Multivariate Data Analysis 1 / Eldad Davidov

Course Outline:

The course provides an overview of methods to analyze individual, contextual and longitudinal data and how theories can be tested using these methods with a focus on the analysis of survey data. Terms discussed during the BA studies, such as reliability, validity, standardized and unstandardized coefficients, measurement and index construction will be deepened and expanded. We discuss how regression models and the analysis of cross-sectional data may be expanded to analyze longitudinal and panel data, data on different levels of analysis (individual and societal data), and data from several countries or cultural groups. Special attention is also given to the differentiation between manifest and latent variables and to the problem of missing values. It is shown how these methods are applied to survey and experimental data in empirical theoretically-driven contemporary sociological studies. The course will combine lectures, exercises and students’ presentations.

Detailed Program:

Meetings 1-3) Overview of the whole course. Repetition of central methodological concepts from the Bachelor studies (index, reliability, validity, measurement, correlation and covariance, regression, logistic regression). Introduction to new methods of data analysis.

Meetings 4-7) Overview of applications of more advanced methods using data from the European Social Survey and other data sources: Multilevel analysis; Manifest vs. latent variables; Multiple-group analysis; Missing values; and longitudinal and panel data. Presentation and discussion of substantive empirical and theoretically-driven sociological studies that apply advanced methods to answer various research questions. Discussions will combine substantive aspects in the studies and more ‘technical’ aspects of the methods used. Students will get to know these methods and understand their operation and use.

Meetings 8-13) Lectures and exercise: The last meetings will delineate how the different methods discussed so far are all related to each other and expand regression and multivariate analysis techniques that are already known from the BA. Topics of lectures and exercises will include: the process and strategy of theory testing; measurement issues; manifest vs. latent variables and index construction; formative vs. reflective indicators; types of measurement errors and how to control for them; typology of classical model testing: parallel, tau-equivalent and congeneric models vs. cronbach’s alpha; reliability and validity; single- vs. multiple-group analysis; confirmatory factor analysis of single concepts vs. confirmatory factor analysis of multiple concepts; model evaluation, global and detailed fit. It will be shown how these are necessary elements when cross-sectional, multilevel, multi-group or panel data are analyzed. Exercises will include data from the European Social Survey.

Meeting 14) Examination
General Literature:

Books (and one paper) that deal with ordinary and logistic regressions, multilevel analysis, manifest vs. latent variables, multiple-group analysis, missing values and longitudinal and panel data:


Papers for students presentations:

Latent variables and multiple-group comparison:

Multilevel analysis:

Analysis of panel data, dealing with missing values, higher order factors:
Satorra (Eds.), Longitudinal models in the behavioral and related sciences (pp. 315-336). Mahwah, New Jersey: Lawrence Erlbaum Publishers, EAM Book Series.

- Davidov, E., S. Thörner, P. Schmidt, S. Gosen and C. Wolf (accepted for publication). Level and change of group-focused enmity in Germany: Unconditional and conditional latent growth curve models with four panel waves. Advances in Statistical Analysis.

