

THE DEATH OF EXPERTISE

The Campaign against Established Knowledge
and Why It Matters

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How Conversation Became Exhausting

A few centuries earlier . . . humans still knew pretty well when a thing was proved and when it was not; and if it was proved they really believed it.

C. S. Lewis, *The Screwtape Letters*

Yeah, well, you know, that's just, like, your opinion, man.

"The Dude," *The Big Lebowski*

I'D LIKE AN ARGUMENT, PLEASE

Conversation in the twenty-first century is sometimes exhausting and often maddening, not only between experts and laypeople, but among everyone else, too. If in a previous era too much deference was paid to experts, today there is little deference paid to anyone at all. Even among laypeople in their daily interactions, disagreement and debate have devolved into grueling exchanges of contradiction, random factoids, and shaky sources few of the participants themselves understand. Years of better education, increased access to data, the explosion of social media, and lowered barriers to entry into the public arena were supposed to improve our abilities to deliberate and decide. Instead, these advances seem to have made all of this worse rather than better.

Public debate over almost everything devolves into trench warfare, in which the most important goal is to establish that the other person is wrong. Sensible differences of opinion deteriorate into a bad high school debate in which the objective is to win and facts are deployed like checkers on a board—none of this rises to the level of chess—mostly to knock out other facts. Like the customer in Monty Python's legendary "Argument Clinic" sketch, we find ourselves merely gainsaying whatever the other person said last. ("This isn't an argument," the angry customer tells the professional arguer. "Yes, it is," he responds. "No, it isn't! It's just contradiction!" "No, it isn't." "Yes, it is!")

Here, we need to start with the obvious and universal problem: you and me. Or more accurately, the way you and I think. From biology to social psychology, we fight an uphill battle in trying to understand each other.

We all have an inherent and natural tendency to search for evidence that already meshes with our beliefs. Our brains are actually wired to work this way, which is why we argue even when we shouldn't. And if we feel socially or personally threatened, we will argue until we're blue in the face. (Perhaps in the Internet age, the expression on social media should be "until our fingers are numb.") Experts are no exception here; like everyone else, we want to believe what we want to believe.

In our personal lives, we tend to be a bit more forgiving, because we are social animals who want acceptance and affection from those closest to us. In our intimate social circles, most of us think we're competent and trustworthy, and we want others to see us that way, too. We all want to be taken seriously and to be respected. In practice, this means we don't want anyone to think we're dumb, and so we pretend to be smarter than we are. Over time, we even come to believe it.

Of course, there's also the basic problem that some people just aren't very bright. And as we'll see, the people who are the most

certain about being right tend to be the people with the least reason to have such self-confidence. But it is too facile simply to dismiss the exasperating nature of modern discussion as only a function of the stupidity of others. (That's not to say it isn't sometimes true.) Most people simply are not that intellectually limited, at least not if measured by basic indicators such as rates of literacy or completion of high school.

The fact of the matter is that the pitfalls of discussion and debate aren't limited to mistakes made by the least intelligent among us. We all fall prey to a series of problems, including the way we all try to resolve problems and questions in ways that make us feel better about ourselves and our friends. The many influences on the death of expertise, including higher education, the media, and the Internet, are all enablers of these basic human traits. All of these challenges to better communication between experts and citizens can be overcome with education, rigor, and honesty, but only if we know how they're plaguing us in the first place.

MAYBE WE'RE ALL JUST DUMB

Let's confront the most painful possibility first. Perhaps experts and laypeople have problems talking with each other because the ordinary citizen is just unintelligent. Maybe the intellectual gulf between the educated elites and the masses is now so large that they simply cannot talk to each other except to exchange expressions of mutual contempt. Maybe conversations and arguments fail because one—or both—of the parties is just stupid.

These are fighting words. No one likes to be called stupid: it's a judgmental, harsh word that implies not only a lack of intelligence, but a willful ignorance almost to the point of moral failure. (I have used it, more than I should. So have you, most likely.) You can call

people with whom you disagree misinformed, mistaken, incorrect, or almost anything else. But don't call them stupid.

