Observation model

$${y_i}^{p,m} \sim \text{Gamma}\left({\mu_i}^{p,m} \cdot {\beta_i}^{p,m}, {\beta_i}^{p,m}\right)$$

$${\mu_i}^{p,m} \leftarrow \mathcal{F}\left({x_i}^{p,m} \mid a^{p,m}, \Omega^{p,m}\right)$$

$${\beta_i}^{p,m} \leftarrow {c_1}^{p,m} + \frac{{\mu_i}^{p,m}}{{c_2}^{p,m}}$$

Participant specific parameters

$$a^{p,m} \sim \text{TruncatedNormal}\left({\mu_a}^{m}, {\sigma_a}^{m}\right)$$

$$\theta^{p,m} \sim \text{HalfNormal}\left({\sigma_\theta}^{m}\right) \text{ for all } \theta^{p,m} \in \Omega^{p,m}$$

Priors

$${\mu_a}^{m} \sim \text{TruncatedNormal}\left(50, 20\right)$$

$${\sigma_a}^{m} \sim \text{HalfNormal}\left(30\right)$$

$${\sigma_L}^{m} \sim \text{HalfNormal}\left(0.05\right)$$

$${\sigma_\theta}^{m} \sim \text{HalfNormal}\left(5\right) \text{ for all } {\sigma_\theta}^{m} 2{\sigma_b}^{m},^{p,m} \in \Omega^{m}$$

$$\Omega^{p,m} \leftarrow \{b^{p,m}, v^{p,m}, L^{p,m}, \ell^{p,m}, H^{p,m}, {c_1}^{p,m}, {c_2}^{p,m}\}$$

$$\Omega^{m} \leftarrow \{{\sigma_b}^{m}, {\sigma_v}^{m}, {\sigma_\ell}^{m}, {\sigma_H}^{m}, {\sigma_{c_1}}^{m}, {\sigma_{c_2}}^{m}\}$$