

# conditional probabilities & bayes' rule

2015 Gallup poll on use of online dating sites:

		Age				
		18-29	30-49 <i>B</i>	50-64	65+	Total
Used online dating site	Yes <i>A</i>	60	86	58	21	225
	No	255	426	450	382	1513
Total		315	512	508	403	1738

Bayes' rule:

$$P(A \mid B) = \frac{P(A \& B)}{P(B)}$$

% of 30-49 year olds using online dating sites =

$$\frac{86}{512} \approx 0.17$$

*A&B*      *B*

*P(use online dating site | 30-49 year old)*



# Bayes' rule



Thomas Bayes  
(1702 – 1761)



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$$\begin{aligned}
 & P(\text{use online dating site} \mid 30\text{-}49 \text{ year old}) = \\
 &= \frac{P(\text{use online dating site \& 30-49 year old})}{P(30\text{-}49 \text{ year old})} \\
 &= \frac{86 / 1738}{512 / 1738} = \frac{86}{512} \approx 0.17
 \end{aligned}$$