Workshop objective: The goal of this three-day workshop is to help participants gain the theoretical background and applied skills to be able to address interesting research questions using latent class, latent profile, and latent transition analysis. By the end of the workshop, participants will have fit preliminary latent class, latent profile, and latent transition models to data provided by the instructors. Participants will become familiar with all of the latent class analysis concepts, and some of the latent transition analysis concepts, covered in the recent book co-authored by Drs. Linda Collins and Stephanie Lanza and published by Wiley, *Latent Class and Latent Transition Analysis: With Applications in the Social, Behavioral, and Health Sciences*¹. Participants will also become familiar with analogous latent profile analysis concepts.

General description: Workshop time will be spent in lecture, software demonstrations, computer exercises, and discussion. At the workshop, participants will be provided with all lecture notes, select computer exercises and output, and suggested reading lists for future reference. The software used in this workshop will be SAS and Mplus; support for Latent Gold will also be provided. The first two and a half days of the workshop will be spent together as a group and the last half-day of the workshop will be spent in one-on-one or small group consultations with the instructors, which will focus on applying these methods in participants’ own research projects.

Prerequisites: The prerequisite for this workshop is graduate-level statistics training for the behavioral or health sciences up through linear regression (usually two semesters of course work). Basic familiarity with SAS or Mplus and logistic regression is helpful, but not a prerequisite.

Computer requirements: Participants are strongly encouraged to bring a laptop so that they can conduct the computer exercises and analyze their own data. To conduct analyses at the workshop, SAS V9 (or above) or Mplus Version 8.3 (or above) must be installed on the laptop prior to arrival. Simulated data sets will be made available to participants for use during and after the workshop.

Topics to be covered: Introduction to latent class analysis (LCA) and the LCA model

- Model interpretation, model selection, model identification
- Multiple-groups LCA, measurement invariance across groups
- LCA with covariates, LCA with distal outcomes
- Introduction to latent profile analysis (LPA)
- Similarities and differences to LCA
- Multiple-groups LPA, measurement invariance across groups
- Introduction to latent transition analysis (LTA) and the LTA model
- Model interpretation, model selection, model identification
- Measurement invariance across time
- LTA with covariates

In addition to the above topics, there will be seven hands-on computer exercises, open discussion times, and question/answer periods.

Agenda

Day 1: Wednesday

9:00-9:15 Computer set-up
   Introductions

9:15-12:00 Introduction to latent class analysis (LCA) [Chapter 1]
   The LCA mathematical model [Chapter 2]
   Latent class homogeneity and separation [Chapter 3]
   Brief SAS tutorial
   SAS PROC LCA demo
   Exercise 1: Fitting a latent class model

12:00-1:00 Lunch

1:00-5:00 Model identification, selection, starting values [Chapter 4]
   Exercise 2: Model identification
   Exercise 3: Model selection
   Multiple-groups LCA [Chapter 5]
   Measurement invariance across groups [Chapter 5]
   Exercise 4: Multiple-groups LCA

Day 2: Thursday

9:00-12:00 Review of binary and multinomial logistic regression
   LCA with covariates [Chapter 6]
   Exercise 5: LCA with covariates
   LCA with a distal outcome
   Open Q&A session and discussion

12:00-1:00 Lunch

1:00-5:00 Introduction to latent profile analysis (LPA)
   The LPA mathematical model
   Similarities and differences when compared to LCA
   Exercise 6: Fitting a latent profile model
   Introduction to latent transition analysis (LTA) [Chapter 7]
Day 3: Friday

9:00-12:00  The LTA mathematical model [Chapter 7]
            Multiple-groups LTA
            LTA with covariates
            SAS PROC LTA demo
            Exercise 7: Fitting a latent transition model

12:00-1:00  Lunch

1:00-5:00   Open Q&A session and discussion
            Open work session with one-on-one and small group consulting
Selected Recommended Readings

Introductions to Latent Class and Latent Transition Analysis

Applications

**Addictive Behaviors Research**

**HIV Research**
**Intervention Research**


**Risk Factors Research**


**Methodology**

**Compared to Cluster Analysis**


**Power Analysis**


Distal Outcomes

Causal Inference

Longitudinal Models