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## Experimental Methods

Period. 2024/25 -1 sem.

Class times: usually 08:30-11:50, see  
attached syllabus

Room: 101

**Instructor:**

Prof. Joachim Vosgerau  
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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. Finally, we will have a session on conducting field experiments with guest speaker David Tannenbaum, Assistant Professor of Management at the Eccles School of Business, University of Utah (<https://dave.tannenbaum.github.io/>).

### 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
- Software: SPSS, SAS, JMP, STATA, R, Jamovi, Python, ChatGPT
- 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

(<https://medium.com/@rondotsch/degrees-of-freedom-tutorial-8d8e5c7be6ec>)

- 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). Together with your write-up also submit the software code.

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 you 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 from your analysis? Prepare a couple of PowerPoint slides to present your analyses and results in class.

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

## Papers to read

- André, Q. (2022). Outlier exclusion procedures must be blind to the researcher's hypothesis. *Journal of Experimental Psychology: General*, 151(1), 213.
- Cohn A, Marachél MA, Tannenbaum D, and Zünd C (2019). Civic honesty around the globe. *Science*, 365, 70-73.
- 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.





## Tentative schedule

Class	Date Time	Room	Topic	Homework/Readings
1	Oct 31 <sup>st</sup> 8:30 – 12:00	101	The logic of experimentation, hypothesis testing, ANOVA, simple and contrast effects	we will do assignment 1 in class
2	Nov 7 <sup>th</sup> 8:30 – 12:00	101	Factorial designs, interactions, ANOVA and regression, ANCOVA	Assignments 2 & 3 due
3	Nov 14 <sup>th</sup> 8:30 – 12:00	101	Within-subject manipulations and mixed designs	Read Assignment 4 (we will do it in class) Assignment 5 due
4	Dec 2 <sup>nd</sup> 14:45 – 18:00	4E4 SR01	Guest Speaker Prof. David Tannenbaum: Field Experiments	Assignment 6 due <u>Read the following papers:</u> Cohn et al. (2019)
5	Dec 4 <sup>th</sup> 8:30 – 12:00	101	Effect size, power, and non-parametric tests	Assignment 7 due <u>Read the following papers:</u> Nelson et al. (2018) Simmons, Nelson, and Simonsohn (2011)
6	Dec 9 <sup>th</sup> 8:30 – 12:00	101	Thinking about Data Analysis, P-hacking, Preregistration, replications	Final Assignment due <u>Read the following papers:</u> Simonsohn et al. (2014 <i>JEPG</i> ) Andrè (2022) Simonsohn (2015) Simmons et al. (2021)

## 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.

