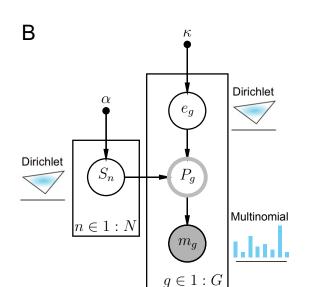


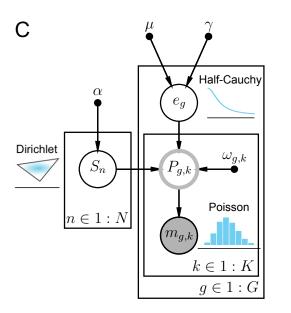
NMF Generative model

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



NMF Inferential model

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



EMu model

 $e_g \sim \text{HalfCauchy}(\mu, \gamma)$

$$S_n \sim \text{Dir}(\alpha)$$

$$P_{g,k} = \omega_{g,k} \times \sum_{n} e_{g,n} S_{n,k}$$

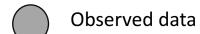
$$m_{g,k} \sim \text{Pois}(P_{g,k} | \omega, E, S)$$

$$m_{g,k} \sim \text{Pois}(P_{g,k} | \omega, E, S)$$

Legend

Fixed value





Deterministic value



Dependency



Probability distribution



Plate – indicates repeated elements within the model