

Title: Cailin O'Connor, How False Beliefs Spread
Episode: 62
Podcast: Half Hour of Heterodoxy

Transcript

Chris Martin: My guest today is Cailin O'Connor. She is a Philosopher of Science at the University of California Irvine. We will be talking about her latest book, *The Misinformation Age: How False Beliefs Spread*, co-authored with James Owen Weatherall.

So the goal of your book is to explain why people believe false stories and you draw on several case studies in the book. One at the beginning about a story that was popular during the medieval era but jumping into a more contemporary story, let's talk about Pizzagate which was a conspiracy theory in 2016 that John Podesta's emails contain coded messages about a child sex ring in a pizza restaurant. How does your model or your theory approximately explain how that sort of news spread through the world?

Cailin O'Connor: Yeah. Well, there were a number of things going on in that particularly weird case. So, one of the most important points that we make in the entire book is that human knowledge is deeply social, that we get most of our beliefs just directly from peers, teachers, and friends who tell us about things. And what this means is that we are susceptible to online information including conspiracy theories like Pizzagate. So you might hear about Pizzagate from someone. You by dint of being a human, tend to trust other people's testimony, at least in some cases, and you believe, "OK, maybe this is true."

And this is connected to the way we learn all sorts of everyday information. So how did you first find out that pizzas were delicious? Well, probably before you ate one someone told you, "Try this. It's delicious." And you believe them and it turned out to be true. We get knowledge like this all the time.

So in some way, it's just a very ordinary kind of occurrence that people come to believe in things like Pizzagate, via knowledge on the internet. Now, in that particular case, there was something else going on that's very common in other conspiracy theories that has to do with social trust. So since we get our beliefs or so many of our beliefs from others, we all developed these little heuristics to help us pick out who do we trust, who are we going to take up beliefs from when they tell us.

And one thing we know is that people tend to be more trusting of those who they identify as like themselves and less trusting of to proceed to outsiders. So in the case of conspiracy theories, this can lead to a situation where you have a community who all share conspiratorial beliefs, maybe online, and who don't trust those outside the group who are saying, "This stuff is nonsense. It's just false."

And in the case like Pizzagate, they can get worse. Political identity was probably also at play. There's a lot of mistrust between liberals and conservatives and that might make a conservative

reader more likely to believe the Pizzagate conspiracy and then resistant to evidence from liberal sources countering those beliefs.

So what we do in the book is we build a bunch of models to try to understand cases like this and other cases. We look at one model of how this sort of social trust influences the ability of a whole community to form beliefs. And one thing we find is that it really hurts the community. The groups who based their trust on factors like who shares my beliefs tend to develop poorer beliefs because you end up with all these people who believe something false like that Hillary Clinton is a sex trafficker. And then they also don't trust the very sources that could help them develop better beliefs.

Chris Martin: You mentioned in the book that the computer models of your building are based on something called *Baldoye* [0:04:04] [Phonetic] Models, after the two people who created them. Tell me a bit about how those models are more advanced than prior models and why they are better for the study of false information spreading?

Cailin O'Connor: Yeah. So part of the strategy we were using which a lot of people aren't familiar with, is to create these really simple models of human society to try to understand society better. And the idea is something like if you are thinking about how beliefs spread, it might be very difficult to find out empirically how some particular beliefs spread maybe to hundreds of thousands of people over the course of five years. We can use these simple models that we can test and understand to try to get some grip on this process.

So the actual model that we use the most in our book is often called a Network Epistemology Model. And what you have are individuals who have a social network. So they have connections between each other that are supposed to represent ties of friendship or communication. They all have beliefs about some factor in the world. So maybe they either think vaccination is safe or it can cause autism. And then they use their beliefs to gather evidence from the world.

So maybe someone who thinks vaccination is safe goes ahead and vaccinate – just vaccinate for children. Then they see what happens. Then they can share this evidence with their neighbors in the network. So they tell other people what happened when they gathered evidence.

And then after seeing that evidence, everyone who sees it can then change their mind. So they might develop new beliefs. So if they saw well, nothing happened to this kid when she was vaccinated, maybe they become more confident that vaccines are in fact safe.

So the core factors of this model is that represents a group of people who are unsure about some matter-of-fact, who can test the world, who can share evidence, and who also use reasonable rules to change their beliefs in light of the evidence that they see.

