$$
\begin{aligned}
\mathbf{z} &\sim \text{Categorical-MRF}(\zeta) \\
\tau^2_{\gamma_1}, \ldots, \tau^2_{\gamma_K}, \tau^2_\beta &\sim S_0 \\
\mu_1, \ldots, \mu_K &\sim \mathcal{N}_K(0, 1) \\
\gamma_g \mid z_g, \boldsymbol{\mu}, \boldsymbol{\tau}_\gamma &\sim \mathcal{N}(\mu_{z_g}, \tau^2_{\gamma_{z_g}}) \\
\beta_{gc} \mid \gamma_g, \tau_\beta &\sim \mathcal{N}(\gamma_g, \tau^2_\beta) \\
y_{gc} \mid \beta_{gc} &\sim \mathbb{P}\left(h\left(\beta_{gc}\right)\right)
\end{aligned}
$$