

## **Dr. John Cook**

Dr. **John Cook** is a research fellow at the Centre for Behavior Change at the University of Melbourne. His research focuses on the psychology of climate change denial and other forms of misinformation, and how to counter misinformation using critical thinking and inoculation to build public resilience. In 2013, he lead-authored an [award-winning](#) paper analyzing the [scientific consensus on climate change](#) that has been highlighted by [President Obama](#) and [UK Prime Minister David Cameron](#). He has created various publicly accessible resources that provide education and skill-building for countering misinformation, all of which are compiled on his website [Skeptical Science](#).

James Hoggan and Mark Shakespear interviewed Cook about how best to address disinformation. The interview has been edited for length and clarity.

**JH:** How serious is the problem of disinformation?

**JC:** Very serious, and it's multidimensional. It's interesting that you're focusing on attacks. We have [research coming out](#) in which we trained a machine learning model to detect misinformation claims, and then we fed five million tweets from 2022 into it. We found that 40% of climate misinformation on X (formerly Twitter) is attacks on people. So it's not the science arguments, it's not about the greenhouse effect, or whether global warming is happening, or impacts, or even policy. It's attacking scientists and environmentalists 40% of the time, while another 20% is conspiracy theories. So the bulk of climate misinformation is trying to undermine public trust in climate science and institutions. So I think that's crucially important. We see trust eroding over time, and misinformation is making that happen.

**JH:** In your paper, you talked about disinformation across a broad spectrum of topics; it's not just about climate change. What else were you looking at?

**JC:** Well, there are papers published separate to that which found that [when people believe one conspiracy theory they're likely to believe others](#) (for example, climate change denial is [predicted by belief in various conspiracy theories](#)), because once you go down that rabbit hole and you start distrusting institutions and scientific data, then you're more likely to distrust other science. Climate denial over the last few decades has softened the ground for distrust in medical data during the pandemic. So, yes, climate misinformation has this spillover effect into other areas, and it generates general distrust in institutions and science, and that mindset then applies to other areas and other topics. I think democracy and the democratic process would be part of that also.

**JH:** So is it a far right movement, or is it also on the left? Who's behind it?

**JC:** That's a complicated question. Dr. Stephan Lewandowsky published a study finding that [conservatism predicts climate change denial](#). With vaccination it gets a little bit more complicated. You have conservatives who oppose vaccination because they don't want the government to tell them what to do with their children; it's a freedom, liberty thing. But there's also appeals to nature arguments coming from the left, where the most natural course of action — in this case, not vaccinating — is seen as the most appropriate. So for issues like vaccination

it's more complicated. But during the pandemic we did see anti-vaxxers align with other conspiracy theorists, like QAnon, which is far right. So there were alliances between anti-vax groups and other conspiracy groups. And there is the expectation that anti-vax misinformation is only going to get worse in the future. It got an adrenaline shot from the pandemic. I don't think that it's going to be going away.

**JH:** Vancouver emergency physician Dr. David Sweet is working on childhood vaccination hesitancy with people from the United States and Canada. He's focusing on combating vaccine misinformation, just like the David Suzuki Institute is dealing with climate change misinformation. We're seeing similarities across these two areas of misinformation.

**JC:** That's exactly my situation. With climate misinformation, which has been my main focus for 15 years through my psychology research, I've been gradually moving towards inoculating the public, building their resilience, or their critical thinking, by teaching them the techniques used in climate misinformation. Those techniques are used in all science denial topics. About a year and a half ago, UNICEF approached me about taking that approach and applying it to vaccine misinformation. We have a vaccine misinformation game that we've been developing, which is basically the same as the [Cranky Uncle game](#), which we brought out in 2020, focused on climate misinformation. Now we have a [Cranky Uncle vaccine](#) version of the game. There's a lot of overlap. Eight out of 10 techniques in the vaccine version were also in the climate game, we just added a couple of extra rhetorical techniques that are specifically used in vaccine misinformation. That approach of inoculating through explaining the techniques applies across topics, and even conveys resistance across topics. If you learn a technique in one topic, we've found that people can then spot that technique in other topics. It's like a universal vaccine.

