

Princeton Philosophical Society: Truth and Philosophy

Let's begin with a few basic assumptions to guide and motivate the argument.

- (1) There exists an external world that has properties which are mind-independent -- that is, existing independently of us
- (2) We have a particular mental image of the world and its properties, which may or may not accurately correspond to the actual world
- (3) At least some of our beliefs originated within us; that is, they existed prior to our perception of the world

None of these assumptions are particularly controversial. We might perhaps object to (3) by arguing for radical empiricism; that is, by saying that all of our beliefs come by way of a rational faculty of mind interpreting our sense-impressions (that is, our evidence). However, this view has been thoroughly rejected by modern psychologists, who argue that at least some of our beliefs derive from the original structure of our brain.¹

Given these three premises, what can we say? Let us first specify some variables. Let R be the remission of the cancer. Let G be the belief that god exists. Note that $P(X)$ is the probability that event X obtains, and $P(X|Y)$ is the probability that X obtains given that Y obtains.

Suppose now that we have an individual (call him Jones). Jones, like all of us, has certain beliefs about the world. In particular, he believes with 95% confidence that god exists (i.e. $P(G) = 0.95$); he believes with 75% confidence that god will save cancer patients that are prayed for (i.e. $P(R|G) = 0.75$); and he believes with 99.5% confidence that the cancer patients would *not* spontaneously remiss in the absence of god, even if they ate turnips grown under a certain planetary alignment (i.e. $P(R|\sim G) = 0.005$ -- extremely unlikely).

Suppose also that we have an individual named Smith. Smith believes with 95% confidence that god does *not* exist; he believes with 75% confidence that god will save cancer patients that are prayed for; and he believes with 80% confidence that cancer patients would spontaneously remiss in the absence of god, given that they ate turnips grown under a certain planetary alignment.

To formally model how we should modify our beliefs in response to any piece of evidence, we use

Bayes' theorem:
$$P(F_j | E) = \frac{P(E | F_j)P(F_j)}{\sum_{i=1}^n P(E | F_i)P(F_i)}$$
. That is, the confidence we have in belief F_j , given

the occurrence of event E , is the probability of E given F_j multiplied by the prior confidence we have in F_j , all divided by the summed conditional probabilities of other possible beliefs we may hold given the occurrence of E multiplied by the prior probability of these beliefs.²

¹ For a historical perspective on the status of innate beliefs in philosophy, see here: <http://plato.stanford.edu/entries/innateness-history/>

² For more information on Bayes' theorem, one of the most important results in epistemology, decision theory, and the philosophy of science, see here: <http://plato.stanford.edu/entries/bayes-theorem/>

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The formulation for how their confidence in the existence of god should change is the following,

$$\text{then: } P(G | R) = \frac{P(R | G)P(G)}{P(R | G)P(G) + P(R | \sim G)P(\sim G)}$$

Thus, for Jones, $P(G|E) = 0.9996$ (the calculation is left to the reader). Jones should now believe in god with increased confidence. For Smith, $P(G|E) = 0.047$ (again, the calculation is left to the reader). Directly contrary to Jones, Smith should now believe in god with even *less* confidence. That is, the *exact* same evidence leads to a diverge in beliefs, rather than a convergence.

Quine proposed the most general form of this problem, calling it epistemic underdetermination. He noted that for every set of evidence, there are an effectively infinite number of theories that fit it. Thus, the belief we ultimately end up with, given the evidence, is fully contingent upon our prior beliefs. Given different priors, we might well end up with different beliefs. This affects every single belief we might have.

We might, of course, object that science doesn't seem to suffer from this problem in practice. This is, to an extent, true. The variety, specificity, and strength of empirical evidence in the sciences, combined with our very similar intuitions about the physical world, lead to a striking convergence in scientific belief. Yet even science is not immune to the problem. A striking modern day example of underdetermination is quantum physics, where a variety of interpretive theories fit the evidence exactly the same but offer very different descriptions of the world. Worse, many of these theories cannot be distinguished by *any* evidence we might acquire.

Epistemic underdetermination is especially acute for philosophy, though. It frequently seems that disagreements over philosophical issues come down to disagreements over intuitions, given the sparse available empirical evidence. For instance, consider the example of the existence of objective morality (defined as categorical reasons for action). Jones may begin with the belief that categorical reasons exist. To him, just as the real world exists, so do categorical reasons. Smith, on the other hand, may begin with the belief that categorical reasons are nonsense. There is really no evidence to show which one is correct and which one is wrong. They are both justified in continuing to believe as they do, and neither can sure (or even confident!) that they are right and the other is wrong.