

# Uncertainty in Probability of Success

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Experiment with unknown probability of success  $p$   
Prior distribution is uniform (1) over interval  $[0, 1]$   
Conduct experiments, obtain  $j$  successes and  $k$  failures  
New distribution is  $p^j(1-p)^k$  (normalized to have integral 1)  
Mean is  $\frac{j+1}{j+k+2}$ : as if