**JH:** I watched a video you made with 23 rhetorical techniques used in misinformation. How is the methodology or communications model evolving?

**JC:** So, in [more recent research](#) we've done, we developed ways to detect fallacies automatically. We're working towards automatic debunking of climate misinformation. You need to detect both the fallacy or technique being used as well as what the actual climate myth is and what the content is claiming. In the process of training a machine to detect fallacies/techniques, we built a dataset of about 2,500 examples of climate misinformation and what technique was used, and that gave us a map of which techniques are being used across which misinformation claims. The point of that is we need to better understand what the arguments being used and how they are misleading, because you need to understand that in order to inoculate people, or pre/debunk misinformation.

**JH:** Can you talk about this inoculation approach that you're using, and how other people who don't have your expertise can use it?

**JC:** The technical term for it is technique-based inoculation. It simply explains the magician's trick: the rhetorical techniques used in misinformation. Once you know them, it's hard to unsee. You can spot that technique elsewhere. It's about being aware of the techniques and explaining those to people. This is a communication approach I learned from critical thinking scholars. They recommend that the most powerful way to explain techniques is parallel argumentation, which is

another way of saying using logic analogies, or taking the flawed logic in disinformation and transplanting it into parallel situations. For example, someone arguing that cold weather disproves that global warming exists is the same as arguing that nighttime disproves that the sun exists. Or, I just ate a sandwich, which disproves that global hunger exists. It's using anecdotes or personal stories and then generalizing them to the world. That's a way to explain the logical flaw in the original argument in a way that's relatable and concrete, usually an everyday experience that makes the logic obviously ridiculous. Often it's quite entertaining. I noticed that late night comedians use this technique all the time when they're debunking disinformation. [We've done a lot of research using parallel argumentation](#), testing it as a debunking approach, [often with humour or cartoons](#). We find that using that approach, as opposed to a more standard or serious explanation of logical fallacies, grabs people's attention more; it holds their attention longer, they're more likely to share it and it's more likely to go viral. It has benefits above other ways of trying to debunk misinformation.

**JH:** As I was watching your videos, I was thinking of something that Dr. Ed Maibach said. He was warning me against the way I was framing disinformation, because I was trying to get people to engage in what Daniel Kahneman calls slow thinking, which people generally don't like doing. Do you use humour because people are more likely to engage this way?

**JC:** It's a good question: does humour engage System 1 thinking versus System 2 thinking? Certainly, humour reduces barriers. With climate change, because it's such a scary, intimidating topic for a lot of people, humour makes it accessible. I have been thinking about the challenge of fast thinking versus slow thinking. The vast bulk of what people do is fast thinking: using mental shortcuts and emotional instantaneous reactions. What I do is try to boost people's critical thinking to recognize techniques of misinformation. This is a System 2 slow thinking process. Already I'm going up against the hardwiring of the human brain. One way we got around that was through games. So the Cranky Uncle game teaches people the techniques, explaining the technique of cherry picking, or the technique of fake experts, and goes through the explanations. So we're at the System 2 slow thinking stage, and then what the game does is it gets people practicing critical thinking, showing examples of misinformation and saying, "which technique is this?" It's a multiple choice question. Then they choose their answer, and when they get it right, they gain points, they level up. It uses all those gameplay elements to motivate people to keep playing and keep going further and further into the game. That means that they keep practicing critical thinking.

If you practice a difficult task often enough, then you start to engage a third type of thinking. In Daniel Kahneman's book, *Thinking, Fast and Slow*, he talks about slow thinking, fast thinking, then expert heuristics as the third type of thinking. Expert heuristics is when an expert has performed a difficult task so many times they can do it quickly and easily. Like a heart surgeon who has done the same operation a thousand times, they can assess a really complicated situation quickly and instantly do something. What the critical thinking game does is get people practicing until their ability to spot fallacies — a slow thinking process — becomes a fast process through practice.

