



Introduction to Quantitative Methods

Instructors:

Juho Härkönen, Professor of Sociology
Arnout van de Rijt, Professor of Sociology

Course assistants:

Elena Pisanelli, Ph.D. researcher (Stata lab)
Ariane Aumaitre, Ph.D. researcher (R lab)

Lecture: **Monday, 11:00-13:00**, zoom room (check in the schedule)

Lab: **Tuesday, 11:00-13:00**, zoom room (check in the schedule)

Compulsory seminar: Must be taken during the first two years of the programme. Can be substituted with "Introduction to Econometrics and Regression", offered by the Economics Department.

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This course is an introduction to quantitative methods in the social sciences. It is mandatory and can be taken either during the first or the second year of the SPS doctoral programme. The course will be taught online with the possibility of following the lecture and lab in a "Zoom room" on campus (please see below).

The course covers measurement, hypothesis testing and statistical inference, linear regression, and regression for binary outcomes. The course consists of lectures and labs (either in STATA or R), for which the students are required to do the homework assigned each week. For each lecture, we assign readings that you are expected to do in advance.

Those of you who have not taken courses in quantitative methods, are new to Stata and R, or need to brush up their skills in these, should definitely take the Introduction to Data Analysis course in September. You will need the skills taught in that course to successfully follow Introduction to Quantitative Methods. For those of you who are already more advanced in quantitative research, we assign (voluntary) extra homework on issues that go deeper into each week's topic.

The software packages used in the labs are STATA and R. If you are familiar with one of them, this course provides an opportunity to learn the other. Your homework needs to be uploaded on the course site before the lab.

Coursebook

Agresti, Alan (2018). *Statistical Methods for the Social Sciences*, Fifth edition. Pearson.

This is the main book used in the course. The library has copies of it, but it is not a bad idea to purchase it.

Other books that cover the issues and can be helpful include:

Gordon, R. (2015). *Regression Analysis for the Social Sciences*, 2nd Edition. Routledge.

Imai, K. (2017). *Quantitative Social Science: An Introduction*. Princeton.

Wooldridge, J. M. (2015). *Introductory econometrics: A modern approach*, 4-6th Edition. Nelson Education.

Angrist, J. and J.-S. Pischke. (2009). *Mostly Harmless Econometrics*. Princeton

Field, A., and J. Miles. (2012). *Discovering statistics using R*. Sage.

Dalgaard, P. (2008). *Introductory statistics with R*. Springer Science & Business Media.

Treiman, D J. (2009). *Quantitative Data Analysis: Doing Social Research to Test Ideas*. Jossey-Bass.

Schedule:

Week 1. Overview of the purpose of quantitative research and of social science data and measurement.

Readings: Agresti, Ch. 1

Optional readings: Angrist and Pischke Ch. 1; Gordon Ch. 1

| | Time and Date | Zoom Room | Max. Capacity |
|-------------------|---|----------------------------------|-----------------------|
| Lecture: | Monday, 5 October 2020, 11:00-13:00 | Seminar Room 1 Seminar Room 2 | 8 people 14 people |
| Lab STATA: | Tuesday, 6 October 2020, 11:00-13:00 | Seminar Room 3 | 10 people |
| Lab R: | Tuesday, 6 October 2020, 11:00-13:00 | Seminar Room 2 Seminar Room 1 | 14 people 8 people |

Week 2. Inference: Measurement and uncertainty

Readings: Agresti, Ch. 2, (3), 4–5.3

Optional readings: Imai, Ch. 3.1-3.3, 7.1; Treiman, Ch. 9.

| | Time and Date | Zoom Room | Max. Capacity |
|-------------------|--|----------------------------------|------------------------|
| Lecture: | Monday, 12 October 2020, 11:00-13:00 | Seminar Room 2 Seminar Room 3 | 14 people 10 people |
| Lab STATA: | Tuesday, 13 October 2020, 11:00-13:00 | Seminar Room 3 | 10 people |
| Lab R: | Tuesday, 13 October 2020, 11:00-13:00 | Seminar Room 2 Seminar Room 1 | 14 people 8 people |

Week 3. Hypothesis testing

Readings: Agresti, Chs. 6-7

Optional readings: Imai, Ch. 7.2; Treiman, Ch. 1.

| | Time and Date | Zoom Room | Max. Capacity |
|-------------------|--|----------------------------------|------------------------|
| Lecture: | Monday, 19 October 2020, 11:00-13:00 | Seminar Room 2 Seminar Room 4 | 14 people 10 people |
| Lab STATA: | Tuesday, 20 October 2020, 11:00-13:00 | Seminar Room 1 | 8 people |
| Lab R: | Tuesday, 20 October 2020, 11:00-13:00 | Seminar Room 2 | 14 people |

Week 4. Binary regression and ordinary least squares estimation

Readings: Agresti, Ch. 9.

