

ASSOCIATION vs INDEPENDENCE:

"WOULD I CHANGE MY MIND IF I KNEW MORE?"

YES- there is association present.
If knowing more causes the prob. to increase or decrease, there is association.

NO- there is no association present.
If knowing more does not cause the prob. to increase or decrease, there is no association.

USEFUL PROBABILITY PAIRS to find INDEPENDENCE

vs ASSOCIATION:

$P(A|B)$ $P(B|A)$ $P(NA|B)$ $P(NB|A)$
 $P(NA|B)$ $P(NB|A)$ $P(NA|NB)$ $P(NB|NA)$

EXAMPLE PROBLEM (from Desmos)

	Dog	No Dog	Total
Truck	95	85	180
No Truck	25	45	70
Total	120	130	250

$$P(D|T) = \frac{95}{180}$$

$$P(ND|T) = \frac{85}{180}$$

← more likely, there is association

OTHER NOTES:

- correlation \neq causation
- association: $P(A) \neq P(A|B)$
- independence: $P(A) = P(A|B)$