



Latent Growth Curve (Trajectory) Analysis

TRAINING SESSION
organized by the

QUEBEC INTER-UNIVERSITY CENTRE FOR SOCIAL STATISTICS (QICSS)

Location: CIQSS, 3535 Queen-Mary Road, local 420, Montreal
Dates: 23 - 26 May 2006

Financial support for this Data Training School is provided by the Social Sciences and Humanities Research Council of Canada, the Fonds québécois de la recherche sur la société et la culture and the universities affiliated to QICSS¹.

COURSE OBJECTIVES

The objective of this course is to introduce participants to individual-level trajectory analysis (**latent growth curve analysis**) in a structural equation modeling (SEM) framework. Both theory and application of these models to appropriate research questions in the behavioural and social sciences will be emphasized. All examples and exercises will use the Duke Established Populations for Epidemiologic Studies of the Elderly (EPESE) data set and *Mplus* software.

COURSE CONTENT

Part 1: Introduction of Growth Models in SEM

This portion of the course will cover a short review of structural equation models (SEM) and how trajectory models may be estimated in this framework. Introduction to *Mplus* software will be included.

Part 2: Estimation and Prediction

Moving forward from a simple univariate model, predictors will be included along with estimation, identification, specification (shape of growth), and model fit. Options for missing data will also be addressed.

¹ Université de Montréal, INRS-UCS, McGill University, Concordia University, Université Laval, Université du Québec à Montréal, Université de Sherbrooke.

Part 3: Applications and Extensions

Flexibility of the framework and *Mplus* will be introduced in this section, along with extensions of the traditional model including “shock” models, growth mixture models (GMM), and survival models.

TRAINER

This training session will be under the responsibility of Miles Taylor, Postdoctoral Scholar, Carolina Population Center, UNC-Chapel Hill.

GENERAL COURSE INFORMATION

The sessions are from **9 am to 5 pm** and will be in English, along with all exercises and questions. Morning sessions will consist primarily of lecture based on theory and afternoon sessions will cover computer exercises and specific questions. All workshops are given using *Mplus*.

SCHEDULE

Day 1:

- Introduction to Concepts in Trajectory Analysis and “Growth”
- Review of Structural Equation Models (SEM), Theory, Assumptions, and Strengths
- Introduction to the Unconditional Model
- Workshop: Estimating latent variables with SEM, Estimating a Linear, Unconditional Growth Model. Exercise 1.

Day 2:

- Estimating Growth Models in SEM including Tests of Model Fit
- Introduction to Various Specifications (Quadratic, Freed, etc.) and estimation with missing data
- Inclusion of Predictors
- Workshop: Choosing the best fitting growth model, Alternate specifications, Inclusion and Interpretations of Covariate Effects. Exercise 2.

Day 3:

- Flexibility of Trajectory Analysis and SEM/*Mplus*
- Introduction to Categorical Latent Variables and Growth Mixture Models (GMM), Survival Models, including strengths and weaknesses
- Application to various research questions and brief introduction to group-based trajectory analysis
- Workshop: Modeling flexibility in growth, including group (shared) experience and timing. Exercise 3.

Day 4:

- Morning session only dedicated to specific questions of participants. The instructor will address individual challenges in formulating and testing research questions using technique and software. Participants are encouraged to focus on their own research questions and data. The instructor will be available for both consultation on modeling and computing questions.

REQUIRED TEXT

Latent Curve Models: A Structural Equation Perspective. 2005. Kenneth A. Bollen and Patrick J. Curran. Wiley Series in Probability and Statistics.

Supplemental Readings and Other Course Materials Will Be Provided

PARTICIPANTS PROFILE

The course is open to graduate students, postdoctoral fellows, faculty, and researchers. Participants should have backgrounds in multivariate regression models, longitudinal analysis using secondary data, and prior introduction to structural equation models. The course is open to 15 participants who will be selected on the basis of achievement, background, and relevance of the course to their research or teaching.

APPLICATION PROCEDURE

Those wishing to attend the course are invited to register on our website (<http://www.ciqss.umontreal.ca/>). Graduate students and postdoctoral fellows who are selected to participate will be eligible for a fellowship covering registration fees and, if they live outside the greater Montreal area, transportation costs as well as lodging in the student residences of the Université de Montréal.

Registration fees are **\$200 for students and postdoctoral fellows, \$300 for professors and researchers affiliated with QICSS, \$500 for other university professors and researchers and \$750 for individuals from any other category**. Registration fees must be paid by money order or cheque made out to: QICSS – Université de Montréal.

The application deadline for the course is **April 21, 2006**. The results will be announced during the week of **May 1, 2006**.

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