

$$P_{Bj} = \lambda \prod_{i=1}^M M_1(\varphi_{ij}) + (1-\lambda) \prod_{i=1}^M M_2(\varphi_{ij})$$

$$P_B = \prod_{j=1}^N P_{Bj}$$

Between

$$P_{Wj} = \prod_{\substack{j=1 \\ i=1}}^{N,M} \left[ M_1(\varphi_{ij}) + (1-\lambda) M_2(\varphi_{ij}) \right]$$

Within

$$L_B = \sum_{j=1}^N \log \left[ e^{\log \lambda + \sum L_1(\varphi_{ij})} + e^{\log(1-\lambda) + \sum L_2(\varphi_{ij})} \right]$$

$$L_W = \sum_{j=1}^N \sum_{i=1}^M \log \left[ e^{\log \lambda + L_1(\varphi_{ij})} + e^{\log(1-\lambda) + L_2(\varphi_{ij})} \right]$$