Content:
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, regression, measurement and index construction, or experimental design will be either partly repeated or 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-level 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 is thus application-oriented rather than technical.

Goals: Providing an overview of various methods of data analysis beyond regression analysis. Being able to read, understand and interpret substantive studies that apply various advanced methods. A deep understanding of some of the methods discussed will require at least a full semester course. Thus, it becomes obvious that the goal cannot be a full command of each method, but a basic understanding of what it is good for, and how to interpret its estimates in substantive studies.

Requirements: Written exam and Referat plus active participation in the discussion.

Detailed Program:
18.09. Organization, overview, division of topics for presentation among participants

25.09. Repetition: Variance, correlation, covariance, type of scales (Datler)

02.10. Repetition: OLS regression, logistic regression, discussion which types of analyses cannot be performed with OLS and logistic regression (Seddig)

09.10. Path analysis (Seddig)

16.10. Exploratory and confirmatory factor analysis (EFA, CFA) (Datler)

23.10. Full structural equation modeling (SEM) including the topics model fit, model testing (Seddig)
Methodological literature: Schumacker and Lomax (2004), pp. 195-229; Reinecke (2005),

30.10. **Multiple group analysis** (Datler)
Methodological literature: Davidov, Meuleman, Cieciuch, Schmidt and Billiet (2014).

06.11. **Panel data analysis: Autoregressive cross-lagged models (ARCL)** (Seddig)

13.11. **Panel data analysis: Latent growth curve modeling (LGM) and LGM mixture modeling** (Seddig)
Methodological literature: Duncan, Duncan and Strycker (2006), pp. 1-79.
Substantive study: Schlüter, Davidov and Schmidt (2007).

20.11. **Multilevel analysis** (Datler)

27.11. **Experimental designs** (Seddig)

04.12. **Repetition** (Datler/Seddig)

11.12. **Guest speaker**: Tenko Raykov

18.12. **Exam**

**References:**


Multivariate data analysis in R A collection of R functions for multivariate data analysis Michail Tsagris Department of Economics, University of Crete, Rethymnon mtsagris@uoc.gr Version 9.6 Nottingham, Abu Halifa, Athens, Herakleion and Rethymnon 29 February 2020 Contents 1 Some things about R 1 1.1 A few tips for faster implementations . . . 81 4.3.4 Box-Cox transformation in discriminant analysis . . . 83 4.3.5 Regularised discriminant analysis . . . 85 4.3.6 Discriminant analysis with mixed data . . . 90 4.3.7 Discriminant analysis for multinomial data . . . 93 5 Distributions 98 5.1 Maximum likelihood estimation . . Multivariate Data Analysis. 203 Pages · 2013 · 6.1 MB · 3,238 Downloads· English. Preview. Discover best practices for data analysis and software development in R and start on the path Multivariate Data Analysis. 761 Pages·2009·11.11 MB·4,190 Downloads. is removed. From Chapter 1 of Multivariate Data Analysis, 7/e Multivariate Data Analysis: Data Analysis and Science Using Pandas, matplotlib, and the Python. 350 Pages·2015·12.05 MB·98,483 Downloads·New! Python Data Analytics: Data Analysis and Science Using Pandas, matplotlib, and the Python Multivariate Data Analysis (7th Edition). 761 Pages·2009·11.11 MB·3,579 Downloads·New! to understand and apply multivariate data analysis for the nonstatistician by focusing on the fundamental concepts that affect the use of specific techniques. Question: Do your students struggle with the application and interpretation of various techniques in multivariate data analysis? NEW "Rules of Thumb" for the application and interpretation of the various techniques in multivariate data analysis. Benefit: These guidelines will facilitate utilization of techniques. Example: "Rules of Thumb" are highlighted and integrated throughout the content. In multivariate data analysis, many methods use different types of decompositions with the aim of describing, or explaining the data matrix (or, more typically the variance-covariance or correlation matrix). Eigenvalues and eigenvectors play an important role in the decomposition of a matrix. The denition of these terms and the theory can be found in the notes or the textbook. A Principal component analysis (PCA) tries to explain the variance-covariance structure of a set of variables through a few linear combinations of these variables [2]. Its general objectives are: data reduction and interpretation. Principal components analysis is often more effective in summarizing the variability in a set of variables than when these variables are highly correlated. Eldad Davidov. Professor of Sociology, University of Cologne, Germany, and University of Zurich, Switzerland. Verified email at uni-koeln.de - Homepage. An SEM approach to continuous time modeling of panel data: Relating authoritarianism and anomia. MC Voelkle, JHL Oud, E Davidov, P Schmidt. Psychological methods 17 (2), 176, 2012. 188. 2012. Cross-cultural analysis: Methods and applications. E Davidov, P Schmidt, J Billiet, B Meuleman. Routledge, 2018.