1. BORAL MODEL

site i
species j
latent factor k

Y_{ij} is true occurrence, assuming perfect detection
Φ: CDF of standard normal

$$Y_{ij} \sim Bern(\Phi(v_{ij}))$$
$$v_{ij} = \eta_{i.}\lambda_{.j}$$
$$\eta_{i.} \sim MVN(0, I_K)^*$$
$$\lambda_{j,k} \sim N(0, 10)$$

*considered the random effects
Think of $\lambda_{k,j}$ as species-specific coefficients for unobserved covariates $\eta_{i.}$ at the site level. They introduce correlation between species: $v_{i.} \sim MVN(0, \Lambda\Lambda')$.
   Note: ignoring fixed effects of observable covariates for now