

MODELS IN R AND THEIR INTERPRETATION

Fall 2016

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| Lecturer: Benjamin Schlegel | Lecture Time: Mo. 12.15 – 13.45 |
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Goal: R is a very useful open source program to perform statistical computations and draw nice graphics. The program can be very helpful for the master thesis, but also for later. If you decide to write a PhD and plan your career at the university, if you plan to work at the government or if you want to become a journalist, R will often be a useful tool to make things easier and faster. However, just to know how to calculate something with R is mostly not enough, it is also important **to know what to do with the results** it produces.

The goal of this course is to improve your knowledge in R, perform statistics with it and know how to deal with the output. You will learn to know different models, how you can interpret them and how to draw useful graphics.

The course consists of two parts. In the first part, we are going to learn logit and ordinal logit **in deep** using various tools, which we will look at in detail. You will learn how to calculate discrete change with the package `glm.predict`, but also by hand with a simulation. You will learn how to plot the results and interpret them. In the first part, there will be **exercises** every other week, where you can benefit by applying the tools with real world data.

In the second part of the course, we will look at some other models to get you the basics of them. After multinomial and count models, we will learn how to handle multilevel designs and models varying over time.

That you get the most out of the course, it is important that you participate in the lectures and exercises.

Course Pages

1. <https://lms.uzh.ch/olat/dmz/>
2. <http://www.politikwissenschaften.ch>

Office hours / R-Helpdesk: Monday, 14.30-16.30 or by appointment (AFL-H-351).

Requirements: Basic statistic knowledge (e.g., Angewandte Methoden der Politikwissenschaft).

Software: This course is taught with the open source statistics program R. Because of its flexibility, universalism and the excellent graphic possibilities, R is becoming more and more the standard program of data analysis in political science. R is available for all major operation systems and can be downloaded from [Comprehensive R Archive Network](#). I highly recommend you to also install **RStudio**, which has a nice graphical interface for R. Make sure to first install R and then RStudio.

Assessment: In this course you will have to write a term paper with focus on estimation and interpretation to apply what you learned in Part I. In general, you will have to formulate hypotheses and reason them. You do not have to write theory or a literature review. A meaningful reasoning of the hypotheses will be enough. However, it is important that you test your hypotheses correct and do a good interpretation of the results with beautiful graphics. The details will be told latest at the end of Part I.

Deadline: You must upload your term paper on **OLAT** latest on *Monday, January, 2nd 2017, 23:59*.

Important: Please register for the course in the *Modulbuchungstool*. Otherwise you will not be able to get any ETCS-Points for the course.

Program:**┃ PART 0: INTRODUCTION**

Week 1 – September, 19th – Introduction

organisation; repetition OLS (When the dependent variable is continuous.)

Week 2 – September, 26th – exercices OLS

exercices OLS

┃ PART I: LOGIT AND ORDINAL LOGIT

Week 3 – October, 3rd – logistic regression

logistic regression and `glm.predict` (When the dependent variable is dichotomous.)

Week 4 – October, 10th – graphics in R

learn to use the R library `ggplot2`

Week 5 – October, 17th – exercices interpretation glm

practice to calculate predicted probabilities, discrete changes, and plot them in R

Week 6 – October, 24th – simulation

calculating discrete changes "by hand"

Week 7 – October, 31st – exercices simulation

exercices for simulation

Week 8 – November, 7th – ordinal logistic regression

`polr` (When the dependent variable is ordinal scaled)

Week 9 – November, 14th – exercices ordinal logistic regression

exercices `polr`

┃ PART II: OTHER MODELS

Week 10 – November, 21th – count models

poisson, quasi poisson, negativ binomial (When the dependent variable is a count variable.)

Week 11 – November, 28st – multinomial logistic regression & multilevel

`multinom` (When the dependent variable is nominal scaled.)

`lmer` (When there is more then one level with a continuous variable.)

Week 12 – December, 5th – panel data

`plm` (When there are multi timepoints with the same units and the dependant variable is continuous.)

Week 13 – December, 12th – ?

open

Week 14 – December, 19th – feedback

Feedback