field experiments is weather participants in our treatment group actually experience the treatment. For a detailed discussion about the differences between ATT and ITT based on one of the biggest field experiments ever conducted, see:

- Ludwig, J., Liebman, J. B., Kling, J. R., Duncan, G. J., Katz, L. F., Kessler, R. C., and Sanbonmatsu, L. (2008). What Can We Learn about Neighborhood Effects from the Moving to Opportunity Experiment? *American Journal of Sociology*, 114(1):144–188.

Identifying a causal effect does not directly imply optimal policy. For an interesting example see:

- Carrell, S. E., Sacerdote, B. I., and West, J. I. (2013). From Natural Variation to Optimal Policy? The Importance of Endogenous Peer Group Formation. *Econometrica*, 81(3):855–882.

- Week 8: **Natural Experiments.** Once in a while there is a unique opportunity for researchers when something happens that can be regarded as if it was fully at random. These rare events can be leveraged to find causal effects.
  Literature:

  - Dunning, T. (2012). *Natural Experiments in the Social Sciences: A Design-Based Approach*. Cambridge University Press, first edition.

  Seminar Activity: Students will work in small groups on a potential field experiment. The goal is to establish an interesting research question and a strategy to answer it by implementing a field experiment. Two examples for natural experiments:

  - Martén, L., Hainmueller, J., and Hangartner, D. (2019). Ethnic Networks Can Foster the Economic Integration of Refugees. *Proceedings of the National Academy of Sciences of the United States of America*, 116(33):16280–16285.
  - Kirk, D. S. (2009). A Natural Experiment on Residential Change and Recidivism: Lessons from Hurricane Katrina. *American Sociological Review*, 74(3):484–505.

- Week 9: **Research and Society.** Research is not done in a vacuum but is part of most modern societies. We look at a number of ethical and moral issues. What ethical considerations should we take into account when planning an experiment? Why is plagiarism such a problem? And where does publication bias come from? These and similar questions will be answered in this week.
  Literature:

  - Chambliss, D. F. and Schutt, R. K. (2013). *Making Sense of the Social World: Methods of Investigation*. SAGE, Thousand Oaks, 4th ed edition, Chapter 3: Ethics in Research.

  Seminar Activity: We will look at the process of receiving ethics approval for a field experiment. Students will work in small groups on a potential field experiment with special attention to vulnerability of subjects, deception, and potentially harmful interventions. For more information on ethics principles (especially with new data sources) see also:

  - Salganik, M. J. (2018). *Bit by Bit: Social Research in the Digital Age*. Princeton University Press, Princeton, Chapter 6: Ethics. https://www.bitbybitbook.com/en/1st-ed/ethics/

- Week 10: **Review Week and Outlook.** The final week will serve to review the material of the past nine weeks and to provide an outlook to why there are statistics and why we most often model data rather than organize and experiment.
  Literature:
  - Hainmueller, Jens, Dominik Hangartner, and Guiseppe Pietrantuono. 2015. "Naturalization fosters the long-term political integration of immigrants" *Proceedings of the National Academy of Sciences*. Video: https://www.youtube.com/watch?t=547&v=N5mKN2btUfY

  Seminar Activity: Revision session, last chance to ask questions about any part of the past ten weeks that remains unclear.

FINAL EXAM: Students will be asked to write an essay to answer a specific research question. They will be asked to formulate an optimal research design and discuss potential problems. The essay is due on TBA (January 2026).