Figure 4. Path Model of a Reciprocal Causal Relationship of Property Delinquent Peers and Property Delinquency
Figure 5. Measurement Model of Property Delinquent Peers and Property Delinquency
Path diagram of a four-wave random intercept model.

\[ y_{it} = \alpha_i + \varepsilon_{it} \]

\[ \alpha_i = \gamma_1 x_{1i} + \zeta_i \]
Path diagram of a four-wave linear latent growth curve model.

\[ y_{it} = \alpha_i + \lambda_t \beta_{1i} + \epsilon_{it} \]

\[ \alpha_i = \gamma_1 x_{1i} + \zeta_i \]

\[ \beta_{1i} = \gamma_2 x_{1i} + \zeta_2 \]
Path diagram of a four-wave quadratic latent growth curve model

\[ y_{it} = \alpha_i + \lambda_t \beta_{1i} + \lambda_t^2 \varepsilon_{it} \]

\[ \alpha_i = \gamma_1 x_{1i} + \zeta_i \]

\[ \beta_{1i} = \gamma_2 x_{1i} + \zeta_2 \]

\[ \beta_{2i} = \gamma_3 x_{1i} + \zeta_3 \]
Path diagram of a four-wave quadratic latent curve dual trajectory model
Growth Mixture Model (GMM) in Mplus (Muthén and Muthén 2012)

Here, $i$ indicates the intercept and $s$ indicates the slope and $c$ is a categorical latent variable consisting of one or more latent classes of trajectories. The effects of $c$ on $i$ and $s$ are analogous to regressing $i$ and $s$ on $k - 1$ dummy variables representing the $k$ latent classes of trajectories. Substantively, this means that each class of trajectories can have distinct intercepts and distinct slopes. $X$ is a vector of exogenous covariates affects $c$, the latent classes of trajectories, via a multinomial logit model. $X$ also affects $i$ and $s$ via a linear model. This model allows for heterogeneity of trajectories within classes. If such heterogeneity is assumed to be zero, this model is identical to Nagin’s (2005) group-based trajectory model.