# Generating Text with Multiple Topics: p(w)=?

$$\sum_{i=1}^{k} \pi_{d,i} = 1$$

$(1-\lambda_B)p(\theta_1)\ p(w|\theta_1)$ — $p(w|\theta_1)$ — **Topic $\theta_1$** — government 0.3 / response 0.2 / ... — $p(\theta_1)=\pi_{d,1}$

+

$(1-\lambda_B)p(\theta_2)\ p(w|\theta_2)$ — $p(w|\theta_2)$ — **Topic $\theta_2$** — city 0.2 / new 0.1 / orleans 0.05 / ... — $p(\theta_2)=\pi_{d,2}$

+

**W** ...

+

$(1-\lambda_B)p(\theta_k)\ p(w|\theta_k)$ — $p(w|\theta_k)$ — **Topic $\theta_k$** — donate 0.1 / relief 0.05 / help 0.02 / ... — $p(\theta_k)=\pi_{d,k}$

$1-\lambda_B$

**Topic Choice**

+

$\lambda_B\ p(w|\theta_B)$ — $p(w|\theta_B)$ — **Background $\theta_B$** — the 0.04 / a 0.03 / ... — $p(\theta_B)=\lambda_B$

5