Chris Martin: So in these models, we are modeling people as someone extroverted, people go out and talk to other people about the information they have. And there's not much contrast between types of people. We do have professions. We will get into that later.

And one thing that interests political scientists is that engagement actually differs quite a bit. People who earn more and people who are more educated tend to be more engaged with political topics. Can your model account for the fact that some people are much more engaged than others and those are also the people who have more money?

Cailin O'Connor: Yes. So the models that we've looked at don't consider something like engagement. It would be possible to do research using them where you said, "What if we supposed that some of the people in our model are more likely to go seek evidence from some quality source?" And some of them are just more likely to listen to what they are told by whoever random person kind of gives them information.

In general, there are just so many things that aren't included in models like this. If you think about all the thing that mattered as human belief formation, there are just dozens of factors that are important. We have all sorts of reasoning biases. There are a lot of different ways that we ground social trust. We have biases towards conformity with other people. All of this matters to the way beliefs spread.

So part of our strategy isn't to capture everything that will matter but rather, to capture some of the core things. And that's actually really important because of course if you make a model really complicated, you can't analyze it properly. You just can't understand how it works.

And in a simple model, you learn what just some few features do. So for example, the social trust model I mentioned, we look at just the model where there is not a lot in there except this aspect that people don't trust those who have different beliefs from them. And then we show well, OK, just that aspect alone can be enough to make the whole community worse at learning and then to cause polarization. So we kind of isolate factor by factor and try to see just what does this thing do, if that makes sense.

Chris Martin: So is it fair to say you're more interested in the roles that people have so some people within the network have a role of scientist of a policy maker or propagandist?

Cailin O'Connor: Well, I mean we look at some models where we indeed introduced those roles. Something like engagement, it's not that we are saying it's not important. Just that we have to cut out a bunch of things in order to study some of the core things that do matter to belief.

Chris Martin: And one important concept in the book is *Merchants of Doubt*. In several places, you cite the book, *Merchants of Doubt* by Erik Conway and Naomi Oreskes. I've actually tried to get them on this podcast several times but they are in high demand to say the least. How strongly influenced were you by *Merchants of Doubt*?

Cailin O'Connor: We were pretty strongly influenced by their work. It's a fantastic book and they did so much work just to pull out all of these historical details about how industry actors have been influencing popular belief on science for the last 70 years at least.

It was in particular, really helpful to myself and my co-author Jim Weatherall in thinking about industrial propaganda and the techniques industry uses to shape public beliefs about science because in *Merchants of Doubt*, they got all of this information, private data from big tobacco companies that could really elucidate what were the strategies they were using to shape belief.

And in particular, we ended up with this view where industry propaganda can be much more subtle and tricky than we typically think and I don't think we ever could have come to that view if not for all the work that Oreskes and Conway did in their book.

Chris Martin: Yeah. This coming semester in planning to assign the film, the *Merchants of Doubt* film, to my class because I think it covers those issues really well. Do you ever use the film or book in your classes?

Cailin O'Connor: I've never taught the book. And actually, I haven't seen the film. I hear it's really great though.

Chris Martin: It is really good. I mean it's not just the book. There are some cinematic techniques that work really well and they use those especially at the beginning where the magician. I mean I don't know if there's a parallel in the book.

Anyway, you talk about three processes that are problematic. The processes are biased production, industrial selection, and selective sharing. So tell me a bit about these processes and examples of each of them.

Cailin O'Connor: So these are three methods that we identify in the book that industry uses to control public belief about science. So biased production is probably closest to what I think people tend to have as a naïve view of how industry influence works. So we have this idea that industry just gives money to a scientist and then that scientist starts to produce fraudulent research on behalf of the industry.

Chris Martin: So they came up with something like the tobacco industry here.

Cailin O'Connor: Right. Tobacco industry or maybe big farmer or maybe the sugar industry, some kind of industry where there's scientific information that would prevent them from maybe selling their product or oil and gas. They don't want people to know about climate change.

So in the case of biased production, what industry can sometimes do is control the publications or outputs from a lab. So they have some scientist who is maybe in-house and who they are funding and if a finding goes against something they want to show. So say, they are funding a study on the link between tobacco and cancer, big tobacco is funding this.

If a study finds such a link then they can tank that study. They can just physically put those results away and never publish them or share them with the public. So they can hide data that were showing some detrimental link between their product and public health. Now, that's pretty obviously not something people ought to be doing.

