

**Why is it that Bayes' rule has not only captured the attention of so many people but inspired a religious devotion and contentiousness, repeatedly across many years?**

*From a comment on Sharon McGrayne's draft book:*

Mathematical scientists often sense a combination of harmony and power in certain formulas. There is at once a deep esthetic experience and a pragmatic recognition of profound consequences, leading to what Einstein called, "the cosmic religious feeling." Bayes' Theorem gives such a formula. It says there is a simple, elegant way to combine current information with prior experience in order to state how much is known. It implies that sufficiently good data will bring previously disparate observers to agreement. It makes full use of available information, and it produces decisions having the least possible error rate. Bayes' Theorem is awe-inspiring, but when people are captivated by its spell they tend to proselytize, and become blinded to its fundamental vulnerability: although most great equations of science are descriptive, the Bayesian use of Bayes' Theorem is different, it is *prescriptive*—suggesting how scientific inference should be done—and it requires strong assumptions; its magical powers depend on the validity of its probabilistic inputs. Just as other forms of religious zealotry have always found combative foes, sometimes even those whose main objection seems to be the zealotry itself, so Bayesianism has, over many, many years joined the battle with the non-believers. The modern view is, thankfully, much more civilized. Bayes' theorem is widely recognized as a crucial tool for data analysis and machine learning. But Bayesianism as an all-encompassing panacea has been sidelined in the name of progress. Religiosity, on both sides, has subsided.

*And, concerning the success of Bayesian inference, a quote from her book:*

Bayes' rule is influential now in ways its pioneers could never have envisioned, Rob Kass emphasizes. "Neither Bayes nor Laplace recognized a fundamental consequence of their approach, that the accumulation of data makes open-minded observers come to agreement and converge on the truth. Harold Jeffreys, the modern founder of Bayesian inference for scientific investigation, did not appreciate its importance for decision-making. And the loyalists of the 1960s and 1970s failed to realize that Bayes would ultimately be accepted not because of its superior logic but because probability models are so marvelously adept at mimicking the variation in real-world data."