
Experimental Methods

Period. 2023/24 -1 sem.

Class times: 08:30-11:50

Room: 4E4 SR01

Instructor:

Prof. Joachim Vosgerau

Dept. of Mktg. - Room 4-C1-02

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Course description

This course focuses on the fundamental principles of behavioral experimental research, including statistical tests, causal inference, empirical adequacy, and replicability. Experimental data are often analyzed with ANOVA, a special case of regression analysis. We will cover ANOVA in detail, its differences to regression, and non-parametric tests. We will read/discuss methodological papers related to causal inference, replicability, p-hacking, sample size requirements, effect sizes and power issues.

Course Material

Textbook

Navarro, D., & Foxcroft, D. (2022). Learning Statistics with JAMOVI (free download: <https://www.learnstatswithjamovi.com>)

Required Skills/Knowledge/Software

- Statistical analysis: Regression
- JAMOVI, download the statistical package from <https://www.jamovi.org/>
- Watch the JAMOVI tutorial: <https://datalab.cc/jamovi/>
- Download freeware GPower from <http://www.psychologie.hhu.de/arbeitsgruppen/allgemeine-psychologie-und-arbeitspsychologie/gpower.html>

Online Resources used in the Course

- Uri Simonsohn, Joe Simmons, and Leif Nelson: Data Colada (<http://datacolada.org/>)
- Uri Simonsohn, Joe Simmons, and Leif Nelson: p-curve (<http://www.p-curve.com/>)
- Uri Simonsohn: Two-lines test for testing u-shapes: <http://webstimate.org/twolines/>
- Ron Dotsch: Tutorial on Degrees of Freedom (<http://www.rondotsch.nl/degrees-of-freedom/>)
- Pre-registration of experiments, hypotheses, and analyses: AsPredicted (<https://aspredicted.org/>)

- Depository for experimental research: Researchbox (<https://researchbox.org/>)
- Andrew Gelman: Statistical Modeling, Causal Inference, and Social Science (<http://andrewgelman.com/>)

Assessment Methods

Weekly Assignments

In most sessions, you are given a dataset from an experiment that you are asked to analyze. Write-up your analyses and results in journal-style format (like a results-section in an academic journal, together with figures/tables). Submit your write-up and JAMOVI-file.

Assignments will be discussed in subsequent sessions.

Final Assignment

Analyze the data of study 2 in Xu, L., Zhao, S., Cotte, J., & Cui, N. (2023). Cyclical Time Is Greener: The Impact of Temporal Perspective on Pro-Environmental Behavior. *Journal of Consumer Research*. Can reproduce the results reported in the paper? If you had analyzed that data, would you have reported the same analyses/results? What would you conclude you're your analysis? Prepare a couple of PowerPoint slides to present your analyses and results in class.

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|----------------------|-----------|
| Class participation: | 20 points |
| Weekly assignments: | 40 points |
| Final assignment: | 40 points |

Papers to read

- Nelson, L. D., Simmons, J., & Simonsohn, U. (2018). Psychology's renaissance. *Annual Review of Psychology*, 69, 511-534.
- Simmons, J P, Nelson, L D and Simonsohn, U (2011). False-Positive Psychology: Undisclosed Flexibility in Data Collection and Analysis Allows Presenting Anything as Significant. *Psychological Science* 22(11): 1359-1366
- 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.
- Simonsohn, U. (2015). Small telescopes: Detectability and the evaluation of replication results. *Psychological Science*, 26(5), 559-569.
- Simmons, J. P., Nelson, L., & Simonsohn, U. (2021). Pre-registration: Why and how. *Journal of Consumer Psychology*, 31(1), 151-162.
- Zwaan, R. A., Etz, A., Lucas, R. E., & Donnellan, M. B. (2018). Making replication mainstream. *Behavioral and Brain Sciences*, 41.

Tentative schedule

| Class | Date Time | Room | Topic | Homework/Readings |
|-------|--------------------------------------|--------------|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Nov 8 th 8:30 – 12:00 | 4E4 SR01 | The logic of experimentation, hypothesis testing, ANOVA, simple and contrast effects | Download JAMOVI, watch JAMOVI tutorial, read assignment 1 (we will do assignment 1 in class) |
| 2 | Nov 15 th 8:30 – 12:00 | 4E4 SR01 | Factorial designs, interactions, ANOVA and regression, ANCOVA | Assignments 2 & 3 due |
| 3 | Nov 22 nd 8:30 – 12:00 | 4E4 SR01 | Within-subject manipulations and mixed designs | Read Assignment 4 (we will do it in class) Assignment 5 due |
| 4 | Nov 28 th 8:30 – 17:00 | 4E4 SR01 | Effect size, power, and non-parametric tests | Assignment 6 due |
| | | | | Assignment 7 due |
| 5 | Dec 5 th 8:30 – 12:00 | 4E4 SR01 | Thinking about Data Analysis, p-hacking | <u>Read the following papers:</u> Nelson et al. (2018) Simmons, Nelson, and Simonsohn (2011) Simonsohn et al. (2014 <i>JEPG</i>) |
| 6 | Dec 12 th 8:30 – 12:00 | 4E4 SR 01 | Preregistration, replications, meta-analysis | Final Assignment due <u>Read the following papers:</u> Simonsohn (2015) Simmons et al. (2021) Zwaan et al. (2018), read up to p. 13 |

Faculty Bio

Joachim earned his Diplom in Psychology from University of Konstanz, Germany, and my Ph.D. in Marketing from INSEAD, France. From 2005 to 2013 he served on the marketing faculty at the Tepper School of Business at Carnegie Mellon University, where he was also co-director of the Center for Behavioral and Decision Research (CBDR). From 2013 to 2015, Joachim was on the faculty of the Marketing Department at Tilburg University's School of Economics and Management, Netherlands. Since 2015, he is on the marketing faculty of Bocconi University in Milan and serves as director of Bocconi's Experimental Laboratory for the Social Sciences ([BELSS](#)). Joachim's research interests are in the realm of consumer behavior, with a specific interest in decision making and preferences under uncertainty, and research methodology.

