Mixture and Group-Based Trajectory Models

**Exercises**

You are going to use Mplus to conduct some analyses in a dataset. The dataset is provided with the exercises, and it is called:

**NLS\_extract\_pb00\_08.dat**

The dataset is described in more details in a separate document. It includes data collected as part of the NLSY Child Survey. See:

**Dataset for exercises\_GMMetc\_OPerra.docx**

A generic input file with the name of the variables and the missing data indicator is included:

**NLS\_extract\_pb00\_08.inp**

and can be used as a starting point to create the input files to solve these exercises.

Use the dataset provided to complete the following tasks:

1. Test a latent growth model using problem behaviour scores from the year 2000 to the year 2008, i.e. variables **rbehpr00** to **rbehpr08**. Remember that these variables are ordered *categorical*. Start by specifying a model with intercept and linear slope, then specify a model with a quadratic term. Compare the fit of the two models.
2. Run Latent Class Growth Analysis (LCGA) on the variables **rbehpr00** to **rbehpr08** assuming quadratic growth, and specify a model with 2 classes. Compare the results of this model with those from the previous model with no classes (Task 1). Do these results suggest a more adequate fit of LCGA?
3. Run LCGA models on the variables **rbehpr00** to **rbehpr08** assuming quadratic growth, and specify models where the number of classes increases from 2 to 8. What model(s) appear more adequate?
4. Consider the model with 6 latent classes estimated above, Task 3. Using the Mplus options for visualising results, produce a graph that represents the probability of obtain problem behaviour scores between 4 and 7 .
5. Looking at the model parameters of the LCGA model with 6 classes estimated above (Task 3), can you also visualise how each class trajectory relates to the variables’ thresholds?
6. Use the same variables **rbehpr00** to **rbehpr08** and specify Growth Mixture Models (GMM) with quadratic growth starting with 1-class (i.e. no clustering) and increasing this to a model with 3 categories.
7. Consider the results of the GMMs estimated in Task 6 and compare these with the results of the models estimated in Task 3.
8. Use the LCGA model with 6 classes estimated in Task 4 and include the following covariates as predictors of latent class affiliation: “Child’s age in 2000 (centred and expressed in years)”, i.e.: **ageyr00** , the dummy indicator for a participant being Black or Hispanic (**bla\_his**), and the dummy indicator for a participant being male (**male**). Can you report the Odds Ratios of males being in the latent class with the lowest level of problem behaviour rather than the latent class with a chronic high level of problem behaviour?
9. Using the model above, use Mplus to visualise risk of being in the category of chronic problem behaviours for adolescents who are males and black or Hispanic.
10. Use the Mplus built-in language for the 3-Step approach and include the covariates **ageyr00 , bla\_his** and **male** as predictors of latent class affiliation in the LCGA model with 6-classes.