

World view



By Lee McIntyre

Talking to science deniers and sceptics is not hopeless

Fears of backfire effects are overblown, and advice to listen and interact still stands.

I was at the March for Science in Boston, Massachusetts, on 22 April 2017, as were many scientists. About 70,000 of us descended on the Boston Common, a famous park in the city. We were there to stand up for facts and truth.

Where are the crowds of scientists now? Since then, harms from science denial have only increased: global suffering has grown owing to inaction on climate change, and COVID-19 infections have risen along with the scourge of vaccine scepticism.

I've been out there – I talked to flat-earthers at a convention in Denver, Colorado, and went to rural Pennsylvania to talk to coal miners about climate change – and I've asked my scientist friends to come with me. No dice.

"Those people just aren't worth talking to," they'll say. "I wouldn't make a difference anyway."

That's wrong, both factually and morally. Those people can and do change their minds, although it requires someone to put in the time to overcome distrust.

To be sure, many experts have launched themselves against misinformation, enduring abuse on social media and even threats to their safety. But when scientists turn down my invitations, it's not because of fear. Most often, their excuses are grounded in the 'backfire effect', an irreproducible 2010 finding that people sometimes embrace misconceptions more strongly when faced with corrective information, implying that pushing back against falsehoods is counterproductive. Even the researchers whose results were exaggerated to popularize this idea do not embrace it any more, and argue that the true challenge is learning how best to target corrective information (B. Nyhan *Proc. Natl Acad. Sci. USA* **118**, e1912440117; 2021). (Public-engagement-101 advice to 'build trust and listen' is still paramount.)

Meanwhile, evidence is growing that rebuttals can be effective. Science deniers – whether on vaccines, evolution or climate – all draw on the same flawed reasoning techniques: cherry-picking evidence, relying on conspiracy theories and fake experts, engaging in illogical reasoning and insisting that science must be perfect. A landmark 2019 study (P. Schmid & C. Betsch *Nature Hum. Behav.* **3**, 931–939; 2019) showed that critiquing flawed techniques can mitigate disinformation. (Admittedly, this study did not examine whether this works in person or with hardcore deniers.)

So how does 'technique rebuttal' work in practice? Here's my experience. When I attended the Flat Earth International Conference in 2018, I chose to say nothing on the first day, although it was hard to keep my mouth shut when

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I heard that Antarctica is a wall of ice that keeps the sea from flowing off Earth. By the second day, I was glad I'd waited. I knew if I'd offered evidence, they'd say that space was fake and scientists were liars.

Although I didn't convince any flat-earthers on the spot, I did learn how to get them to listen. I let them speak, then followed up with questions once the dialogue was rolling. Instead of refuting arguments, I asked, "What evidence might change your mind?" If they said they needed 'proof', I asked why existing evidence was insufficient. If they shared a conspiracy theory, I asked why they trusted the evidence for it. By doing that – and not monologuing the facts – I was able to let them wonder why they couldn't answer my questions.

It is an axiom of science communication that you cannot convince a science denier with facts alone; most science deniers don't have a deficit of information, but a deficit of trust. And trust has to be built, with patience, respect, empathy and interpersonal connections. Because I spent the first day listening, even committed deniers were interested in what I had to say.

Arnaud Gagneur, a researcher and physician at the University of Sherbrooke in Canada, and his colleagues conducted more than 1,000 20-minute interviews in which they listened to new parents' concerns about vaccinations and answered their questions. Those parents' children were 9% more likely to receive all the vaccines on the schedule than were those of un interviewed parents whose babies were delivered in the same maternity ward (T. Lemaitre *et al. Hum. Vaccin. Immunother.* **15**, 732–739; 2019). One mother told him: "It's the first time that I've had a discussion like this, and I feel respected, and I trust you."

So what should scientists do? Even non-experts can use technique rebuttal. A geologist can engage a neighbour who is vaccine hesitant. A protein biologist can coach an aunt or uncle who wants 'more evidence' that climate change is real. ('Content rebuttal' can also be effective, but requires expertise.) Instead of shifting to more comfortable conversations, engage in respectful exchange. If you spend more time asking questions than offering explanations, people will be more likely to heed the explanations that you do offer.

Where should you do this? Wherever science deniers can be found. Speak up in line at the pharmacy. Volunteer to speak at your kids' school. Or, if you're ambitious, join me at the upcoming flat-earth convention. I already have a physicist friend coming along.

Those who want to make a difference can learn how to do so. Resources are available through the Alan Alda Center for Communicating Science in Stony Brook, New York, and the University of Cincinnati's Center for Public Engagement with Science in Ohio. It isn't as comfortable as cheering with fellow marchers, but it can be more effective.