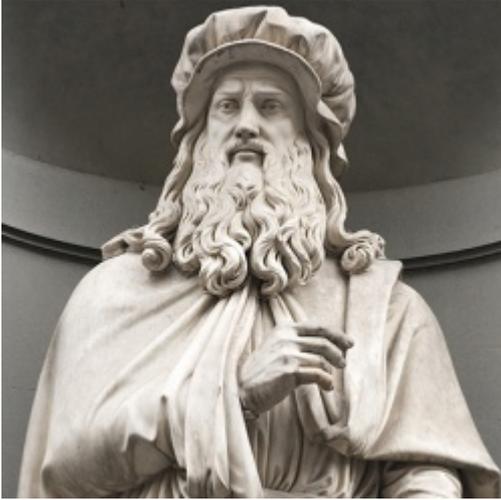


Science Skepticism: It Takes a Village of Concerns



By *Chuck Dinerstein* — October 11, 2018



The G man

He was an old man now, and after many years of bickering and infighting, he was called to account for his beliefs. In what was the first in a series of confrontations for science, Galileo recanted his view about the Earth's movement; although it is believed that he muttered "yet it does move" as he faced house arrest for his remaining days. Fast forward to our times. "Climate deniers are right-wing nuts," "Tree huggers fear genetically modified foods." If you nodded your head to either of these statements, then you are using stereotypes to define science skepticism.

A study entitled [Not all skepticism is equal](#) by Bastiaan T. Rutjens et al. published in *Personality, and Social Psychology Bulletin* delves deeper into what fuels skepticism about science. The long adversarial history of religion and science is relatively easy to understand. Both these belief systems provide all-encompassing explanations – evolution or Adam and Eve? Another absolute belief system, lying somewhere between secular and religious is the view that purity and natural are innately good, and nature provides a moral framework. Like politics and religion, morality is absolute; there are no negotiations.

The difficulty in understanding science skepticism is that we frequently reduce disbelief to unidimensional categories. But our political, religious and moral views are entangled; conservative politics frequently travels with religious conservatism or orthodoxy, social liberalism often accompanies moral beliefs about society despoiling nature. The confounding makes it difficult to identify their separate contributions to skepticism of science.

The authors, instead, considered demographics, political beliefs, moral views, the orthodoxy of our religious faith as well as our faith in science and scientific literacy and provide a more nuanced picture of the factors that contribute to science skepticism. Before jumping into their findings be aware that cumulatively these factors predict about 30% of the respondent's answers so that the

study does not entirely define the factors we weigh in our skepticism or belief. And some political bias may be present in a study that describes political beliefs as measures of conservatism rather than liberalism.

It should be no surprise that the pathways to science-faith or skepticism varied for each individual. In their pilot study, they asked people their belief regarding four scientific statements, two medical facts, and two more contentious thoughts:

- HIV causes AIDS
- Smoking causes lung cancer
- Human CO₂ emissions cause climate change
- Vaccination causes autism [1]

Science illiteracy was the predominant reason for skepticism in every instance. But not the only reason. For climate change, more conservative political views were another significant factor. A substantial factor in skepticism about vaccines was a greater religious orthodoxy. So it was clear from the pilot study, the skepticism about science has many factors. The authors performed three more studies looking at these same scientific beliefs, increasingly refining the definitions of political ideology, moral beliefs, religious and scientific faith.

They found that science skepticism is not merely a yes or no decision. But skeptics bring varying concerns to bear depending upon the science being considered. They found the factors shaping science skepticism included

- Science literacy was the only reason that individuals were skeptical of the connection of HIV with AIDS and smoking with lung cancer. Ideology played no role.
- The combination of religious orthodoxy, political viewpoints and demographics were the strongest predictors of skepticism, but only accounted for 20% of the variation in beliefs.
- Religious orthodoxy was the best predictor of both science skepticism and a lack of faith in science [2]
- Political conservatism and faith in science were the factors most predictive of views of climate change - political conservatism outweighing any balancing from faith in science.
- The balancing of religious orthodoxy, an associated lack of faith in science and concerns about moral "purity" predicted believing in a linkage between vaccines and autism.
- Concerns about GM foods were best predicted by the gender of the individual (female), scientific illiteracy and a low faith in science.

It seems clear that the beliefs fueling science skepticism are heterogenous – consideration of one factor is inadequate. Furthermore, the factors not only traveled together but interact, at times acting synergistically, at other times canceling one another out – science skepticism or belief representing the balance. The authors concluded

"This corroborates our reasoning that it is essential to include the full range of ideological, moral, and literacy measures and gauge their relative weight when investigating science skepticism."

This week another study of the reasons for science skepticism concerning vaccination was published in *Nature Human Behavior*, [Association of moral values with vaccine hesitancy](#). Unlike

the previous research, the work focused solely on the moral component. They focused on this element because “An opinion commonly expressed by [anti-vaccination websites] is that vaccines are unnatural and ... that vaccines contain ‘contaminants.’ These concerns may be rooted in the purity moral foundation... Another frequent message ... is that mandatory vaccination policies violate parental civil liberties...”

They found that concerns about “purity” impact both groups that were moderately or greatly hesitant to vaccinate. But for those that were greatly hesitant, moral concerns about liberty and a distrust of authority were also significant factors. So again, there are nuances in our beliefs that have yet to be fully identified.

[1] The results were scored in such a way that “Vaccines do not cause autism” would be a more appropriate phrasing.

[2] It seems that the battle between the Inquisition and Galileo continues to this day

Source: [Not all skepticism is equal: Exploring the ideological antecedents of science acceptance and rejection](#) ^[1]

[Association of moral values with vaccine hesitancy](#) ^[2]

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[1] https://bastiaanrutjens.files.wordpress.com/2017/09/rutjens_sutton_lee_scienceskeptisicm_pspb2017.pdf

[2] <https://www.nature.com/articles/s41562-017-0256-5>