

## **Course: “Continuous time modeling of panel data by means of structural equation modeling (CT-SEM)”**

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**Date:** March 6-7, 2013, from 09h30-13h00 and 14h00-17h30.

**Location:** Universitat Pompeu Fabra, Campus de la Ciutadella. Barcelona, Spain.

### **Short description of the course:**

Many constructs, such as opinions or attitudes, develop continuously over time, with researchers being interested in how and how fast they change, and how they interact when changing. Usually, however, the variables of interest cannot be observed continuously, but only at discrete measurement occasions with common panel studies being a prototypical example. The goal of the course is to demonstrate how to reconstruct the underlying change process by means of continuous time modeling.

Continuous time modeling solves serious problems of cross-lagged panel studies such as the incomparability of parameter estimates in the case of unequal observation intervals. It provides parameter estimates that are independent of the discrete time intervals a researcher happens to have chosen, and allows comparing parameter estimates across studies (or individuals) based on different intervals.

We will provide a detailed explanation of the exact discrete model (EDM) and the nonlinear SEM procedure to estimate the continuous-time parameters. To this end we will use the R-based OpenMx SEM program CT-SEM. By means of examples and exercises the participants will get the opportunity to apply CT-SEM in practice. One example in the course will concentrate upon the recently published study about the relation between authoritarianism and anomia in a German sample. Another one will concentrate on the relation between ethnocentrism, individualism, and nationalism in Flanders.

## **Course outline:**

### Day 1 – Morning

1. Why continuous time modeling?
  - 1.a. Forms of discrete time analysis.
  - 1.b. Problems of discrete time analysis and solution by continuous time analysis.
  - 1.c. Application on missing value analysis.
2. Structural Equation Modeling (SEM) and nonlinear SEM.
  - 2.a. Essentials of R.
  - 2.b. Essentials of OpenMx.
  - 2.c. Estimating SEM models by means of OpenMx.

### Day 1 - Afternoon

Exercises: Estimating various SEM models by means of OpenMx.

### Day 2 - Morning

3. Structure and details of OpenMx program CT-SEM.
  - 3.a. Application on authoritarianism and anomia in Germany.
  - 3.b. Application on ethnocentrism, individualism, and nationalism in Flanders.
  - 3.c. Application on missing value analysis in cross-national longitudinal studies.

### Day 2 - Afternoon

Exercises: Applying CT-SEM on the data sets discussed in the morning program.

**Participation:**

The course is directed to researchers and students involved and/or interested in longitudinal data models, continuous time modeling, panel data and survey research in general, especially experts coming from survey research commercial firms, and students of political science, sociology, psychology, medical sciences and economics. Computer exercises form an essential part of the course. Therefore, participants will form small groups with different backgrounds with respect to experience with panel research, knowledge of SEM and the program R. In this way we expect all to profit optimally. Prior knowledge of one or more of these topics is attractive, although not required.

**Registration procedure:**

Please send an email to [recsm@upf.edu](mailto:recsm@upf.edu), indicating your interest in registering for the course and including your name, institution, address, telephone and email address. As soon as this email is received, we will send you information on how to proceed with the payment. Registration will only be considered complete when payment for the course has been received by bank transfer. A maximum of 40 people can participate. Participants will be admitted on a first-come first-serve basis: the first 40 people who sign up and pay the registration fee will be accepted.

**Costs:**

Participants from commercial organizations: € 400

Participants working at Universities: € 200

Students (PhD, Master): € 50

**Deadline for registration:** February 28, 2013.

**Further information:** If you have any questions about the course, its program or its registration procedure, please contact us at [recsm@upf.edu](mailto:recsm@upf.edu).