IQB
Forschungsdatenzentrum

Multilevel Modeling for Longitudinal Data in R

FDZ Frühjahrsakademie / Spring Academy 2026

- Lecturer: Dr. Takuya Yanagida (University of Vienna)
- Date and Time: Part 1: Wednesday, 11.03.2026, 9:00 – 13:00
  Part 2: Thursday, 12.03.2026, 9:00 – 13:00

Contents

Longitudinal studies in the social sciences use repeated measurement data to examine (a) intra-individual change and (b) inter-individual differences in intra-individual change over time. This workshop offers an introduction to the analysis of longitudinal data based on multilevel models in R. The first part of the workshop will discuss the theoretical foundations of longitudinal research. In the second part of the course, different multilevel models for analyzing longitudinal data will be presented. Building on this, practical examples and exercises related to social science questions will be discussed.

The following topics will be covered in the course:

- Longitudinal research
- Multilevel models for longitudinal data
  - Null model, random intercept model, and random intercept and slope model
  - Time-varying and time-invariant covariates
  - Specification of the variance-covariance matrix of the residuals

Previous knowledge required

Basic knowledge of regression analysis and practical experience with the statistics program R are required for participation.

Literature

Grimm, K. J., Ram, N., & Estabrook, R. (2017). *Growth modeling: Structural equation and multilevel modeling approaches*. Guilford.

Humboldt-Universität zu Berlin
Institut zur Qualitätsentwicklung im Bildungswesen e.V.
Unter den Linden 6, 10099 Berlin

Telefon +49 30 2093 46552
fdz-akademie@hu-berlin.de
www.iqb.hu-berlin.de

KULTUSMINISTER KONFERENZ

Singer, J. D., & Willett, J. B. (2003). *Applied longitudinal data analysis: Modeling change and event occurrence*. Oxford University Press.

Software requirements

R version 4.5.0 or later, RStudio version 2025.06 or later, and the latest versions of the following R packages are required to work through the examples and exercises: lme4, nlme and misty.