

SYLLABUS

Course title: EXPERIMENTS: LAB, FIELD, NATURAL & QUASI

Instructors: Prof. Christian PEUKERT & Prof. Isabelle ENGELER
Email: Christian.peukert@unil.ch / Isabelle.Engeler@unil.ch

Course website: Moodle

Semester: Autumn 2023

Timetable:

Thursday from 9:00 to 13:00, Room 3068 (Anthropole)

First class: September 21, 2023.

Credits: 6.0

Prerequisites:

A basic understanding of programming languages and statistics/econometrics is helpful but not required.

Registration procedure:

Sign-up for the course by sending an e-mail to benedicte.moreira@unil.ch

GENERAL DESCRIPTION OF THE COURSE

The objective of this course is to provide students with an understanding of causality in empirical research, and why experiments are so useful to uncover causal relationships. It is tailored for PhD students with an interest in doing research in areas such as behavioral economics, consumer behavior, organizational behavior, strategy and (business) policy evaluation.

We discuss methods for observational data, where the researcher cannot actively design an experiment, but must rely on variation from natural or quasi experiments. We make use of simulation to build an intuition for when these methods work well, and when they are better avoided.

The course further covers the construction of experimental designs in the lab and field, the development of experimental tasks and stimuli, how to avoid confounds and other threats to validity, procedural aspects of administering experiments, and the analysis of experimental data.

We will replicate published research to give you hands-on experience in applying the methods covered in the course.

Sessions are conducted in an interactive seminar format, with extensive discussion of concrete examples, challenges, and solutions.

The course is split into two parts:

1. Natural and quasi experiments (Peukert), sessions 1-7
2. Lab and field experiments (Engeler), sessions 8-14

READINGS

Selected weekly readings (see section “Course Information per Session”)

Textbooks:

- Angrist, J.D. and Pischke, J.S., 2008. Mostly harmless econometrics: An empiricist's companion. Princeton University Press.
- Baum, C.F., 2009. An introduction to Stata programming (Vol. 2). College Station: Stata Press.
- Cunningham, S., 2021. Causal inference: The mixtape. Yale University Press. Also available here: <https://www.scunning.com/mixtape.html>

ASSESSMENTS AND GRADING POLICY

Weekly readings and homework are a prerequisite to passing the course. The final grade consists of two group assignments and two individual assessments.

40% group assignments

- Replication of research articles and presentation (Part 1)
- Empirical replication of a recently published experiment (Part 2)

60% individual assessments

- End of semester open book exam (Part 1)
- In-class discussion and participation of assigned readings (Part 2)

RETAKE ASSESSMENT

Re-examination procedure: Students can redo failed assessments. The resits will be during the official resit examination period. The group class-room assignments can be redone individually, which will be evaluated with an oral presentation. The grade after resits will be calculated on the assessments that are redone along with the assessments that are not redone as per weighting scheme of the original syllabus.

COURSE INFORMATION PER SESSION

Part 1: Natural and quasi experiments (Prof. Christian Peukert)

Session 1 (September 21, 2023): Causality

- Content:
 - Recap of basic concepts in statistics
 - Inference
 - Data generation processes
 - The potential outcome model
 - Linear Regression
 - Why we need experiments and which type to choose when
- Readings/Videos:
 - Angrist and Pischke, Chapters 2-3
 - Cunningham, Chapter 9

Session 2 (September 28, 2023): Introduction to STATA

- Content:
 - Introduction to Stata
 - Data types
 - Basic data manipulation
 - Basic programming: Macros and loops
 - Visualization
- Readings/Videos
 - Baum, C.F., 2009. An introduction to Stata programming (Vol. 2). College Station: Stata Press, Chapters 2-10.
 - There are tons of helpful resources on the internet to learn Stata. Consider watching videos on YouTube. Google will often point you to Statalist for specific problems.
 - Ben Lambert, Monte Carlo Simulation for estimators, An Introduction:
https://www.youtube.com/watch?v=5nM5e2_1OQ0
 - Nick Huntington-Klein, Monte Carlo Simulation in Stata:
<https://www.youtube.com/watch?v=-SKz6EhORqQ>

Session 3 (October 5, 2023): Natural experiments

- Content:
 - Introduction to experiments in observational data
 - Natural experiments
 - **Difference-in-differences**
 - Assumptions
 - Pitfalls
 - Communicating results
- Readings:
 - Angrist and Pischke, Chapter 5
 - Cunningham, Chapter 10
- Replication exercise:
 - Abouk, Rahi, and Scott Adams. 2013. "Texting Bans and Fatal Accidents on Roadways: Do They Work? Or Do Drivers Just React to Announcements of Bans?" American Economic Journal: Applied Economics, 5 (2): 179-99.
 - Moser, Petra, and Alessandra Voena. 2012. "Compulsory Licensing: Evidence from the Trading with the Enemy Act." American Economic Review, 102 (1): 396-427.

