

Behavior of a Mixture Model

$d =$ text the

Likelihood:

$$P(\text{"text"}) = p(\theta_d)p(\text{"text"} | \theta_d) + p(\theta_B)p(\text{"text"} | \theta_B) \\ = 0.5 * p(\text{"text"} | \theta_d) + 0.5 * 0.1$$

$$P(\text{"the"}) = 0.5 * p(\text{"the"} | \theta_d) + 0.5 * 0.9$$

$$p(d | \Lambda) = p(\text{"text"} | \Lambda) p(\text{"the"} | \Lambda) \\ = [0.5 * p(\text{"text"} | \theta_d) + 0.5 * 0.1] \times \\ [0.5 * p(\text{"the"} | \theta_d) + 0.5 * 0.9]$$

How can we set $p(\text{"text"} | \theta_d)$ & $p(\text{"text"} | \theta_d)$ to maximize it?

Note that $p(\text{"text"} | \theta_d) + p(\text{"the"} | \theta_d) = 1$