**JH:** Who is the audience in your video about the 23 misinformation techniques?

**JC:** With my work, I divide the population into three audiences. There's the convinced, there's the undecided or the disengaged, and then there's the dismissives. The dismissives, who are around 10% or less in the U.S., are not my audience. The convinced or the undecideds are my two audiences, and I have different roles with each. With the convinced, it's about activating or empowering them, and inoculation has that effect on them. They're less likely to be misled by disinformation, but disinformation can cause them to self silence. Most of the people who are convinced or alarmed about climate change don't talk about climate change with their friends and family. And the main reason why, which was explained in [research published by Janet Swim and Nate Geiger](#), is the misconception of pluralistic ignorance, which is being ignorant of the fact that you're in the majority. Disinformation gives them the impression that they're a smaller proportion of the public than they actually are, and if they talk about climate change, then the cranky uncle is going to push back against them and make them look stupid. When people learn the techniques of inoculation, researchers have found an effect called post-inoculation talk. In other words, once people know the techniques, when they encounter their cranky uncle, they're empowered to talk about the issue because they're more confident to respond to that pushback.

**JH:** You think it's a lack of confidence that's silencing the majority of people?

**JC:** Yes. With inoculation, the primary goal is to stop people from being misinformed, but it can also activate and empower people to talk about climate change. With the convinced and alarmed group, that's the goal: with the "[23 ways to mislead](#)" video, the cranky uncle game, and all the other content I create, it's about giving them the tools to be able to talk about climate change with confidence.

My other audience is the disengaged or undecided. And that's where using humour can help engage them and bring them into the topic. Humour makes them more likely to engage with climate content, and it also grabs attention and it's more likely to be shared. For this group, it's about building their resilience against being misled by disinformation and hopefully moving them into the convinced and alarmed group.

**JH:** When I spoke to scientists who have been targets of threats and harassment, and doctors who were looking at COVID-19 across Canada, some said that they go on social media less, and are more cautious about doing media interviews. Are you concerned about that kind of silencing as well?

**JC:** Definitely. Stephan Lewandowsky wrote a paper, "[The Subterranean War on Science](#)," about the phenomenon of attacking scientists doing climate or COVID-19 research. And attacking misinformation researchers is one of the themes in [a paper that Stephan and I recently wrote](#), because we saw that as a new development. It has had a chilling effect. Even before they were attacking misinformation researchers, the attacks on climate scientists had an effect, even if the scientists didn't realize it, because when any group is attacked using stereotypes, that causes the group to behave in a way that avoids that stereotype. If scientists are attacked as being alarmist, they instinctively try to go in the other direction and downplay their scientific results to avoid that stereotype of alarmism, even if their results are alarming. That's been going on for years now.

I've experienced this personally. In 2013, when our paper came out finding a 97% consensus that climate change is caused by humans, my university was attacked. I was attacked through my university, where deniers targeted specific executives at the university, trying to pressure them to either fire me or retract my research. They attacked the journals that I was publishing at and intimidated the editors, which caused one of our papers to be retracted, because the journal was threatened with legal action and they were afraid of being sued. From that, we've learned that we also need to build resilience amongst academic institutions, journals, journal editors, universities and university leadership. They need to understand the techniques of disinformation, which aren't just public attacks but can be this subterranean war, intimidating through private channels in order to silence. Not just self-silencing, but actually censoring scientists when deniers don't like the research.

**JH:** So these kind of silencing techniques are part of disinformation or misinformation campaigns?

**JC:** Yes. And I think it's important to bring attention to these types of attacks on the scientific community. Sunlight is the best disinfectant.

**JH:** What are the main rhetorical techniques used in disinformation that people should pay attention to?

**JC:** We use the acronym FLICC when focused on the main ones: fake experts, logical fallacies, impossible expectations, cherry picking, and conspiracy theories. We wrote a [summary of FLICC](#).

