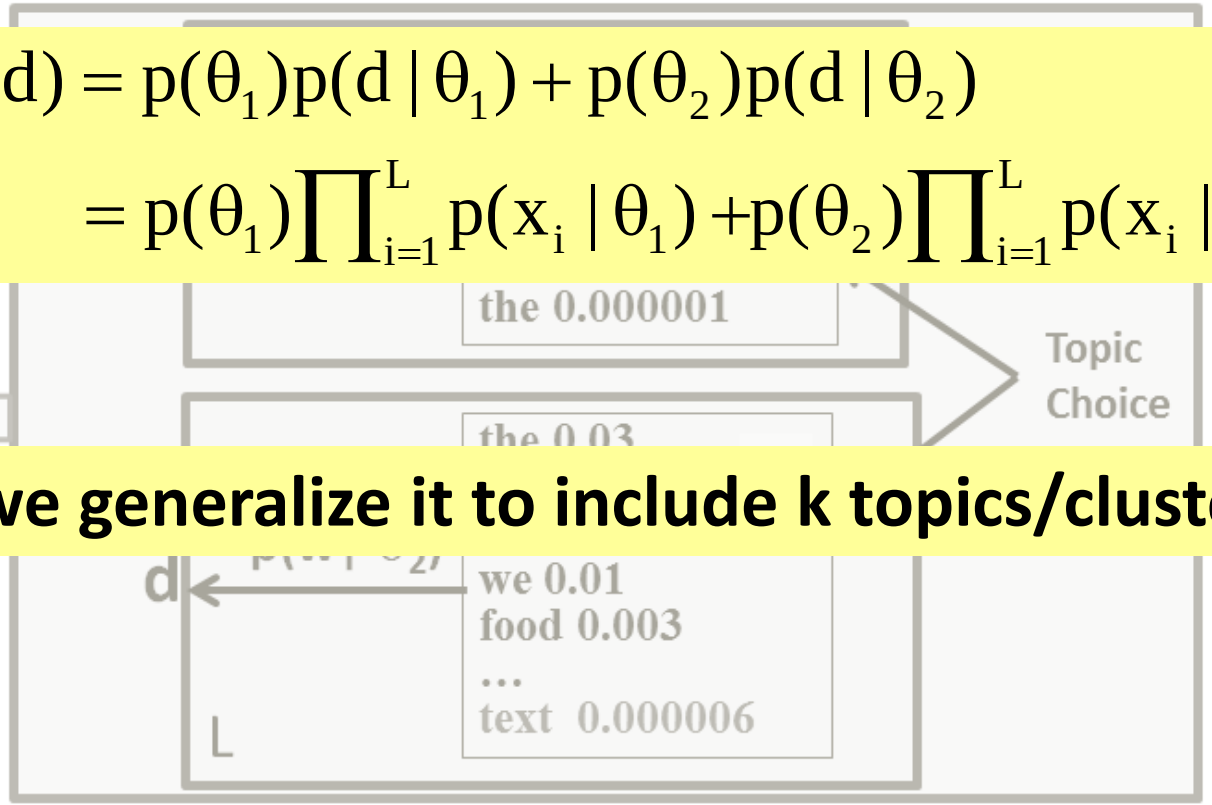
Likelihood Function: p(d)=?

$$p(d) = p(\theta_1)p(d \mid \theta_1) + p(\theta_2)p(d \mid \theta_2)$$
$$= p(\theta_1)\prod_{i=1}^{L} p(x_i \mid \theta_1) + p(\theta_2)\prod_{i=1}^{L} p(x_i \mid \theta_2)$$

$d=x_1\ x_2 \ldots x_L$



How can we generalize it to include k topics/clusters?