

Exercise 7

- A. Using the data provided (`exercise-7.sas`), fit a 2-time, 5-status latent transition model of delinquency over time using 6 indicators of the latent class variable. Use the provided starting values instead of a random seed. Be sure to impose measurement invariance across time. Interpret all parameters in the model.

The variables in `exercise-7.sas` are shown on the next page.

- B. Add a grouping variable for biological sex to the model fit in (A). Be sure to impose measurement invariance across time and groups. What are the main group differences you notice?
- C. Add a covariate for frequency of alcohol use to the model fit in (A) as follows:
- i. First, use the covariate to predict only the deltas. Specify non-delinquents as the reference status.
 - ii. Second, use the covariate to predict both the deltas and the taus. Specify a multinomial logistic regression model with non-delinquents as the reference status for the deltas, and specify a binary logistic regression model with the diagonal elements of the tau matrix as the comparison statuses for the taus.

Interpret all parameter in the model, focusing on the odds ratios.

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| LIED1 | Lied to parents about where/whom with at time 1 1 = no 2 = yes | LIED2 | Lied to parents about where/whom with at time 2 1 = no 2 = yes |
| ROWDY1 | Publicly loud/rowdy/unruly at time 1 1 = no 2 = yes | ROWDY2 | Publicly loud/rowdy/unruly at time 2 1 = no 2 = yes |
| DAMAGE1 | Damaged property at time 1 1 = no 2 = yes | DAMAGE2 | Damaged property at time 2 1 = no 2 = yes |
| STL_STR1 | Stolen something from a store at time 1 1 = no 2 = yes | SLT_STR2 | Stolen something from a store at time 2 1 = no 2 = yes |
| STL_SM1 | Stolen something worth < \$50 at time 1 1 = no 2 = yes | STL_SM2 | Stolen something worth < \$50 at time 2 1 = no 2 = yes |
| FGHTGRP1 | Taken part in a group fight at time 1 1 = no 2 = yes | FGHTGRP2 | Taken part in a group fight at time 2 1 = no 2 = yes |
| BIO_SEX | Biological sex 1 = male 2 = female | ALC_W1 | Frequency of alcohol use 0 = once per month or less often 1 = more than once per month |