EMLYON business school

Multilevel Modeling

INSTRUCTOR

TENKO RAYKOV, PH.D.

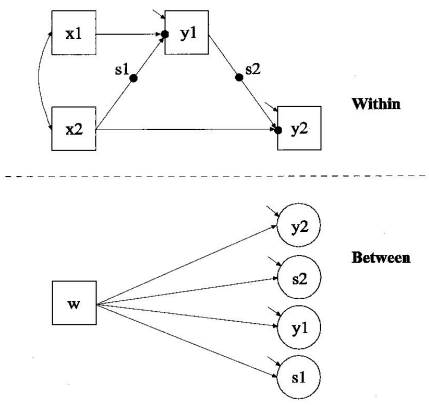
Tenko Raykov is a Professor of Measurement and Quantitative Methods at Michigan State University, East Lansing, MI, USA. He has authored over 100 peer-refereed articles in leading quantitative social and behavioral journals, a well as three books (with George A. Marcoulides). He teaches courses in multilevel modeling, structural equation and latent variable modeling, psychometric theory (social science measurement), and univariate as well as multivariate statistics.

His research interests are in statistical modeling in the social sciences, latent variable modeling, hierarchical linear and nonlinear modeling, longitudinal data analysis, missing data analysis, measuring instrument construction, and survival (event-history, duration) analysis.

4-Day Workshop Open to Faculty Members and Ph.D. Students

EMLYON (Lyon, France), 6-9 June 2011

Researchers in the business, marketing, economics, organizational, behavioral, social and biomedical disciplines often collect data that are hierarchical in nature, e.g., employees nested within firms, managers nested within companies, firms nested within industries, respondents nested within cities, students nested/clustered within classes (schools), patients nested within treatment centers, etc. Similarly, longitudinal studies can be thought of as measurements that are nested within subjects. The resulting type of data sets are characterized by the feature that as a result of this clustering the response variable values are not necessarily independent across subjects and/or assessment occasions. When this nesting effect is not negligible, ignoring it and proceeding with conventional single-level methods of analysis - for which this independence assumption is essential (e.g., general linear model, regression analysis, structural equation modeling, generalized linear model, to name a few) - may well be misleading. The reason is that these traditional methods can yield then spuriously small standard errors and thus too short confidence intervals as well as incorrect statistical test results (in particular, spurious findings of significance).



This offered 4-day workshop provides first a thorough and coherent introduction into a statistical modeling framework, viz. multilevel/hierarchical modeling, which accounts for that nesting effect and avoids these problems. In addition, the workshop includes many intermediate to advanced issues of relevance in applications of multilevel modeling in business, marketing, and economics. The workshop covers also widely applicable methods for the analysis of latent variable relationships and longitudinal data. Throughout the workshop, which is application oriented, multiple empirical examples are used from the economics, marketing, business, and social disciplines. Repeated use of the popular software, Stata and Mplus, is made, and input as well as output files from them on the example data sets are discussed in detail. The participants are provided with extensive lecture notes, the data sets used in the workshop, and copies of several related recently published articles.

The workshop includes hands-on sessions using Stata and Mplus

Stata Mplus

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Multilevel Modeling Workshop, 6-9 June 2011

Program

Daily Arrangements

09:00-10:30 Session 1: theory and applications of multilevel modeling
10:30-10:45 Break
10:45-12:15 Session 2: theory and applications of multilevel modeling
12:15-13:15 Lunch break
13:15-14:45 Session 3: theory and applications of multilevel modeling
14:45-15:00 Break
15:00-17:00 Hands-on session (homework given for next day)

Syllabus

1. What is multilevel modeling (MLM) and why do we need it?
   Hierarchical data in business, marketing, and economics
   Aggregation and disaggregation, and why they don't work (most of the time)
   Special benefits of multilevel modeling.
2. The beginnings of MLM – Why what we already know about regression analysis is so useful, and centering of predictor variables.
   A brief review of regression analysis
   Centering of explanatory variables – an easily forgotten activity that returns big dividends
   Multilevel models as sets of regression equations
3. The intraclass correlation coefficient (ICC)
   The (fully) unconditional two-level model and definition of ICC
   Variance decomposition in observed response variables
   The intraclass correlation coefficient – point and interval estimation using STATA.
4. How many levels?
   Proportion third level variance and how to evaluate it (point and interval estimation of proportion third level variance using LISREL).
5. Robust modeling of lower-level variable relationships in the presence of clustering effect (using STATA and MPLUS)
   A brief introduction to the latent variable modeling (LVM) software MPLUS
   Using LVM to examine scale (measuring instrument) structure.
6. What are mixed models, what are they made of, and why are they useful?
   Fixed and random effects
   Capabilities of STATA for fitting mixed models.
7. Random intercept models (RIM)
   Fitting a RIM using STATA
   Empirical Bayes estimates and model adequacy assessment
8. Random regression models (RRM)
   Restricted maximum likelihood (REML) estimation
   Fitting RRMs using STATA
   Random effect predictions
   Fixed effects, random effects, and total effects
   Numerical issues
   Nested levels.
9. Mixed models with discrete responses
   A quick reminder of a few important statistical facts
   The generalized linear model (GLIM)
   Fitting multilevel GLIMs using STATA
   Model choice with discrete outcome.
10. Modeling of repeated measure data (cross-sectional time-series)
    The multilevel approach to repeated measure analysis
    Fitting unconditional and conditional growth curve models using STATA.
11. Multilevel factor analysis (MLFA)
    A brief refresher on factor analysis
    Factor analysis with hierarchical data
    Multilevel confirmatory factor analysis
    MLFA for examining higher-order effects and moderator effects.

VENUE
EMLYON Business School
23 avenue Guy de Collongue
69130 Ecully, France

Airport: Lyon Saint-Exupéry
Train stations: Lyon Part-Dieu
or Lyon Perrache
GPS: 45°47'11.71" N
04°45'53.63" E

REGISTRATION
Online registration at
http://www.em-lyon.com/mm.htm

FEES
400 € for the full 4-day workshop
A receipt and a certificate of attendance will be provided.

ACCOMODATION
2-star Campanile hotel accross the street. Otherwise, wide range of hotels downtown (7 km), easily reached by public transportation. See Tourist Office website at www.en.lyon-france.com/

SOFTWARE
Participants are expected to bring their own laptop, with both STATA and Mplus installed.
A demo version of Mplus is enough for the workshop.
Participants will be given a password to use the School's WiFi network.

CONTACT
Mrs. Catherine Perrier
Assistant to the Ph.D. Program
perrier@em-lyon.com
+33 (0) 478 337 782