

$$\text{beta}(a, b) \rightarrow \text{beta}(\underbrace{w(K-2)+1}_a, \underbrace{(1-w)(K-2)+1}_b)$$

$w \in (0, 1)$   
 $K \in (\geq 0)$

hyperpriors  $\text{beta}(\alpha, \beta_w)$   $\gamma(w, R)$   $\gamma(w', R')$   
 $\downarrow$   $\downarrow$   $\downarrow$   
 $\gamma(w, R_k)$   $\gamma(w'', R'')$

Overall  $\text{beta}(w, K)$

Position  $\text{beta}(w^p, K^p)$   $\text{beta}(w^c, K^c)$

