

Commentary

Is this the age of science denialism?



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“Instead of sending my students into a world that celebrates the latest science has to offer, I am delivering them into a society ambivalent, even skeptical, about the fruits of science.” - Adam Frank (physicist), “Welcome to the Age of Denialism”, New York Times Editorial (2013)

Robert Paarlberg, in his book, “Starved for Science”, makes the case for biotechnology in Africa as a tool to increase productivity and enhance economic development. Unfortunately, the science and technology landscape in Africa related to biotechnology seems little changed today from what it was in 2009 when he wrote the book.

Consumers in industrialized countries, particularly in Europe, but in other countries as well, remain skeptical about the safety of genetic engineering to their food. A survey by the American Association for the Advancement of Science (AAAS) and the Pew Charitable Trust in the United States discovered a large discrepancy between what scientists think the state of scientific knowledge is about the causes of climate change and the safety of genetically modified (GM) foods. The survey found that 50% of U.S. adults believe that humans are the cause of climate change, while 87% of scientists subscribe to that view. With respect to GM foods, 37% of adults believe the foods are generally safe compared to 88% of scientists. That’s a 37% knowledge gap for the causes of climate change and a remarkable 51% gap for the safety of GM foods between scientists and the public. If the study were repeated in Europe or other industrialized countries the results would likely be quite similar, though the gap might very well be wider.

In a January 30, 2015 op-ed in the Washington Post, environmental activist and former GM opponent, Mark Lynas, lamented such views, which he referred to as “anti-science attitudes”. These results of the AAAS/Pew study would seem to give credence to the

view that consumers in industrialized countries are becoming more anti-science. Perhaps Adam Frank was right that we live in an age of science denialism.

The outbreak of measles in the United States has brought this debate back into the spotlight. Opponents of vaccinations, sometimes referred to derisively as “anti-vaxxers”, subscribe to the view that vaccines are worse than the diseases they are intended to defend against despite the overwhelming weight of scientific evidence to the contrary. Isn't this proof that denialism is here and entrenched in the mind of the public in industrialized countries?

Fortunately, if we dig deeper we find that the picture is not as bleak as it at first seems. In fact, in many ways, the picture seems almost hopeful when it comes to general American attitudes towards science. For example, the National Science Foundation has looked at American attitudes and support for scientific research over time and found that we are as supportive today, if not more supportive, than we were 30 years ago.

When it comes to rejecting scientific consensus, it seems that it is not so much a problem of being anti-science as it is a problem of ignoring science we do not agree with.

Cognitive science can actually help us to understand why facts sometimes do not seem to matter. It turns out that when there is a conflict between science and our values, our values always win. In these situations we reject the science. To justify such views our brains make up excuses so we can continue to believe what we want to believe.

But don't think that knowing a lot about science (science literacy) offers any immunity to poor judgment about science. To the contrary, one of the surprising conclusions of Yale University professor Dan Kahan's research is that the more science literate we are, the easier it is to justify our false beliefs.

There are a number of ways we do this. One is confirmation bias. We seek out or interpret information in a way that supports our beliefs. It is easy to see this bias at work in others, but we are surprisingly blind to the tendency in ourselves. For example, you may think that you agree with the results of a study because you trust the source, but chances are you trust the source because you agree with the results. That's what Kahan's research shows. Being aware of this tendency towards confirmation bias helps to keep it in check.

In the discussion about vaccines, labeling the parents of unvaccinated children as anti-science -- or worse, “selfish” and “dumb” as some commentators have done -- simply polarizes audiences and makes resolution more difficult.

In June 2014 I spoke to 800 meat scientists at the American Meat Science Association's annual conference in Madison, Wisconsin. I told them, “If people don't trust you, science doesn't matter.” After a brief pause for the point to sink in, I added, “And, if people do trust you, science doesn't matter either.” If we don't trust somebody, we are unlikely to put much stock in their research results. On the other hand, if we do trust somebody, we don't really feel the need to examine their research. We simply accept their conclusions.

The fight over biotechnology in food production is not a fight about science. It is a fight about values. The public will side with the group who most closely reflects their own values. When it comes to controversial topics like climate change and genetically modified foods, scientists need to personalize their stories, acknowledge people's concerns and connect with their audiences if they are to have any hope of building trust. Scientists need to stop telling people what they do, and start telling them why they do it. The science comes later.

Science does matter when it comes to closing the gap between the views of the public and scientists. But it is not the science of climate change or genetic engineering that matters. It is the social sciences and cognitive psychology that will ultimately help close that gap.

Mark Lynas wrote in his op-ed, "scientists also have to be better communicators. With social media, everyone has a megaphone, however well- or ill-informed they are. If scientists want the public to understand their research, they have to spend more time sharing and explaining it to the public."

Building public trust in biotechnology will not be easy. As I often say, people love innovation almost as much as they despise change. The goal when it comes to biotechnology is to demonstrate to the public that a little innovation today will help avert dramatic and tragic change in the future. The first step is to stop calling opponents of biotechnology anti-science. The second step is to find common values and use them as the foundation for a conversation about the challenges we face and the tools we need to address those challenges.