Fortunately, the use of "stupid" is not only rude, it's mostly inaccurate. By any measure Americans are smarter, or at least no less intelligent, than they were several decades ago. Nor was the early twentieth century a Periclean Age of culture and learning. In 1943, incoming college freshmen—only 6 percent of whom could list the original thirteen colonies—named Abraham Lincoln as the first president and the one who "emaciated [*sic*] the slaves." The *New York Times* saw those results and took a moment from reporting on World War II to lament the nation's "appallingly ignorant" youth.¹

Whether people in the twenty-first century can keep up with the gap between their education and the speed of change in the world is another matter entirely. Grade school students in 1910 and 2010 both had to learn how to calculate the sides of a triangle, but today's students must use that knowledge to comprehend the existence of a permanent international space station, whereas their great-grandparents likely had never seen a car, much less an airplane. And nothing can prevent willful detachment, in any era. No amount of education can teach someone the name of their member of Congress if they don't care in the first place.

With that said, there's still the problem of at least some people thinking they're bright when in fact they're not very bright at all. We've all been trapped at a party or a dinner when the least-informed person in the room holds court, never doubting his or her own intelligence and confidently lecturing the rest of us with a cascade of mistakes and misinformation. It's not your imagination: people spooling off on subjects about which they know very little and with completely unfounded confidence really happens, and science has finally figured it out.

This phenomenon is called "the Dunning-Kruger Effect," named for David Dunning and Justin Kruger, the research psychologists at Cornell University who identified it in a landmark 1999 study. The

Dunning-Kruger Effect, in sum, means that the dumber you are, the more confident you are that you're not actually dumb. Dunning and Kruger more gently label such people as "unskilled" or "incompetent." But that doesn't change their central finding: "Not only do they reach erroneous conclusions and make unfortunate choices, but their incompetence robs them of the ability to realize it."²

In fairness to the "unskilled," we all tend to overestimate ourselves. Ask people where they think they rate on any number of talents, and you will encounter the "above average effect," in which everyone thinks they're . . . well, above average. This, as Dunning and Kruger dryly note, is "a result that defies the logic of descriptive statistics." It is nonetheless so recognizable a human failing that the humorist Garrison Keillor famously created an entire town dedicated to this principle, the mythical Lake Wobegone, where "all the children are above average" in his radio show *A Prairie Home Companion*.

As Dunning later explained, we all overestimate ourselves, but the less competent do it more than the rest of us.

A whole battery of studies conducted by myself and others have confirmed that people who don't know much about a given set of cognitive, technical, or social skills tend to grossly overestimate their prowess and performance, whether it's grammar, emotional intelligence, logical reasoning, firearm care and safety, debating, or financial knowledge. College students who hand in exams that will earn them Ds and Fs tend to think their efforts will be worthy of far higher grades; low-performing chess players, bridge players, and medical students, and elderly people applying for a renewed driver's license, similarly overestimate their competence by a long shot.³

Students who study for a test, older people trying to maintain their independence, and medical students looking forward to their careers

would rather be optimistic than underestimate themselves. Other than in fields like athletic competition, where incompetence is manifest and undeniable, it's normal for people to avoid saying they're bad at something.

As it turns out, however, the more specific reason that unskilled or incompetent people overestimate their abilities far more than others is because they lack a key skill called "metacognition." This is the ability to know when you're not good at something by stepping back, looking at what you're doing, and then realizing that you're doing it wrong. Good singers know when they've hit a sour note; good directors know when a scene in a play isn't working; good marketers know when an ad campaign is going to be a flop. Their less competent counterparts, by comparison, have no such ability. They think they're doing a great job.

Pair such people with experts, and, predictably enough, misery results. The lack of metacognition sets up a vicious loop, in which people who don't know much about a subject do not know when they're in over their head talking with an expert on that subject. An argument ensues, but people who have no idea how to make a logical argument cannot realize when they're failing to make a logical argument. In short order, the expert is frustrated and the layperson is insulted. Everyone walks away angry.

Even more exasperating is that there is no way to educate or inform people who, when in doubt, will make stuff up. Dunning described the research done at Cornell as something like "a less flamboyant version of Jimmy Kimmel's bit," and it proved the comedian's point that when people have no idea what they're talking about, it does not deter them from talking anyway.

