

Workshop: Latent Change Score Modelling in R
Lecturer: Dr. Takuya Yanagida (University of Vienna)
Date: Part 1: Thursday, 13.03.2025, 09:00 – 13:00
Part 2: Friday, 14.03.2025, 09:00 – 13:00

Abstract

Latent change score (LCS) models (McArdle, 2009) provide a flexible modeling approach for investigating latent intraindividual mean change and interindividual differences in change in outcomes across consecutive time points. In program evaluation, these models can be used for testing (1) the overall program effectiveness, (2) moderators of program effectiveness, and (3) mediators of program effectiveness.

Content

The goal of the workshop is to provide an introduction to latent change score modeling using the R package lavaan for investigating the effectiveness of an intervention program in a randomized controlled trial (RCT). The following contents are covered in the course:

- Program Development and Evaluation
- Latent Change Score (LCS) Models with Manifest Variables
 - Autoregressive Structure in the LCS Model
 - Unconditional vs. Conditional LCS Model
 - Multiple-Group LCS Model
- Latent Change Score (LCS) Models with Multi-Item Scales
 - Measurement of Psychological Constructs and Measurement Error
 - Confirmatory Factor Analysis and Measurement Invariance
 - Second-Order LCS Model
- Moderation and Mediation in Latent Change Score Modelling
 - Moderators of Intervention Effects
 - Half- and Full-Longitudinal LCS Mediation Model
- Analysis of Covariance vs. Change Score Approach in Non-Randomized Studies

Prerequisite

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

Literature

Lüdtke, O., & Robitzsch, A. (2023). ANCOVA versus change score for the analysis of two-wave data. *Journal of Experimental Education*. Advance online publication.

<https://doi.org/10.1080/00220973.2023.2246187>

Könen, T., & Karbach, J. (2021). Analyzing individual differences in intervention-related changes. *Advances in Methods and Practices in Psychological Science*, 4(1), Article 2515245920979172. <https://doi.org/10.1177/2515245920979172>

McArdle, J. J. (2009). Latent variable modeling of differences and changes with longitudinal data. *Annual Review of Psychology*, 60, 577-605.

<https://doi.org/10.1146/annurev.psych.60.110707.163612>

Newsom, J. T. (2023). *Longitudinal structural equation modeling. A comprehensive introduction* (2nd ed.). Routledge.

Software

R version 4.4.0 or later, RStudio version 2024.04 or later, and the latest versions of the following R packages are required to work through the examples and exercises: lavaan and misty.