

CONDITIONAL EVENT PROBABILITY

Why

Given that we know that one event has occured, we want language for what the new probabilities should be.¹

Definition

Consider two events, the second of which has non-zero probability. The *conditional probability* of the first event *conditioned* on a second event is the result of dividing the probability of the second event into the probability of the intersection of the two events.

Notation

Let **P** be the event probability function. Let A and B be two events with $\mathbf{P}(B) \neq 0$. We denote the conditional probability of A conditioned on B by $\mathbf{P}(A \mid B)$; defined by

$$\mathbf{P}(A \mid B) = \frac{\mathbf{P}(A \cap B)}{\mathbf{P}(B)}.$$

¹Future editions will improve.