In our work, we ask survey respondents if they are familiar with certain technical concepts from physics, biology, politics, and geography. A fair number claim familiarity with genuine terms

like *centripetal force* and *photon*. But interestingly, they also claim some familiarity with concepts that are entirely made up, such as the *plates of parallax*, *ultra-lipid*, and *cholarine*. In one study, roughly 90 percent claimed some knowledge of at least one of the nine fictitious concepts we asked them about.

Even worse, “the more well-versed respondents considered themselves in a general topic, the more familiarity they claimed with the meaningless terms associated with it in the survey.” This makes it tough to argue with these “incompetent individuals,” because when compared with the experts, “they were less able to spot competence when they saw it.”

In other words, the least-competent people were the least likely to know they were wrong or to know that others were right, the most likely to try to fake it, and the least able to learn anything.

Dunning and Kruger have several explanations for this problem. In general, people don’t like to hurt each other’s feelings, and in some workplaces, people and even supervisors might be reluctant to correct incompetent friends or colleagues. Some activities, like writing or speaking, do not have any evident means of producing immediate feedback. You can only miss so many swings in baseball before you have to admit you might not be a good hitter, but you can mangle grammar and syntax every day without ever realizing how poorly you speak.

The problem of the “least competent” is an immediate challenge to discussions between experts and laypeople, but there’s not much we can do about a fundamental characteristic of human nature. Not everyone, however, is incompetent, and almost no one is incompetent at everything. What kinds of errors do more intelligent or agile-minded people make in trying to comprehend complicated issues? Not surprisingly, ordinary citizens encounter pitfalls and biases that befall experts as well.

CONFIRMATION BIAS: BECAUSE YOU KNEW THIS ALREADY

“Confirmation bias” is the most common—and easily the most irritating—obstacle to productive conversation, and not just between experts and laypeople. The term refers to the tendency to look for information that only confirms what we believe, to accept facts that only strengthen our preferred explanations, and to dismiss data that challenge what we already accept as truth. We all do it, and you can be certain that you and I and everyone who’s ever had an argument with anyone about anything has infuriated someone else with it.

For example, if we think left-handed people are evil (it’s where the word *sinister* comes from, after all), every left-handed murderer proves our point. We’ll see them everywhere in the news, since those are the stories we will choose to remember. No amount of data on how many more right-handed killers are on Death Row will sway us. Every lefty is proof; every righty is an exception. Likewise, if we’ve heard Boston drivers are rude, the next time we’re visiting Beantown we’ll remember the ones who honked at us or cut us off. We will promptly ignore or forget the ones who let us into traffic or waved a thank you. (For the record, in 2014 the roadside assistance company AutoVantage rated Houston the worst city for rude drivers. Boston was fifth.)

In the 1988 film *Rain Man*, the autistic character Ray is a perfect, if extreme, example of confirmation bias. Ray is a savant whose mind is like a computer: it can do complex calculations at great speed, and it contains a giant repository of unrelated facts. But Ray, due to his condition, cannot arrange those facts into a coherent context. Whatever Ray’s mind remembers is more important than all the other facts in the world.

Thus, when Ray and his brother have to fly from Ohio to California, Ray panics. Every US airline has, at some point, suffered a

terrible disaster and Ray can remember the dates and body counts of *every single one*. Focused on these terrifying exceptions, Ray refuses to get on any of the available flights. When the exasperated brother asks which company Ray will trust, he quietly names Australia's national airline. "Qantas," he says. "Qantas never crashed." Of course, Qantas does not fly domestically within the United States, and so Ray and his brother set off to drive cross-country, which is vastly more dangerous than flying. But because Ray has no databank of awe-inducing car crashes in his head, he gladly gets in the car.

We're all a little bit like Ray. We focus on the data that confirm our fears or fuel our hopes. We remember things that make an impression on us and ignore less dramatic realities. And when we argue with each other, or when we consult the advice of an expert, most of us have a hard time letting go of those memories, no matter how irrational it may be to focus on them.

