

Research argues that Occam's razor is an 'essential factor that distinguishes science from superstition'

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Occam's razor—the principle that when faced with competing explanations, we should choose the simplest that fits the facts—is not

just a tool of science. Occam's razor is science, insists a renowned molecular geneticist from the University of Surrey.

In a paper published in the *Annals of the New York Academy of Sciences*, Professor John Joe McFadden argues Occam's razor—attributed to the Surrey-born Franciscan friar William of Occam (1285–1347)—is the only feature that differentiates science from superstition, pseudoscience or [fake news](#).

Professor McFadden said, "What is science? The rise of issues such as [vaccine hesitancy](#), climate skepticism, [alternative medicine](#), and mysticism reveals significant levels of distrust or misunderstanding of science among the general public. The ongoing COVID inquiry also highlights how scientific ignorance extends into the heart of government. Part of the problem is that most people, even most scientists, have no clear idea of what science is actually about."

Factors often cited as being the essence of science, such as experimentation or mathematics, are widely used in disciplines as diverse as gardening, accounting, cooking or astrology. Alchemists performed thousands of experiments attempting to transform base metal into gold but got nowhere, whereas astrologers use mathematics to calculate horoscopes. Neither is considered science. But why?

William of Occam insisted that science is the search for the simplest solutions. Occam's razor was adopted by Copernicus, Kepler, Galileo and Newton to argue that Earth orbits the sun, not the other way around, because it is simpler. They used the razor to clear a path through mysticism, superstition, and religion to found [modern science](#). The razor continues to be invaluable, helping to predict—for example—the Higgs boson.

Professor McFadden continued, "Whereas practitioners of mysticism,

alternative medicine, pseudoscience or fake news can invent spirits, demons conspiracies or Elvis on the moon, to make sense of their world, scientists will always adopt the simplest solution to even the most complex problems. That is the beauty of Occam's razor."

"While mysticism, alternative medicine, and fake news often resort to elaborate explanations like spirits or moon-landing conspiracies, scientists seek the simplest solutions to complex problems. Today's world, riddled with pseudoscience and misinformation, partly stems from a poor grasp of science."

"Often taught as a jumble of obscure theories and complex equations, science can overwhelm students, driving them away. However, portraying [science](#) as a method to find simple explanations for our world's complexities, using experimentation, mathematics, and logic, could make it accessible to all, including politicians."

More information: Johnjoe McFadden, Razor sharp: The role of Occam's razor in science, *Annals of the New York Academy of Sciences* (2023). [DOI: 10.1111/nyas.15086](https://doi.org/10.1111/nyas.15086)

Provided by University of Surrey

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