Facts versus feelings isn't the way to think about communicating science

July 6 2017, by John Cook And Sander Van Der Linden

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In a world where "post-truth" was 2016's word of the year, many people are starting to doubt the efficacy of facts. Can science make sense of anti-science and post-truthism? More generally, how can we understand what drives people's beliefs, decisions and behaviors?

Scientists have developed many theories to describe how people process and think about information. Unfortunately, there's an increasing tendency to see people as creatures whose reasoning mechanisms are largely dependent on a narrow set of processes. For example, one popular theory suggests that if we just communicate more accurate information to people, their behavior will change accordingly. Another suggests that people will reject evidence if it threatens their deeply held cultural worldviews and associated feelings.

It's more important than ever that our approach to communication is evidence-based and built on a strong, theoretical foundation. Many of these models contribute valuable insights and can help us design better communication, but each on its own is incomplete. And science communicators have a tendency to oversimplify, focusing on a single model and disregarding other theories.

We suggest that this is a dangerous practice and less effective than a more nuanced and holistic view. The apparent choice between "fact" and "feeling," or between "cognition" and "culture," is a false dilemma. In reality, both are related and address different pieces of the decision-making puzzle.

Thinking versus feeling

One well-known theory about how people absorb new facts is the "information deficit model." The main idea here is straightforward: If you throw more facts at people, they'll eventually come around on an issue.

Most behavioral science scholars agree that this model of human thinking and behavior is clearly incomplete – people rely on a range of other cues besides facts in guiding their attitudes and behavior. For example, sometimes we simply act based on how we feel about an issue.

Unfortunately, the facts don't always convince.

But the term "information deficit" is problematic, too. People tend to have limited information in most areas of life. For example, we often don't know the thoughts and feelings of other people we trust and value. Similarly, we might have limited knowledge about appropriate cultural norms when traveling to a new country, and so on. Information deficit isn't a very meaningful term to use to theorize about human thinking.

Another theory about human thinking is called "cultural cognition." In brief, it suggests that our cultural values and worldviews shape how we think about science and society.

It's easy to be duped into thinking of the human brain as a sponge that soaks up only the information it wants to believe. For example, the theory suggests that people's position on divisive issues such as climate change is not informed by scientific evidence but rather by the strong commitment people have to their political groups and ideologies. The idea is that to protect our cultural worldviews, we actively reject evidence that threatens them – think of someone who fears that government action on climate change undermines the free market.

In short, this narrative sounds appealing on the surface, as humans organize themselves in groups, and much psychological research has shown that we derive part of our social identities from the group affiliations we maintain.

Yet, its focus is overly narrow, and there's a logical fallacy in this conception of human thinking. We belong to many groups at any given time and we juggle many different public and private identities. The real question is about nuance; when and under what conditions is someone motivated to reject scientific facts in favor of their cultural worldview?

Either/or misses the point

To throw all our fact-disseminating eggs into one or the other theoretical basket is oversimplistic and deprives us of important insights.

A more nuanced perspective recognizes that facts and information are embedded in social and cultural contexts. For example, people's perception of expert consensus matters a great deal, especially on contested issues, and is often described as a gateway belief that influences a range of other attitudes about an issue. The near-unanimous consensus that vaccines do not cause autism or that climate change is human-caused are all scientific facts. At the same time, consensus information is also inherently social: It describes the extent of agreement within an influential group of experts.

People often want to be accurate in their views, and, in an uncertain world bounded by limited time and effort, we make strategic bets on what information to take into account. Consensus acts as a natural heuristic, or mental shortcut, for complicated scientific issues. Numerous studies have found that highlighting scientific agreement on human-caused global warming can help neutralize and reduce conflicting views about climate change.

Similarly, while some studies have found a limited effect of knowledge on judgment, when you dig deeper into the data, a more nuanced and insightful picture emerges. For example, some studies claim that a deficit in scientific "knowledge" does not explain why people are divided on contested issues such as climate change. But what's being measured in these experiments matters. Indeed, indicators such as how well people understand numbers or their scientific literacy – which is what some of these studies actually quantify – are categorically different from measuring specific knowledge people have about a topic such as climate change. In fact, a survey across six countries found that when

people understand the causes of climate change, their concern increases accordingly, irrespective of their values. Similarly, other studies show that explanations about the mechanisms of climate change can reduce biased evaluations of evidence as well as political polarization.

In short, facts do matter.

How people think is complex and nuanced

Indeed, there is no need to throw out the baby with the bathwater. Instead, we need to dispel false dichotomies and folk psychology about human thinking that currently dominate the media. Repeating the story that people don't care about facts runs the risk of becoming a self-fulfilling prophecy. A holistic view acknowledges that people rely on cognitive shortcuts and emotions, care about social norms and group identities and are sometimes motivated in their reasoning, but it also recognizes the research showing that most people want to fundamentally hold accurate perceptions about the world.

This is particularly important as the public is currently hampered by misinformation and fake news. In two separate studies, we each found that misinformation about climate change has a disproportionate influence on public attitudes and opinion. However, we also found that inoculating people against the false arguments neutralized misinformation's influence, across the political spectrum. In essence, teaching people what false arguments might be deployed helped them overcome their cultural biases. Other work similarly shows that the politicization of science can be counteracted with inoculation.

People are complex, social and affected by a diverse range of influences depending on the situation. We want to hold accurate views, but emotion, group identities and conflicting goals can get in the way. Incorporating these different insights into human thinking enriches our

understanding of how people form opinions and make decisions.

Effective science communication requires an inclusive, holistic approach that integrates different social science perspectives. To simplistically focus on a single perspective paints a limited and increasingly inaccurate view of how humans form judgments about social and scientific issues.

This article was originally published on The Conversation. Read the original article.

Provided by The Conversation

Citation: Facts versus feelings isn't the way to think about communicating science (2017, July 6) retrieved 3 May 2024 from https://phys.org/news/2017-07-facts-isnt-science.html