Session 4 (October 12, 2023): Natural experiments 2

- Content:
 - o **Synthetic control group**
 - Assumptions
 - Pitfalls
 - Communicating results
- Readings:
 - o Cunningham, Chapter 11
- Replication exercise:
 - o Andersson, Julius J. 2019. "Carbon Taxes and CO₂ Emissions: Sweden as a Case Study." *American Economic Journal: Economic Policy*, 11 (4): 1-30.
 - o Christian Helmers, Henry G. Overman, My Precious! The Location and Diffusion of Scientific Research: Evidence from the Synchrotron Diamond Light Source, *The Economic Journal*, Volume 127, Issue 604, September 2017, Pages 2006–2040

Session 5 (October 19, 2023): Natural experiments 3

- Content:
 - o **Regression discontinuity**
 - Assumptions
 - Pitfalls
 - Communicating results
- Readings:
 - o Angrist and Pischke, Chapter 6
 - o Cunningham, Chapter 7
- Replication exercise:
 - o Bento, Antonio, Daniel Kaffine, Kevin Roth, and Matthew Zaragoza-Watkins. 2014. "The Effects of Regulation in the Presence of Multiple Unpriced Externalities: Evidence from the Transportation Sector." *American Economic Journal: Economic Policy*, 6 (3): 1-29.
 - o Nekoei, Arash, and Andrea Weber. 2017. "Does Extending Unemployment Benefits Improve Job Quality?" *American Economic Review*, 107 (2): 527-61.

Session 6 (October 26, 2023): Quasi experiments 1

- Content:
 - o **Matching**
 - Exact matching, propensity score matching
 - Assumptions
 - Pitfalls
 - Communicating results
- Readings:
 - o Cunningham, Chapter 6
- Replication exercise:
 - o Blaseg, D., Schulze, C. and Skiera, B., 2020. Consumer protection on Kickstarter. *Marketing Science*, 39(1), pp.211-233.
 - o He, S., Hollenbeck, B. and Proserpio, D., 2022. The market for fake reviews. *Marketing Science*.

Session 7 (November 2, 2023): Quasi experiments 2

- Content:
 - **Selection models**
 - Assumptions
 - Pitfalls
 - Communicating results
 - **Instrumental variables**
 - Assumptions
 - Pitfalls
 - Communicating results
- Readings:
 - Angrist and Pischke, Chapter 4
- Replication exercise:
 - Clark, Damon, and Emilia Del Bono. “The Long-Run Effects of Attending an Elite School: Evidence from the United Kingdom.” *American Economic Journal: Applied Economics* 8, no. 1 (January 2016): 150–76.
 - Draca, Mirko, Stephen Machin, and Robert Witt. “Panic on the Streets of London: Police, Crime, and the July 2005 Terror Attacks.” *American Economic Review* 101, no. 5 (August 2011): 2157–81.

Part 2: Lab and field experiments (Prof. Isabelle Engeler)

Session 8 (November 9, 2023): Intro to experimental research

Content:

- Introduction to scientific inquiry
- Why experiments?
- Experimental research process and causal inference
- Reproducibility of experimental research
- Introduction to replication group project / IRB

Required Application Readings:

- O’Donnell, M., Dev, A. S., Antonoplis, S., Baum, S. M., Benedetti, A. H., Brown, N. D., ... & Nelson, L. D. (2021). Empirical audit and review and an assessment of evidentiary value in research on the psychological consequences of scarcity. *Proceedings of the National Academy of Sciences*, 118(44), e2103313118. (→ skim only, you just need to get the gist of what they do and how)

Required Topic Readings:

- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Houghton Mifflin Company. (→ read only p. 1-18, intro to experimental research)
- Nelson, L. D., Simmons, J., & Simonsohn, U. (2018). Psychology's renaissance. *Annual Review of Psychology*, 69, 511-534.
- Brandt, M., IJzerman, H., Dijksterhuis, A., Farach, F., Geller, J., Giner-Sorolla, R., Grange, J., Perugini, M., Spies, J., & Veer, A. (2014). The Replication Recipe: What Makes for a Convincing Replication? *Journal of Experimental Social Psychology*, 50, 217–224.
- Gray, K., & Wegner, D. M. (2013). Six guidelines for interesting research. *Perspectives on Psychological Science*, 8(5), 549-553. (→ skim only)

Optional Topic Readings:

- Nosek, B. A., Spies, J. R., & Motyl, M. (2012). Scientific utopia II: Restructuring incentives and practices to promote truth over publishability. *Perspectives on Psychological Science*, 7(6), 615–631.