The other two methods are a bit trickier because it's less clear that industry is really breaking the rules in some way when they use these methods.

So selective sharing is really fascinating because what people in the industry can do is keep advantage of the fact that scientific evidence tends to be probabilistic. So not every smoker gets cancer and not everyone who gets cancer smokes. And I think there are going to be some studies that find just no link between tobacco-smoking and cancer even though such a link exists.

And then what big tobacco could do is take these studies, totally independent research done by researchers who they are not connected to and then share these studies widely, which is what Oreskes and Conway document that tobacco industry actually did in the '50s. So they would send out pamphlets saying something like five studies find no link between cigarette smoke and cancer, and they would send it to journalists, to policy-makers and members of the public. So that was real data and they didn't do anything to the scientific community. All they did was share real data but they still managed to mislead.

Industrial selection is different because what this involved is industry [0:13:45] [Indiscernible] to actually shape what gets produced in the scientific community in the first place. Again, without any kind of fraud or breaking the norms of science. So what they often do is find scientists who already support what industry is trying to show and then fund only those scientists.

So for instance in the '60s, big sugar funded researchers who already believed that fat caused heart disease and then they didn't fund the guy who thought that sugar caused heart disease obviously. So the guys they were funding, it's not clear that their research was changed in any way by receiving this funding. They just had more money to do their research and to publish papers.

And the result can be that industry controls what data gets produced, what is out there in the first place just by donating out money and then allowing scientists to keep doing what they were doing before and then if people accuse these scientists of industry bias, they can truthfully say, "No, I did exactly what I would have done." So they will defend themselves and the industry and in some ways, correctly so. They weren't being bought off. But nonetheless, you can get these outcomes where industry is shaping the scientific story.

Chris Martin: And selective sharing does seem to be a general science problem. My background is in psychology and sociology. In psychology, we have something called the file drawer effect. Not solely in psychology, but it's the issue where you try to do a study to show something and the study doesn't product the results you want so file it away and then you do it again and just based on the odds, you eventually get a study where you find the results you are looking for. And the reason you found it, that's probably random chance but that's the one you publish.

Is there any way that selective sharing differs substantially from the file drawer effect?

Cailin O'Connor: I mean I would say that that's actually very, very similar to bias production where basically what happens is that people do real studies, get real results but just control the output in a way that allows them to control what data is reaching other people. So there's a big similarity between a scientist who say has some favored theory that they are trying to show and the suppressing data going against it. And an industry propaganda, someone in big tobacco who is suppressing the output of a scientific lab to control what people think about us.

Now, I think that both of those should also be distinguished from what people sometimes called a file drawer effect, which is what happens when journals just don't publish no results. So they just don't publish papers where people don't find anything. And so scientists end up with a big stock of studies that they've done in their file drawer where there was no effect. So maybe they try to test, did some chemical cause harm? Did it cause cancer? And they find, no, it didn't but they can't publish that because it doesn't show anything positive and new so they file it away.

But then someone happens to have a study that seriously show how this chemical does cause cancer and then they publish it. Well now, their publication is the only thing out there and nobody knows about this other evidence. So that's different.

That again means that the public or other scientists aren't seeing the full body of evidence in a way that can mislead them but it isn't the same as someone trying to convince others of some fact by curating evidence in a kind of sneaky way like you see in biased production or the example you gave.

Chris Martin: Are there any changes in the fields of social science and science in the last, I don't know, 10 or 20 years to try to combat these problems?

Cailin O'Connor: There have been so many proposed changes aimed at combatting issues related to things like the file drawer effect. So for example, there have been proposals that we make preregister studies that everyone who is going to do a study has to first register it and say, "Here's what I'm going to study. Here's my hypothesis. Here's how much data I'm going to gather." Then gather the data then they can only publish things that they had already said they were going to do and in addition, they can't file drawer anything. The data has to get out there if you have preregistration. So that can help with some of these effects.

When it comes to preventing industry influence and science, there are some things people have tried to do but it's more often in the areas where it's very clear that industry has a very heavy hand in the shape of science and not everyone is trying to take various steps to protect the scientific community from industry.