**JH:** Can you define inoculation, prebunking and debunking? What's the thinking behind your focus on inoculation?

**JC:** Debunking occurs after people have been exposed to false or misleading information. Prebunking takes place before exposure, and is alternatively called inoculation, because the principle is to build immunity by exposing people to a weakened version of the disinformation. Between prebunking and debunking, you can weaken misinformation in several different ways: fact-based, technique-based, and source-based. You can say, "here is this argument coming from this organization, which is a far right think tank, and it's funded by a fossil fuel company" — that's source-based. Fact-based would be: "here is an argument casting doubt on the greenhouse effect, but here are the facts of how the greenhouse effect actually works, as a way to show how that argument is wrong." With technique-based it's: "here is the technique that this misinformation uses to pass doubt on the facts, and explains how the technique casts doubt." It's probably the most appropriate technique for prebunking because you're trying to provide general immunity against future encounters with misinformation, and you don't know exactly what form that will take. If it's fact-based or source-based, it's specific, whereas technique-based is general. Therefore, you can generally inoculate people against that technique in a variety of contexts. For example, during the pandemic we knew that there was going to be conspiracy theories, but we didn't know exactly what form they would take, so we concentrated on explaining the traits of conspiratorial thinking and helping people spot those as a red flag of a baseless conspiracy theory.

**JH:** Have you written on the traits of conspiracy theories?

**JC:** Yes. [The Conspiracy Theory Handbook](#) is where Stephan Lewandowsky and I first formalized the seven traits of conspiratorial thinking. CONSPIR is the acronym for the seven traits of conspiracy theories, which stands for: contradictory, overriding suspicion, nefarious intent, something must be wrong, persecuted victim, immune to evidence, and re-interpreting randomness. I brought these seven traits back into the FLICC framework, because the C in FLICC is conspiracy theories. So conspiratorial traits are in the FLICC paper as well, integrated into a cohesive whole.

**MS:** Compared to the facts-based approach, do you think the technique-based, or general, approach would be better at getting around polarization, or backfire effects from debunking? Is this part of your motivation for using this approach?

**JC:** Definitely. The [paper that we published in 2017](#) was the first we did on technique-based inoculation. It showed two things. Firstly, when you show just climate misinformation alone, that has a polarizing effect: conservatives go down in their climate beliefs while liberals don't change much. The more conservative people are, the bigger the effect of misinformation. So climate misinformation pulls the public apart in its views about climate change, and people become more polarized. Then we tried a technique-based inoculation, and found that that polarization disappeared due to the polarizing misinformation being neutralized. Our inoculation focused on the technique, using tobacco misinformation from the mid-20<sup>th</sup> century as the example, and showing climate misinformation that used the same technique. That had the effect of neutralizing the polarizing misinformation, where the misinformation no longer had any effect on conservatives or liberals, it was just a horizontal line. So that told us two things. Firstly, nobody likes being misled regardless of where they sit on the political spectrum. So if you explain the techniques in a general way without triggering people with climate change — or whatever might be the triggering issue — technique-based inoculation allows you to sidestep those triggers. That's one way of neutralizing it. Secondly, we found that by going on a different topic, the technique-based approach generalizes across topics. Just those two benefits - neutralizing the polarizing misinformation and working across topics - opened our eyes to the potential power of this technique-based approach, and that's why my research further examines this approach and continues to find other benefits.

**JH:** Is there anything else you would like to add?

**JC:** I would point you to the other handbooks we've done. [The Debunking Handbook](#), published in 2020, is written by two dozen leading misinformation researchers. It's probably the most relevant one if you thinking of how to address disinformation. We've also written [The Conspiracy Theory Handbook](#) and [The Consensus Handbook](#). Ultimately what we do with these handbooks is summarize the scientific literature for a lay audience, and explain how you put it into practice.