Multilevel 2: Analyzing Comparative Longitudinal Survey Data with Multilevel Models

Week 3 (Regular course)

Duration: 12 hours/3 days

Format: In person and online

Instructor: Alexander Schmidt-Catran

Course description:

Many international surveys have now been fielded multiple times over the course of years or even decades. Examples include the European Social Survey, the World Values Survey, the International Social Survey Programme, and the EU Statistics on Income and Living Conditions. The range of topics that can be studied using data from these surveys is extremely broad: from demography over religiosity to social and political attitudes and behaviours. This course will teach students how to analyse these comparative longitudinal survey data (CLSD) using multilevel models that exploit three different kinds of variation: differences between countries, change within countries over time, and variation across individuals. We will begin by considering the hierarchical structure of CLSD and see that it has a particular three-level structure. We then extend the basic two-level model to a three-level model and learn how to apply it to CLSD. Next, we will briefly recapitulate some of the insights from the tradition of panel data analysis. The modelling strategies from this tradition will then be applied to CLSD. At the end of the course students will be able to apply multilevel models to CLSD in order to describe differences between countries and social change within them and to test hypotheses about the influence of country-level characteristic on individual outcomes. We will use the open source software R, but the lab sessions can also be done with Stata (code and data will be provided for both).

Learning schedule:

Day 1	9h-10h45	Lecture: Introduction to comparative longitudinal survey data and the three-level multilevel model
	10h45-11h15	Break
	11h15-13h	Lab session: Applying three-level models to comparative longitudinal survey data
Day 2	9h-10h45	Lecture: What we can learn from panel data analysis
	10h45-11h15	Break
	11h15-13h	Lab session: Estimating fixed and random effects models and growth curve models
Day 3	9h-10h45	Lecture: Exploiting the longitudinal dimension in comparative longitudinal survey data
	10h45-11h15	Break
	11h15-13h	Lab session: Applying models that decompose within- and between effects and estimating societal growth curve models

Prerequisites:

Students will need a basic understanding of multilevel models, and some experience of designing and fitting them. Those unfamiliar with multilevel/random-effects models, but who are familiar with panel data analysis, are also welcome to join. Students unfamiliar with multilevel/random effects models are encouraged to enrol first in the course "Multilevel 1" taught by Leonardo Grilli and Carla Rampichini on week 2. Students are not required to have any prior familiarity with R. If students want to use Stata instead of R, they should be familiar with Stata. Example code will be provided for both R and Stata, but detailed explanations in the lecture will be for R.

Software:

Students can use either R or Stata for the lab sessions. In the lectures, we will mostly refer to R code. In the lab sessions, data and example code will be provided for both R and Stata. Students need to bring their own laptop and have the software of their choice already installed. Students who use R should ideally install the following packages beforehand (tidyverse, foreign, lme4, lmerTest, plm, panelr).

Readings:

The following readings are helpful, but it is not necessary to read them in advance of the course. References will be given during the lectures.

Bell, Andrew, and Kelvyn Jones. 2015. "Explaining Fixed Effects: Random Effects Modeling of Time-Series Cross-Sectional and Panel Data." *Political Science Research and Methods* 3[1]: 133–153.

Bell, Andrew, Malcolm Fairbrother, and Kelvyn Jones. 2019. "Fixed and random effects models: making an informed choice." *Quality & Quantity* 53: 1051–1074.

Fairbrother, Malcolm. 2014. "Two Multilevel Modeling Techniques for Analyzing Comparative Longitudinal Survey Datasets." *Political Science Research and Methods* 2[1]: 119–140.

Schmidt-Catran, Alexander W., and Malcolm Fairbrother. 2016. "The Random Effects in Multilevel Models: Getting Them Wrong and Getting Them Right." *European Sociological Review* 32[1]: 23-38.

Schmidt-Catran, A. W., Fairbrother, M., & Andreß, H. J. 2019. "Multilevel Models for the Analysis of Comparative Survey Data: Common Problems and Some Solutions." *Kölner Zeitschrift für Soziologie & Sozialpsychologie*, 71: 99-128.

Instructor short bio:

Alexander Schmidt-Catran is a full professor of sociology at the Goethe-University in Frankfurt, Germany, and a guest professor at the Catholic University Leuven, Belgium. He teaches applied statistics at all levels, mostly focusing on the use of multilevel models for the analysis of internationally comparative data and panel data. He has studied in Cologne, Germany, where he also did his PhD. He then became a professor in Mannheim, Germany, before he went to the Goethe-University in Frankfurt. He has published methodological papers on the analysis of panel data and on the application of multilevel models in journals like Sociological Methodology, Sociological Methods and Research, and the European Sociological Review. His substantive research focusses on attitudes towards the welfare state and immigration and has been published in the American Sociological Review, the European Sociological Review and the Journal of Ethnic and Migration Research.