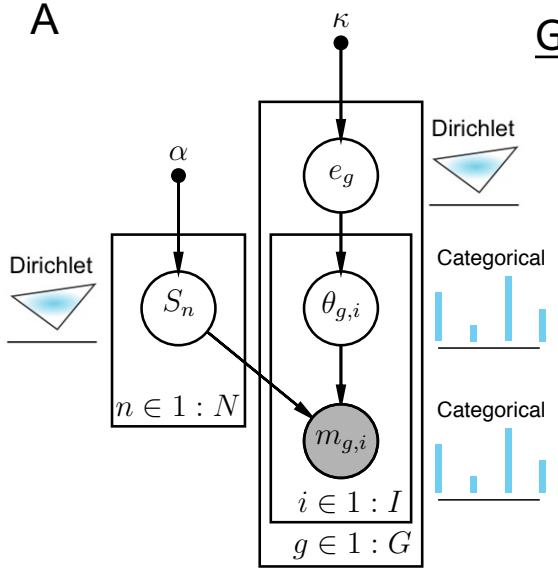
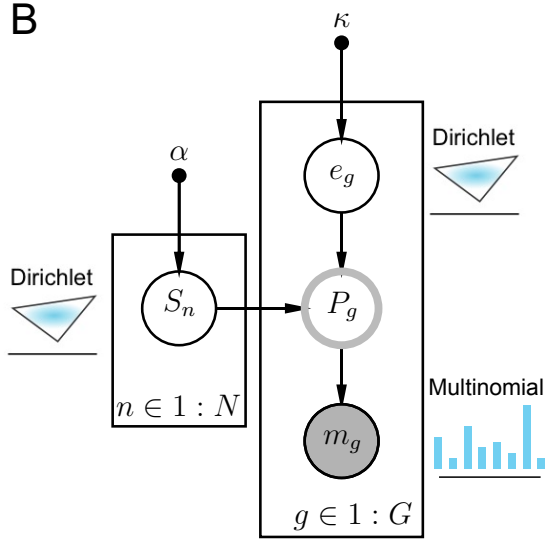
A



Generative mutational model

$$e_g \sim \mathrm{Dir}(\kappa)$$
$$S_n \sim \mathrm{Dir}(\alpha)$$
$$\theta_{g,i} \sim \mathrm{Cat}(e_g)$$
$$m_{g,i} \sim \mathrm{Cat}(S_n | \theta_{g,i} = n)$$

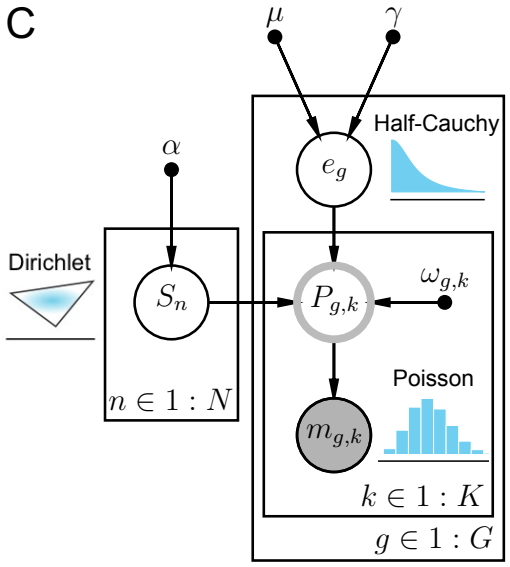
B



NMF model

$$e_g \sim \mathrm{Dir}(\kappa)$$
$$S_n \sim \mathrm{Dir}(\alpha)$$
$$P_{g,k} = \sum_n e_{g,n} S_{n,k}$$
$$m_g \sim \mathrm{Mult}(P_g | E, S)$$

C



EMu model

$$e_g \sim \mathrm{HalfCauchy}(\mu, \gamma)$$
$$S_n \sim \mathrm{Dir}(\alpha)$$
$$P_{g,k} = \omega_{g,k} \times \sum_n e_{g,n} S_{n,k}$$
$$m_{g,k} \sim \mathrm{Pois}(P_{g,k} | \omega, E, S)$$

Legend

- Fixed value
- Random variable
- Observed data
- Deterministic value
- Dependency
- Probability distribution (Poisson)
- Plate – indicates repeated elements within the model