

In the **Bayesian (or epistemological) interpretation**, probability measures a “degree of belief.” Bayes’ theorem then links the degree of belief in a proposition before and after accounting for evidence. For example, suppose it is believed with 50% certainty that a coin is twice as likely to land heads than tails. If the coin is flipped a number of times and the outcomes observed, that degree of belief may rise, fall or remain the same depending on the results.

$$P(A|B) = \frac{P(B|A) P(A)}{P(B)}.$$

For proposition A and evidence B ,

- $P(A)$, the *prior*, is the initial degree of belief in A .
- $P(A|B)$, the *posterior* is the degree of belief having accounted for B .
- the quotient $P(B|A) / P(B)$ represents the support B provides for A .

Intuition

$P(B|A) P(A) = P(A, B)$: the probability of A and B occur simultaneously.

$P(B|A) P(A) / P(B)$: out of all B events, the probability that you see B and A both occur, which can be explained as the probability of seeing A occur when B occurs, which is exactly $P(A|B)$.