Session 9 (November 16, 2023): Design your experiment I

Content:

- Types of experiments: laboratory and field
- Types of experimental designs and paradigms
- Types of variables
- Main effect studies

Required Application Readings:

- Engeler, I., & Barasz, K. (2021). From Mix-and-Match to Head-to-Toe: How Brand Combinations Affect Observer Trust. *Journal of Consumer Research*, 48(4), 562-585.
(→ read Intro, conceptual framework, and studies 1A-1C and discussion thereof)
- Belmi, P., Jun, S., & Adams, G. S. (2022). The “Equal-Opportunity Jerk” Defense: Rudeness Can Obfuscate Gender Bias. *Psychological Science*, 33(3), 397-411.
(→ skim Intro and Studies 1 and 2 only)
- Milkman, K. L., Gandhi, L., Patel, M. S., Graci, H. N., Gromet, D. M., Ho, H., ... & Duckworth, A. L. (2022). A 680,000-person megastudy of nudges to encourage vaccination in pharmacies. *Proceedings of the National Academy of Sciences*, 119(6), 1-6.
(→ skim only; have a look at the different experimental conditions tested)

Required Topic Readings:

- Christensen, L. (2012). Types of designs using random assignment.
- Falk, A., & Heckman, J. J. (2009). Lab experiments are a major source of knowledge in the social sciences. *Science*, 326(5952), 535-538.
- List, J. A. (2011). Why economists should conduct field experiments and 14 tips for pulling one off. *Journal of Economic Perspectives*, 25(3), 3-16.
- Lonati, S., Quiroga, B. F., Zehnder, C., & Antonakis, J. (2018). On doing relevant and rigorous experiments: Review and recommendations. *Journal of Operations Management*, 64, 19-40.
(→ read chapter 1-3 & 6, skim chapter 4, and skip chapter 5)

Optional Topic Readings:

- Hertwig, R., & Ortmann, A. (2001). Experimental practices in economics: A methodological challenge for psychologists?. *Behavioral and Brain Sciences*, 24(3), 383-403.
- Eden, D. (2017). Field experiments in organizations. *Annual Review of Organizational Psychology and Organizational Behavior*, 4, 91-122.
- Mislavsky, R., Dietvorst, B., & Simonsohn, U. (2020). Critical Condition: People Don't Dislike a Corporate Experiment More Than They Dislike Its Worst Condition. *Marketing Science*, 39(6), 1092–1104. (→ read abstract, skim rest, get the gist)
- Datacolada [85] Data Replicada #4: The Problem of Hidden Confounds <http://datacolada.org/85>
- Datacolada [89] Data Replicada #6: The Problem of (Weird) Differential Attrition <http://datacolada.org/89>

Session 10 (November 23, 2023): Design your experiment II

Content:

- Moderation / Interaction effects
- How do we assess psychological mechanisms?
- How do we assess boundary conditions?
- Preregistration

Required Application Readings:

- Engeler, I., & Barasz, K. (2021). From Mix-and-Match to Head-to-Toe: How Brand Combinations Affect Observer Trust. *Journal of Consumer Research*, 48(4), 562-585.
(→ read studies 2A, 2B, and 3)

Required Topic Readings:

- Spiller, S. A., Fitzsimons, G. J., Lynch Jr, J. G., & McClelland, G. H. (2013). Spotlights, floodlights, and the magic number zero: Simple effects tests in moderated regression. *Journal of Marketing Research*, 50(2), 277-288.
- Spencer, S., Zanna, S., & Fong, G. (2005). Establishing a causal chain: Why experiments are often more effective than mediational analyses in examining psychological processes. *Journal of Personality and Social Psychology*, 89, 845-851.
- Goldstein, D. (2022). Leveling Up Applied Behavioral Economics. In A. Samson (Ed.), *The Behavioral Economics Guide 2022* (pp. 6-18). <https://www.behavioraleconomics.com/be-guide/>
- Datacolada [17] No-way Interactions <http://datacolada.org/17>

Optional Topic Readings:

- Bullock, J. G., & Green, D. P. (2021). The failings of conventional mediation analysis and a design-based alternative. *Advances in Methods and Practices in Psychological Science*, 4(4), 25152459211047227.
- Van't Veer, A. E., & Giner-Sorolla, R. (2016). Pre-registration in social psychology—A discussion and suggested template. *Journal of Experimental Social Psychology*, 67, 2-12.

