**Bayesian Statistics**

Using ‘Bayes Theorem’ in Bayesian statistics, we’re usually thinking about the diachronic interpretation. Diachronic is greek term for ‘through time,’ the idea is that you have some hypothesis, you observe some data, you use the data to update what you believe about the world in time. In other words, it’s what you believed before seeing the data, then what you believe after seen the data.

Rewriting Bayes’s theorem with H and D yields:

In this interpretation, each term has a name:

* is the probability of the hypothesis before we see the data, called the prior probability, or just **prior**.
* is what we want to compute, the probability of the hypothesis after we see the data, called the **posterior**.
* is the probability of the data under the hypothesis, called the **likelihood**.
* is the probability of the data under any hypothesis, called the **normalizing constant**

Sometimes we can compute the prior based on background information. For example, the cookie problem specifies that we choose a bowl at random with equal probability.

In other cases the prior is subjective; that is, reasonable people might disagree, either because they use different background information or because they interpret the same information differently.