Optional readings: Imai, Ch. 4; Wooldridge Ch. 2 & 3; Field et al., Ch. 7.1–7.5; Dalgaard, Ch. 6; Gordon, Ch. 5; Treiman, Ch. 5.

| | Time and Date | Zoom Room | Max. Capacity |
|-------------------|--|----------------------------------|------------------------|
| Lecture: | Monday, 26 October 2020, 11:00-13:00 | Seminar Room 2 Seminar Room 3 | 14 people 10 people |
| Lab STATA: | Tuesday, 27 October 2020, 11:00-13:00 | Seminar Room 3 | 10 people |
| Lab R: | Tuesday, 27 October 2020, 11:00-13:00 | Seminar Room 2 | 14 people |

Week 5. Multiple regression: spurious effects, suppressor effects, and control variables

Readings: Agresti, Ch. 10, 11.1-11.3

Optional readings: Wooldridge, Ch. 2 & 3; Field et al., Ch. 7.6–7.8, 7.11-7.12; Dalgaard, Ch. 11, Imai 4.3. Gordon, Ch. 6, 7; Treiman, Ch. 6.

| | Time and Date | Zoom Room | Max. Capacity |
|-------------------|--|----------------------------------|------------------------|
| Lecture: | Monday, 2 November 2020, 11:00-13:00 | Seminar Room 2 Seminar Room 3 | 14 people 10 people |
| Lab STATA: | Tuesday, 3 November 2020, 11:00-13:00 | Seminar Room 3 | 10 people |
| Lab R: | Tuesday, 3 November 2020, 11:00-13:00 | Seminar Room 2 | 14 people |

Week 6. Categorical predictors, normality, multicollinearity, heteroscedasticity

Readings: Agresti, Ch. 12.1, 13.1-13.2, 14.1–14.3

Optional readings: Imai, Ch. 7.3; Wooldridge, Ch. 4 & 5; Field et al. Ch. 7.7, 7.9; Dalgaard Ch. 11; Gordon, Ch. 11; Angrist and Pischke Ch. 8.

| | Time and Date | Zoom Room | Max. Capacity |
|-------------------|---|----------------------------------|------------------------|
| Lecture: | Monday, 9 November 2020, 11:00-13:00 | Seminar Room 2 Seminar Room 3 | 14 people 10 people |
| Lab STATA: | Tuesday, 10 November 2020, 11:00-13:00 | Seminar Room 2 | 14 people |
| Lab R: | Tuesday, 10 November 2020, 11:00-13:00 | Seminar Room 3 | 10 people |

Week 7. Non-linearity, polynomials, variable transformations, model fit

Readings: Agresti, 11.5, 14.4–14.6

Optional readings: Gordon, Ch. 7, 9; Treiman, Ch. 7, 11.

| | Time and Date | Zoom Room | Max. Capacity |
|-------------------|---|----------------------------------|------------------------|
| Lecture: | Monday, 16 November 2020, 11:00-13:00 | Seminar Room 2 Seminar Room 4 | 14 people 10 people |
| Lab STATA: | Tuesday, 17 November 2020, 11:00-13:00 | Seminar Room 2 | 14 people |
| Lab R: | Tuesday, 17 November 2020, 11:00-13:00 | Emeroteca | 14 people |

Week 8. Interaction effects

Readings: Agresti, Ch. 11.4

Optional readings: Gordon, Ch. 8, 10.

| | Time and Date | Zoom Room | Max. Capacity |
|-------------------|---|---|-------------------------------------|
| Lecture: | Monday, 23 November 2020, 11:00-13:00 | Seminar Room 2 Seminar Room 3 Refectory | 14 people 10 people 40 people |
| Lab STATA: | Tuesday, 24 November 2020, 11:00-13:00 | Seminar Room 2 | 14 people |
| Lab R: | Tuesday, 24 November 2020, 11:00-13:00 | Seminar Room 3 | 10 people |

Week 9. Binary outcomes

Readings: Agresti, Ch.4.2, 5.2, 8

Optional readings: Field et al., Ch. 8; Treiman, Ch. 13–14

| | Time and Date | Zoom Room | Max. Capacity |
|-------------------|--|----------------------------------|------------------------|
| Lecture: | Monday, 30 November 2020, 11:00-13:00 | Seminar Room 2 Seminar Room 3 | 14 people 10 people |
| Lab STATA: | Tuesday, 1 December 2020, 11:00-13:00 | Seminar Room 2 | 14 people |
| Lab R: | Tuesday, 1 December 2020, 11:00-13:00 | Seminar Room 3 | 10 people |

Week 10. Regression for binary outcomes

Readings: Agresti, Ch. 15

| | Time and Date | Zoom Room | Max. Capacity |
|-------------------|--|----------------------------------|------------------------|
| Lecture: | Wednesday, 9 December 2020, 9:00-11:00 | Seminar Room 2 Seminar Room 3 | 14 people 10 people |
| Lab STATA: | Wednesday, 9 December 2020, 11:00-13:00 | Seminar Room 3 | 10 people |
| Lab R: | Wednesday, 9 December 2020, 11:00-13:00 | Seminar Room 2 | 14 people |

Week 11. Recap

| | Time and Date | Zoom Room | Max. Capacity |
|-------------------|---|----------------------------------|------------------------|
| Lecture: | Monday, 14 December 2020, 11:00-13:00 | Seminar Room 2 Seminar Room 3 | 14 people 10 people |
| Lab STATA: | Tuesday, 15 December 2020, 11:00-13:00 | Seminar Room 3 | 10 people |
| Lab R: | Tuesday, 15 December 2020, 11:00-13:00 | Seminar Room 2 | 14 people |