

Table 1: List of growth model equations, error distributions, and parameters

	Equation			Error Distribution	Parameters
	<i>Deterministic</i>		<i>Stochastic</i>		
<b>Mean</b>	$y_t =$	$\bar{y}$	$+$	$\epsilon_t \sim N(0, \sigma^2)$	$\{\bar{y}, \sigma\}$
<b>Linear Change Model</b>	$y_t =$	$\beta_0 + \beta_1(\text{time})_t$	$+$	$\epsilon_t \sim N(0, \sigma^2)$	$\{\beta_0, \beta_1, \sigma\}$
<b>“Fixed-Effects” Model</b> (see notes)	$y_{ti} =$	$\beta_0 + \beta_1(\text{time})_{ti} + \delta_i$	$+$	$\epsilon_t \sim N(0, \sigma^2)$	$\{\beta_0, \beta_1, \delta_i, \sigma\}$
<b>Random Intercepts Model</b>	$y_{ti} =$	$\gamma_{00} + \gamma_{10}(\text{time})_{ti}$	$+$	$\epsilon_{ti} \sim N(0, \sigma^2)$ $\rho_{0i} \sim N(0, \tau_{00})$	$\{\gamma_{00}, \gamma_{10}, \tau_{00}, \sigma\}$
<b>Random Slopes Model</b>	$y_{ti} =$	$\gamma_{00} + \gamma_{10}(\text{time})_{ti}$	$+$	$\epsilon_{ti} \sim N(0, \sigma^2)$ $\rho_{1i} \sim N(0, \tau_{11})$	$\{\gamma_{00}, \gamma_{10}, \tau_{11}, \sigma\}$
<b>Random Intercepts and Slopes Model</b>	$y_{ti} =$	$\gamma_{00} + \gamma_{10}(\text{time})_{ti}$	$+$	$\epsilon_{ti} \sim N(0, \sigma^2)$ $\rho \sim MVN\left(0, \begin{bmatrix} \tau_{00} & \\ \tau_{10} & \tau_{11} \end{bmatrix}\right)$	$\{\gamma_{00}, \gamma_{10}, \tau_{00}, \tau_{11}, \tau_{10}, \sigma\}$
<b>Latent Class Growth Analysis (LCGA) Model</b> (see notes)	$y_{ti c=k} =$	$\gamma_{0k} + \gamma_{1k}(\text{time})_{ti}$	$+$	$\epsilon_{ti} \sim N(0, \sigma^2)$ $\pi_{i(c=k)} \sim \frac{\exp\{\eta_{ci}\}}{\sum_{k=1}^K \exp\{\eta_{ik}\}}$	$\{\sigma\}$ and $\{\gamma_{0k}, \gamma_{1k}, \pi_{i(c=k)}\}$ for each $k$
<b>Growth Mixture Model</b>	$y_{ti c=k} =$	$\gamma_{0k} + \gamma_{1k}(\text{time})_{ti}$	$+$	$\epsilon_{ti} \sim N(0, \sigma^2)$ $\rho \sim MVN\left(0, \begin{bmatrix} \tau_{00} & \\ \tau_{10} & \tau_{11} \end{bmatrix}\right)$ $\pi_{i(c=k)} \sim \frac{\exp\{\eta_{ci}\}}{\sum_{k=1}^K \exp\{\eta_{ik}\}}$	$\{\sigma\}$ and $\{\gamma_{0k}, \gamma_{1k}, \tau_{00}, \tau_{11}, \tau_{01}, \pi_{i(c=k)}\}$ for each $k$

*Notes:* The “Fixed-Effects” Model refers to the econometric description of a model that accounts for variation across higher-level entities by including an indicator for  $N-1$  entities represented in the equation by  $\delta_i$  (therefore,  $\delta_i$  has  $N-1$  parameters); it *does not* refer to the “fixed” portion (i.e., deterministic component) of the growth models above. In the Latent Class Growth Analysis Model and Growth Mixture Model,  $\eta_{ik}$  represents the log-odds of membership in class  $k$  being drawn using the convention that  $\eta_{iK}$ , the log-odds of the reference category  $K$ , equal 0.