

$$\pi(\theta|y) \propto_{\theta} \pi(y|\theta) \pi(\theta)$$

$$\propto_{\theta} \theta^y (1-\theta)^{n-y} \theta^{\alpha-1} (1-\theta)^{\beta-1}$$

$$= \theta^{\alpha+y-1} (1-\theta)^{\beta+n-y-1}$$

$$\propto_{\theta} \text{BETA}(\theta; \alpha+y, \beta+n-y)$$