$$x_{ij} \sim \text{Categorical}\left(\mathbf{P}(x_{ij} \mid \boldsymbol{d}_j, \theta_i, a_j)\right) = \text{Categorical}\left(P(x_{ij} = 1 \mid \theta_i, \boldsymbol{d}_j, a_j), \cdots, P(x_{ij} = 5 \mid \theta_i, \boldsymbol{d}_j, a_j)\right)$$

$$a_j \sim \text{Normal}^{+}(\mu_a, \sigma_a^2)$$

$$\theta_i \sim \text{Normal}(0, 1)$$

$$d_{jk} \sim \begin{cases} -\infty, & \text{if } k = 1 \\ \text{Normal}(\mu_{d_{j2}}, \sigma_{d_{j2}}^2), & \text{if } k = 2 \\ \text{Normal}^{>d_{j(k-1)}}(\mu_{d_{jk}}, \sigma_{d_{jk}}^2), & \text{if } k > 2 \end{cases}$$