Session 11 (November 30, 2023): Set up your experiment

Content:

- Why randomization?
- What are confound?
- Why and how to pre-register?
- Effect size and power

Required Topic Readings:

- Simmons, J., Nelson, L., & Simonsohn, U. (2021). Pre-registration: Why and How. *Journal of Consumer Psychology*, 31(1), 151-162.
- Pham, M. T., & Oh, T. T. (2021). Preregistration is neither sufficient nor necessary for good science. *Journal of Consumer Psychology*, 31(1), 163-176.
- Meyvis, T., & Van Osselaer, S. M. (2018). Increasing the power of your study by increasing the effect size. *Journal of Consumer Research*, 44(5), 1157-1173.
- Landy, J. F., Jia, M. L., Ding, I. L., Viganola, D., Tierney, W., Dreber, A., ... & Ly, A. (2020). Crowdsourcing hypothesis tests: Making transparent how design choices shape research results. *Psychological Bulletin*. 146(5), 451-479.
- Datacolada [33] "The" Effect Size Does Not Exist <http://datacolada.org/33>

Session 12 (December 7, 2023): Run your experiment

Content:

- Data collection
- Introduction to crowd sourcing platforms
- Dos and Don'ts of running experiments
- Visit of HEC-LABEX

Required Topic Readings:

- Zallot, C., Paolacci, G., Chandler, J., & Sisso, I. (2021). Crowdsourcing in observational and experimental research. In *Handbook of Computational Social Science, Volume 2* (pp. 140-157). Routledge.
- Henrich, J., Heine, S. J., & Norenzayan, A. (2010). Most people are not WEIRD. *Nature*, 466(7302), 29-29.

Session 13 (December 14, 2023): Analyze your experiment

Content:

- How to analyze experiments?
- Understanding how to use and interpret p-values
- P-curve analysis
- Primer on meta-analysis

Required Topic Readings:

- Simonsohn, U., Nelson, L. D., & Simmons, J. P. (2014). P-curve: a key to the file-drawer. *Journal of Experimental Psychology: General*, 143(2), 534-547. (→ only read until/without “A Demonstration”)
- Vosgerau, J., Simonsohn, U., Nelson, L. D., & Simmons, J. P. (2019). 99% impossible: A valid, or falsifiable, internal meta-analysis. *Journal of Experimental Psychology: General*, 148(9), 1628-1639.
- Datacolada [55] The file-drawer problem is unfixable, and that's OK <http://datacolada.org/55>
- Vazire, S., Schiavone, S. R., & Bottesini, J. G. (2022). Credibility Beyond Replicability: Improving the Four Validities in Psychological Science. *Current Directions in Psychological Science*, 31(2), 162–168.
- Lakens, D. (2022). Improving Your Statistical Inferences. Retrieved from https://lakens.github.io/statistical_inferences/01-pvalue.html#sec-misconceptions (→ read only chapter 1 “Using p-values to test a hypothesis”)

Optional Topic Readings:

- Cumming, G. (2014). The new statistics: Why and how. *Psychological Science*, 25(1), 7-29.

Session 14 (December 21, 2023): Interpret, report, and present your experiment

Content:

- How to interpret and report experiments?
- How to present experimental results?
- Generalizability of results
- Presentation of replication project results

Required Topic Readings:

- Simonsohn, U. (2015). Small Telescopes: Detectability and the Evaluation of Replication Results. *Psychological Science*, 26(5), 559–569.
- Gernsbacher, M. A. (2018). Writing empirical articles: Transparency, reproducibility, clarity, and memorability. *Advances in Methods and Practices in Psychological Science*, 1(3), 403-414.
- Zhang, S., Heck, P. R., Meyer, M. N., Chabris, C. F., Goldstein, D. G., & Hofman, J. M. (2022). An illusion of predictability in scientific results. *SocArXiv*, preprint, submitted September, 29. <http://jakehofman.com/pdfs/illusion-of-predictability.pdf>
- Larkin, M. (2015). How to give a dynamic scientific presentation. [Link](#)

Optional Topic Readings:

- Highhouse, S. (2009). Designing Experiments That Generalize. *Organizational Research Methods*, 12(3), 554-566.