



SPS 3rd term seminar 2019-2020

Multilevel Modeling

Organised by Juho Härkönen

Instructor: Levi Littvay (EUI Fernand Braudel Fellow)

Date: 18-22 May 2020 (10:00 – 15:00)

The workshop will take place via zoom

Register [online](#)

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This course will teach you a basic conceptual understanding of multilevel (a.k.a. hierarchical or mixed) modelling and its statistical foundations. You will learn how to critically assess the appropriateness of such techniques in your own and other people's research. I will pay special attention to the translation of theoretical expectations into statistical models, the interpretation of results in multilevel analyses and the general use and misuse of multilevel models in the social sciences. The course also arms you with the basic tools to run multilevel models in software. (Though no laptops are needed. We will go through models together but we will not run them together. You can run them after hours based on the materials I will provide.) Applications will include models with continuous and limited dependent variables in hierarchical, longitudinal and cross-classified nesting situations. By the end of the course, you will be able to use and critically assess multilevel models and to independently discover and master advanced multilevel statistical topics.

Prerequisite Knowledge

Solid understanding of multivariate linear and logistic regression analysis is required, including:

- understanding of the assumptions of regression model
- limited dependent variable models
- understanding of link functions
- use of interactions.
- Knowing how to run a regression in software (knowing where to click and what to look for in the results output) does not constitute what I consider a 'solid' understanding.

If you know what heteroskedasticity is and how to diagnose it, why the independence of observation('s residual)s are necessary in a regression model and if you know how to interpret and plot two-way interactions for linear and logistic regression models, you are prepared to take this course. If you do not, I recommend extra preparation before the course. A good summary of regression can be had using Lewis-Beck and

Lewis-Back (2015) and Fox (1991) from the SAGE, Quantitative Applications in the Social Sciences series. For logistic regression Pampel (2000), same series.
Software

This class is predominantly focused on multilevel modelling. I firmly believe that if you know what you are doing, figuring out the appropriate software implementation (with some manual diving) is the easy part. So we will focus on making sure you know what you are doing. This said, I will provide the basic tools for you to apply this knowledge in R (though I do have relevant Stata and SPSS code, though not necessarily updated as well as the R code, as I do not own Stata and SPSS licenses and rely on participants and teaching assistants to update these - and they were not updated for a while. If you do update, please let me know.

Recommended Readings:

Day 1:

Marco Steenbergen and Bradford Jones (2002)
Modeling Multilevel Data Structures
American Journal of Political Science 46(1): 218–237

Douglas Luke (2004)
Multilevel Modeling - Ch 1-2
Sage Quantitative Applications in the Social Sciences: London

Stegmüller, Daniel (2013)
How Many Countries for Multilevel Modeling? A Comparison of Frequentist and Bayesian Approaches
American Journal of Political Science, 57(3), 748–761

Martin Elff, Jan Paul Heisig, Merlin Schaeffer, and Susumu Shikano (*forthcoming*)
Multilevel Analysis with Few Clusters: Improving Likelihood-based Methods to Provide Unbiased Estimates and Accurate Inference
British Journal of Political Science

Day 2:

Craig K. Enders and Davood Tofighi (2007)
Centering predictor variables in cross-sectional multilevel models: A new look at an old issue
Psychological Methods 12(2): 121–138

Jan Paul Heisig, Merlin Schaeffer (2019)
Why You Should Always Include a Random Slope for the Lower-Level Variable Involved in a Cross-Level Interaction
European Sociological Review, Volume 35, Issue 2, April 2019, Pages 258–279

Day 3:

Douglas Luke (2004)
Multilevel Modeling - Ch 3
Sage Quantitative Applications in the Social Sciences: London

Day 4:

Judith Singer and John Willett (2003)
Applied Longitudinal Data Analysis: Modeling Change and Event Occurrence
Chapter 7: Examining the Multilevel Model's Error Covariance Structure
New York: Oxford University Press

Day 5:

Fielding, Anthony, and Harvey Goldstein (2006)
Cross-classified and Multiple Membership Structures in Multilevel Models: An
Introduction and Review
Research Report No. RR791, Department for Education and Skills, United Kingdom

Another Good Introductory Text (beyond Luke):

Robert Bickel (2007)
Multilevel Analysis for Applied Research: It's Just Regression! (Methodology in the
Social Sciences)
The Guilford Press

Good Reference Texts:

Stephen W. Raudenbush and Anthony S. Bryk (2002)
Hierarchical Linear Models: Applications and Data Analysis Methods (second ed.)
Sage

Joop Hox (2002, 2010)
Multilevel Analysis: Techniques and Applications
Routledge

Tom A. B. Snijders and Roel Bosker (1999, 2011)
Multilevel Analysis: An Introduction to Basic and Advanced Multilevel Modeling
Sage

For Longitudinal Multilevel Analysis
Judith Singer and John Willett (2003)
Applied Longitudinal Data Analysis: Modeling Change and Event Occurrence
Oxford University Press