$$egin{aligned} E_{
m Sid} &= \delta + \gamma_{
m Sid} \ &+ eta_{
m AE} A_{
m Sid} + eta_{
m TE[G_{Sid},T_{Sid}]} \mathsf{t} \ \delta &\sim {
m Normal}(0,1.5) \ eta_{
m AE}, eta_{
m TE} &\sim {
m Normal}(0,1) \end{aligned}$$

 $\gamma_{\mathrm{Sid}} \sim Normal(0, au) \ au \sim Normal^+(0, 1)$ 

$$egin{aligned} D_{
m Sid,t}^* &\sim {
m Binomial}(14,P_{
m Sid,t}) \ \log\!\mathrm{it}(P_{
m Sid,t}) &= -D_{
m Sid,t} \ D_{
m Sid,t} &= lpha + eta_{
m TD[T_{
m Sid}]} \mathrm{t} + eta_{
m AD} \mathrm{A}_{
m Sid} + eta_{
m ED} E_{
m Sid,t} \end{aligned}$$

$$a+eta_{ ext{TD}}$$

 $\alpha \sim \text{Normal}(0, 1.5)$ 

 $\beta_{AD}, \beta_{ED} \sim \text{Normal}(0,1)$ 

 $\mu_{\beta_{mp}} \sim \text{Normal}(0,1)$ 

 $\sigma_{\beta_{mp}} \sim \text{Normal}^+(0,1)$ 

$$\alpha + \beta_{\mathrm{TD}}$$

$$+oldsymbol{eta}_{ ext{TD[7]}}$$

 $eta_{ ext{TD}} \sim ext{Normal}(\mu_{eta_{ ext{TD}}}, \sigma_{eta_{ ext{TD}}})$ 

$$eg eta_{ ext{TD[T]}}$$

Sid,t 
$$eta_{mn}$$

$$_{oldsymbol{\mathcal{R}}}^{\mathrm{id,t}}$$

$$egin{aligned} R_{
m Sid,Iid,t} &\sim {
m OrderedLogit}(oldsymbol{\phi}_{
m Sid,Iid,t}, oldsymbol{\kappa}) \ oldsymbol{\phi}_{
m Sid,Iid,t} &= E_{
m Sid,t} + I_{
m Iid} \ oldsymbol{\kappa} &\sim {
m Normal}(0,1) \ I_1 &= -\sum^{N_I} I_i \quad ext{(sum-to-zero)} \end{aligned}$$

 $I_2, I_3, ..., I_{N_I} \sim \text{Normal}(0, \sigma_I)$ 

 $\sigma_I \sim \text{Exponential}(1)$