So Philosophy of Science, Bennett Holman, wrote his dissertation on the interaction between big pharma and various people trying to regulate the way science and pharmaceuticals was done to protect the public. So what he showed is that there was this continuing series of interactions where big pharma would be shaping the way certain studies were coming out, using techniques to try to show that their drugs were safe and effective and get them on the market. Then

regulators would work to stop those effects. And then big pharma would take another tack. Find another way to try to influence the data.

That's the case where there were policies that could be temporarily effective but his point was if you have another actor who has some goal like to control public belief, policies that you implement would not work forever. It's a kind of arms raised. That actor is then going to shift strategies to try to get around what you put in place to stop them.

Chris Martin: Yeah. That's definitely happening in social psychology where people are pushing preregistration and you get a badge. What has happened now is people publish an article and they say in the article that they preregistered the study but then if you actually take the time to look at the preregistration, you find that there were substantial changes that they made between the registration and the actual study. And I guess somewhere in the peer review process, someone is not reading the preregistration thoroughly. And maybe at some point in the next couple of years, we will find a policy to fix that. As you say, I think there might be an arm raised going on.

Cailin O'Connor: Yeah. My student, *Adrian Rossini* [0:20:16] [Phonetic] is actually writing his dissertation on some of these issues. And what he has pointed out is that in a lot of cases when we are trying to implement things to improve these scientific outcomes like preregistration but there are also things like sample splitting. You do a test on half of a sample of data and then retest it on the second sample just to make sure that you are basically really getting the result that you said.

What he has pointed out is that in thinking about these regulations or rules that they might put in place, we shouldn't ignore the fact that scientists have goals and we are in a game-theoretic situation. Scientists want to publish and they often want to forward certain theories because often, they think they are right. And in particular, they want to publish.

And so, if you force people to preregister, they might also respond like for example – or if you say, “Look, preregistration is going to improve the trust in your study.” They might respond by – if they really think their study is going to pan out preregistering but then not in cases where they think it might not be as good of a theory. They might adjust in ways that make the regulation flaws-effective.

Chris Martin: I mean speaking for myself, I've preregistered a couple of studies. And part of the preregistration was that I share the data on open science framework and I do plan to do that but there's also the fact that you are doing several things at the same time so sometimes there can be a 2-year lag between saying you're going to share the data and actually sharing the data.

So you talk about uncertainty in your book and how one tactic that people who want to cast down on the issue of climate change uses that they say there's uncertainty in the science and some studies show there is climate change. Some studies show there is not. And these are cases where people are explicitly saying there's uncertainty.

But I read about this especially in the context of the Russian propaganda industry where the propagandist try to just induce fatigue by not saying that there's uncertainty but rather just pushing out several contradictory messages. At the same time through rumors as with social media accounts that are fake so they're not all clearly coming from the propagandist in the public's eye. And then you just get fatigued because of all these rumors.

So in the case of the passenger jet that was shut down over Ukraine, I believe the Russian propagandist industry just spread four different rumors about what caused that and sorting through those rumors just became too tiresome and people stop paying attention to it, which was what the Russian government wanted.

And I know you don't cover that in this book but do you know of any research or are you doing any research into this tactic?

Cailin O'Connor: I'm not researching it myself. But I do think that this is a really important point that we don't cover in the book that later I became much more aware. So in our models in the book, we have these agents who trying to develop their beliefs and no matter how much evidence they got, they keep going. They keep updating their beliefs based on the evidence and trying to develop beliefs.

But as you are pointing out, real people often don't do that. If they get a bunch of contradictory information, they tend to throw their hands up and say, "Well, who knows? I've never going to figure this out. I should just give up," sort of situation.

As you point out, that's part of Russia's propaganda efforts. I think that's really interesting just in general because almost like it was hard to understand industrial propaganda efforts because they are more complicated and subtle than we would have thought. Russian propaganda efforts seem to be the same way. I think in 2016, it became clear what was happening. Everyone thought, well, Russia had a goal. It was to elect Donald Trump. Their propaganda was directed at that.

And as we look at the actual examples of propaganda, we discovered they are much weirder and their goals are much fuzzier so the goals are something like throw a wrench and the gears. Confuse people. Get them to stop trying to figure out what's true. Polarize people. Make them just angry at each other.

In general, it's just more aimed at dysfunction, ruining our ability to keep functioning as a democracy rather than getting some particular political outcome to occur.

So at the individual level, what do you think people can do especially if they are on social media a lot and they use Twitter and Facebook, what can people do to avoid misinformation?

