

## SYLLABUS

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

**Instructors:** Prof. Christian PEUKERT & Prof. Isabelle ENGELER  
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**Course website:** Moodle

**Semester:** Autumn 2022

**Timetable:**

Tuesday from 9:00 to 13:00 – Extranef 110 (except on September 27 – room Géopolis 2227)  
First class: September 20, 2022.

**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](mailto: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 20, 2022): Causality

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

#### Session 2 (September 27, 2022): Introduction to STATA

- Content:
  - o Introduction to Stata
    - Data types
    - Basic data manipulation
    - Basic programming: Macros and loops
    - Visualization
- Readings/Videos
  - o Baum, C.F., 2009. An introduction to Stata programming (Vol. 2). College Station: Stata Press, Chapters 2-10.
  - o 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.
  - o Ben Lambert, Monte Carlo Simulation for estimators, An Introduction:  
[https://www.youtube.com/watch?v=5nM5e2\\_1OQ0](https://www.youtube.com/watch?v=5nM5e2_1OQ0)
  - o Nick Huntington-Klein, Monte Carlo Simulation in Stata:  
<https://www.youtube.com/watch?v=-SKz6EhORqQ>

#### Session 3 (October 4, 2022): Natural experiments

- Content:
  - o Introduction to experiments in observational data
  - o Natural experiments
  - o **Difference-in-differences**
    - Assumptions
    - Pitfalls
    - Communicating results
- Readings:
  - o Angrist and Pischke, Chapter 5
  - o Cunningham, Chapter 10
- Replication exercise:
  - o 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.
  - o 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 11, 2022): Natural experiments 2

- Content:
  - **Synthetic control group**
    - Assumptions
    - Pitfalls
    - Communicating results
- Readings:
  - Cunningham, Chapter 11
- Replication exercise:
  - Andersson, Julius J. 2019. "Carbon Taxes and CO<sub>2</sub> Emissions: Sweden as a Case Study." *American Economic Journal: Economic Policy*, 11 (4): 1-30.
  - 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 18, 2022): Natural experiments 3

- Content:
  - **Regression discontinuity**
    - Assumptions
    - Pitfalls
    - Communicating results
- Readings:
  - Angrist and Pischke, Chapter 6
  - Cunningham, Chapter 7
- Replication exercise:
  - 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.
  - Nekoei, Arash, and Andrea Weber. 2017. "Does Extending Unemployment Benefits Improve Job Quality?" *American Economic Review*, 107 (2): 527-61.

### Session 6 (October 25, 2022): Quasi experiments 1

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

## Session 7 (November 1, 2022): 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 08, 2022): 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 15, 2022): 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)

### 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.
- Hertwig, R., & Ortmann, A. (2001). Experimental practices in economics: A methodological challenge for psychologists?. *Behavioral and Brain Sciences*, 24(3), 383-403.

### Optional Topic Readings:

- 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)

**Session 10 (November 22, 2022): 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>
- Simmons, J., Nelson, L., & Simonsohn, U. (2021). Pre-registration: Why and How. *Journal of Consumer Psychology*, 31(1), 151–162.

## 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 29, 2022): Set up your experiment

### Content:

- What are confounds?
- What is a “good” control condition?
- Sample selection and human participants
- Effect size and power
- Ethical principles and code of conduct
- Dos and Don'ts of setting up experiments

### Required Application Readings:

- Belmi, P., Jun, S., & Adams, G. S. (2022). The “Equal-Opportunity Jerk” Defense: Rudeness Can Obfuscate Gender Bias. *Psychological Science*, 33(3), 397-411. (→ read 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:

- 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.
- 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.
- Henrich, J., Heine, S. J., & Norenzayan, A. (2010). Most people are not WEIRD. *Nature*, 466(7302), 29-29.
- 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.
- Datacolada [33] "The" Effect Size Does Not Exist <http://datacolada.org/33>

### Optional Topic Readings:

- Highhouse, S. (2009). Designing Experiments That Generalize. *Organizational Research Methods*, 12(3), 554-566.
- 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 12 (December 06, 2022): 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.
- 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.

### Session 13 (December 13, 2022): Analyze your experiment

#### Content:

- How to analyze experiments?
- 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>

#### Optional Topic Readings:

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

### Session 14 (December 20, 2022): 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.
- Larkin, M. (2015). How to give a dynamic scientific presentation. [Link](#)