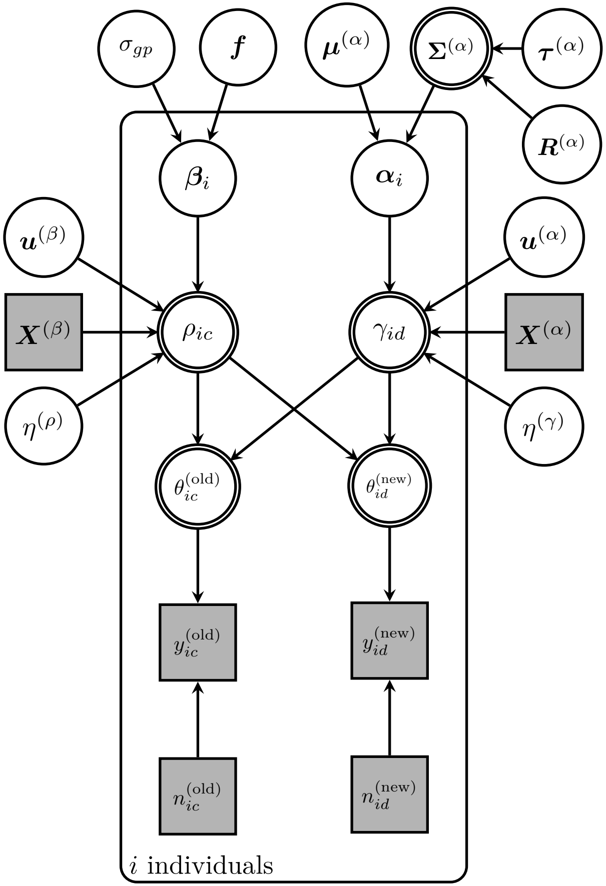

$$
\begin{aligned}
\ell &\sim \text{invGamma}(5,5) \\
\tau_{gp} &\sim \text{invGamma}(5,5) \\
k(x|\tau_{gp},\ell) &= \tau_{gp}\cdot\left(1+\frac{\sqrt{3}\|x-x'\|}{\ell}\right)\exp\left(-\frac{\sqrt{3}\|x-x'\|}{\ell}\right) \\
f_j(x) &\sim \text{MvNormal}(\mathbf{0}, k(x|\tau_{gp},\ell)),\ \ j\in\{1{:}6\} \\
\sigma_{gp} &\sim \text{Gamma}(5,10) \\
\mu_1^{(\alpha)} &\sim \text{Normal}(-0.8, 1.5) \\
\mu_2^{(\alpha)} &\sim \text{Normal}(0,1) \\
\tau_j^{(\beta)} &\sim \text{Gamma}(5,10),\ \ j\in\{1{:}6\} \\
\tau_k^{(\alpha)} &\sim \text{Gamma}(5,10),\ \ k\in\{1,2\} \\
\boldsymbol{R}^{(\alpha)} &\sim \text{LKJcorr}(2),\ \ \boldsymbol{R}^{(\alpha)}\in\mathbb{R}^{2\times 2} \\
\boldsymbol{\Sigma}^{(\alpha)} &= \text{diag}(\boldsymbol{\tau}^{(\alpha)})\cdot\boldsymbol{R}^{(\alpha)}\cdot\text{diag}(\boldsymbol{\tau}^{(\alpha)}) \\
\boldsymbol{\beta}_i &\sim \text{MvNormal}(\boldsymbol{f}(x_i),\ \text{diag}(\sigma_{gp})^2),\ \ \boldsymbol{\beta}_i\in\mathbb{R}^{6\times 1} \\
\boldsymbol{\alpha}_i &\sim \text{MvNormal}(\boldsymbol{\mu}^{(\alpha)},\ \boldsymbol{\Sigma}^{(\alpha)}),\ \ \boldsymbol{\alpha}_i\in\mathbb{R}^{2\times 1} \\
\omega_j^{(\beta)},\ \omega_k^{(\alpha)} &\sim \text{Uniform}(0.01, 0.4),\ \ j\in\{1{:}6\},\ \ k\in\{1,2\} \\
u_{j[study]}^{(\beta)} &\sim \text{Normal}(0,\omega_j^{(\beta)}),\ \ study\in\{1{:}4\} \\
u_{k[study]}^{(\alpha)} &\sim \text{Normal}(0,\omega_k^{(\alpha)}),\ \ study\in\{1{:}4\} \\
\boldsymbol{u}_{[study]}^{(\beta)},\ \boldsymbol{u}_{[study]}^{(\alpha)} &= [u_{1[study]}^{(\beta)},\ldots,u_{6[study]}^{(\beta)}]^\top,\ [u_{1[study]}^{(\alpha)},u_{2[study]}^{(\alpha)}]^\top \\
c &= \begin{cases} 1,2,3 & \text{for phases 1–3}^{(\text{CS}-)} \\ 4,5,6 & \text{for phases 1–3}^{(\text{CS}+)} \end{cases} \\
d &= 1 \text{ for CS}-,\ 2 \text{ for CS}+ \\
w_c,\ w_d &= \begin{cases} -1/2 & \text{if } c,d\in\{\text{animals}\} \\ \ \ 1/2 & \text{if } c,d\in\{\text{tools}\} \end{cases} \\
\eta^{(\rho)},\ \eta^{(\gamma)} &\sim \text{Normal}(0,1) \\
\text{logit}(\rho_{ic}) &= \boldsymbol{X}_c^{(\beta)}\cdot(\boldsymbol{\beta}_i+\boldsymbol{u}_{[study]}^{(\beta)})+w_c\ \eta^{(\rho)},\ \ \boldsymbol{X}_c^{(\beta)}\in\mathbb{R}^{1\times 6} \\
\text{logit}(\gamma_{id}) &= \boldsymbol{X}_d^{(\alpha)}\cdot(\boldsymbol{\alpha}_i+\boldsymbol{u}_{[study]}^{(\alpha)})+w_d\ \eta^{(\gamma)},\ \ \boldsymbol{X}_d^{(\alpha)}\in\mathbb{R}^{1\times 2} \\
\theta_{ic}^{(\text{old})} &= \begin{cases} \rho_{ic}+(1-\rho_{ic})\ \gamma_{i1}, & c\in\{1,2,3\} \\ \rho_{ic}+(1-\rho_{ic})\ \gamma_{i2}, & c\in\{4,5,6\} \end{cases} \\
\theta_{id}^{(\text{new})} &= \begin{cases} (1-\rho_{i1}\ \rho_{i2}\ \rho_{i3})\ \gamma_{i1} & \text{if } d=1 \\ (1-\rho_{i4}\ \rho_{i5}\ \rho_{i6})\ \gamma_{i2} & \text{if } d=2 \end{cases} \\
y_{ic}^{(\text{old})} &\sim \text{Binomial}(\theta_{ic}^{(\text{old})}, n_{ic}^{(\text{old})}),\ \ c\in\{1{:}6\} \\
y_{id}^{(\text{new})} &\sim \text{Binomial}(\theta_{id}^{(\text{new})}, n_{id}^{(\text{new})}),\ \ d\in\{1,2\}
\end{aligned}
$$