Cailin O'Connor: Yeah. There is so much that we can do on an individual level. In the book, we argue quite a lot for institutional changes. But for individuals, one of the most important things that I think is good to do is to trust a source of information rather than the person who

shared it. So there's research showing that people in deciding are they going to trust something they see on social media, look at who trusted it – sorry, who shared it. Is this person someone I trust in general? Rather than looking who produced this piece of information.

So we should trust information for produced by the New York Times, The Washington Post, by the Wall Street Journal. Look to those sources rather than saying, “My friend, Jill, is really trustworthy and she shared it. So thus, I should just believe it to be true.

There are certain things that we've pointed out really important when thinking about articles or online information about science. So you should trust articles that draw on a lot of papers and sources rather than just one because as we've been discussing, any single scientific study can be wrong or misleading. But the whole body of the evidence is much more likely to steer you in the right direction.

So you may have seen on social media, this goes around every two weeks or something, these viral articles that say something like, “Wine is better for you than one hour of exercising a day.” And it will be based on one study of a group of nonagenarians who among them, wine better predictive longevity than exercise. But that's just one study. If you look at the whole body of evidence like no, wine is not better than exercise for your longevity.

Chris Martin: Yeah. I know a lot of scientists who are really frustrated with how science gets covered in the media because of that specific problem.

Cailin O'Connor: Yeah. Journalists can almost be accidental propagandists in some ways. They are not covering science in responsible ways like this. Not looking at the whole body of evidence and also tending to over report really novel and surprising findings, which I think ties back to what people can do to avoid misinformation. If you see something really surprising, don't believe it right away because surprising things tend to get shared way more on social media because they are novel. People are interested. That's weird. How could that be true?

So they spread faster but are less likely to be right because they don't fit with our information that we already have, our body of evidence about the world. So don't trust that stuff.

One thing I think is really important to recognize that people don't tend to be very aware of is that true facts can be misinformation. So like in the case of selective sharing, when big tobacco was sharing these real studies but nonetheless misinforming people because those studies happen to have various findings.

You see all these cases of memes online now that would just state true facts and nonetheless mislead you. So they might say something like, “Most of the voter registration data in California is taken from driver's license data.” And then that's a fact. And then the next fact would be X many people in California are undocumented but have driver's licenses. And so the implication is that there's a lot of voter fraud in California. Both facts could be true but that doesn't necessarily mean there's voter fraud. So two things can be misinformation and that really confuses people.

Chris Martin: And at the institutional level, what do you think colleges and universities can do?

Cailin O'Connor: Well, there are a lot of different institutions that I think ought to be involved in fighting online misinformation and these include our government and also all the social media platforms. This should be the job of every one who has a platform, to try to be reducing misinformation on there.

Colleges and universities, I think the best they can do is through education because that's what they do. They educate students by designing courses, offering courses, to design in information literacy. And in particular, and if there's something that's often missing from our education about information literacy and it's the social aspect of knowledge.

And as a philosopher, I kind of blame philosophers for this because going back to Descartes, there is this idea that if we want to understand knowledge, we have to understand the individual reasoner, how one person looks around in the world, has all these perceptions of things, reasons about it in this very good way and then comes to true beliefs. And that's what people have studied for hundreds of years when they think about knowledge.

More recently, it has become clear that's just not how human knowledge works. Instead, it is this social beast. And so I think colleges ought to be teaching students about that and helping them use that understanding to then cast a little light on their own knowledge-making processes. In what ways am I vulnerable to all these social texts and biases? In what ways am I trusting things online that I shouldn't trust because they were shared by a friend or looked like they were from a source who I like and thus I want to be friends with and thus I want to trust? So we should be educating students about these kinds of social knowledge factors.

Chris Martin: Thanks for joining us on the show. It has been great having you.

Cailin O'Connor: Yeah. It has been a pleasure. Thank you.

Chris Martin: My next guest is Joanna Schug. She is from the College of William and Mary's Department of Psychology. She is a former professor of mine and we will be talking about how to get people from different cultures to understand one another better.

And as always, if you enjoyed the show, please leave us a 5-star review on iTunes. You can also contact me at Podcast@HeterodoxAcademy.org or on Twitter [@ChrisMartin76](https://twitter.com/ChrisMartin76). Thanks for listening.

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