

Latent variable models

§ Name of instructor

Silvia Bacci, University of Florence, Italy.

§ Short description

The course introduces the fundamentals of Item Response Theory (IRT) with focus on: motivation for a model-based theory, models for binary items (Rasch model, 2PL model, 3PL model), models for polytomous items (Graded Response Model, Partial Credit Model, Rating Scale Model), Rasch paradigm and specific objectivity, estimation approaches, statistical tools for model and item selection, differential item functioning, test equating. Lessons are organized with theoretical topics and examples with software R.

§ Schedule

1. Classical Test Theory versus Item Response Theory (IRT)
2. IRT models for binary items (Rasch model, 2PL model, and 3PL model): meaning of ability, basic assumptions, models parameterisation, interpretation of item parameters
3. Model selection: the Item Characteristic Curve, Person-Item map, Infit and Outfit statistics, item information, differential item functioning
4. Test equating
3. IRT models for polytomously-scored items (graded response model, partial credit model, rating scale model)

§ Introductory background

Bartolucci, F., Bacci, S., and Gnaldi, M. (2015). *Statistical Analysis of Questionnaires: A Unified Approach Based on R and Stata*. CRC Press, Boca Raton (FL), ISBN: 9781466568495

§ Facilities Required

- Software: R, open source, with the R packages ltm, mirt, eRm, difR, lordif, equateIRT installed
- Course Material. All course materials, including the data and R scripts for the examples, will be made available for course participants.