To some extent, this is a problem not of general intelligence but of education. People simply do not understand numbers, risk, or probability, and few things can make discussion between experts and laypeople more frustrating than this "innumeracy," as the mathematician John Allen Paulos memorably called it. For people who believe flying is dangerous, there will never be enough safe landings to outweigh the fear of the one crash. "Confronted with these large numbers and with the correspondingly small probabilities associated with them," Paulos wrote in 2001, "the innumerate will inevitably respond with the non sequitur, 'Yes, but what if you're that one,' and then nod knowingly, as if they've demolished your argument with their penetrating insight."⁴

Human beings can get quite creative with the "but what if I'm the one unlucky case" argument. Back in the early 1970s, I visited an uncle who lived in rural Greece. He was a tough, athletic man, but he had a terrible fear of flying, which was preventing him from going to London to seek medical treatment for a serious ailment. My father

tried to assure him with the fatalistic suggestion that while everyone has a time they have to leave the earth one way or another, it's likely not his time to go. My uncle, like so many people who fear flying, resorted to a common objection: "Yes, but what if it's the *pilot's* time to go?"

None of us is perfectly rational, and most of us fear situations in which we are not in control. My uncle was an uneducated man born in a village in Greece at the turn of the nineteenth century. I am an educated man of the twenty-first century with a good grasp of statistics and history—and yet I'm not much better about flying on those nights I've been buckled into the seat of a jetliner during some bumpy approaches into Providence. At moments like that, I try to think about the thousands of aircraft on approach all over the world, and the incredibly small chance that my plane will hit the Disaster Lottery. Usually, I fail miserably: all the flights that may be safely landing from Vancouver to Johannesburg are completely irrelevant to me as I grip the arms of my seat while my aircraft skims the house-tops of Rhode Island.

The late science fiction writer and medical doctor Michael Crichton used an example from the early days of the AIDS epidemic in the early 1980s to show how people are so often convinced that they will always draw the shortest straw. The disease was poorly understood at the time, and a friend called Crichton for reassurance. Instead, she ended up nettled at the doctor's insistence on logic:

I try to explain about risk. Because I have recently noticed how few people really understand the risks they face. I watch people keep guns in their houses, drive without seatbelts, eat artery-clogging French food, and smoke cigarettes, yet they never worry about these things. Instead they worry about AIDS. It's kind of crazy.

"Ellen. Do you worry about dying in a car crash?"

"No, never."

"Worry about getting murdered?"

"No."

"Well, you're much more likely to die in a car accident, or be murdered by a stranger, than to get AIDS."

"Thanks a lot," Ellen says. She sounds annoyed. "I'm so glad I called you. You're really reassuring, Michael."

A decade later, AIDS was better understood and the hysteria faded. In later years, however, new health risks like Ebola, SARS, and other rare afflictions have caused similar irrational reactions, all of them a concern to innumerate Americans who worry more about an exotic disease than about talking on their mobile phones while driving home after having a few drinks at the local pub.

Notice, too, how this bias almost never works in the other direction. Few of us are certain of being the exception in a *good* way. We'll buy a lottery ticket, fantasize about it for a moment, and then put it in our pocket and forget about it. No one heads to a car dealership or a realtor with tomorrow's Powerball number.

We are gripped by irrational fear rather than irrational optimism because confirmation bias is, in a way, a kind of survival mechanism. Good things come and go, but dying is forever. Your brain doesn't much care about all those other people who survived a plane ride or a one-night stand: they're not you. Your intellect, operating on limited or erroneous information, is doing its job, trying to minimize any risk to your life, no matter how small. When we fight confirmation bias, we're trying to correct for a basic function—a feature, not a bug—of the human mind.

Whether the question is mortal peril or one of life's daily dilemmas, confirmation bias comes into play because people must rely on what they already know. They cannot approach every problem as though their minds are clean slates. This is not the way memory

works, and more to the point, it would hardly be an effective strategy to begin every morning trying to figure everything out from scratch.

Scientists and researchers tussle with confirmation bias all the time as a professional hazard. They, too, have to make assumptions in order to set up experiments or explain puzzles, which in turn means they're already bringing some baggage to their projects. They have to make guesses and use intuition, just like the rest of us, since it would waste a lot of time for every research program to begin from the assumption that no one knows anything and nothing ever happened before today.⁶ "Doing before knowing" is a common problem in setting up any kind of careful investigation: after all, how do we know what we're looking for if we haven't found it yet?

Researchers learn to recognize this dilemma early in their training, and they don't always succeed in defeating it. Confirmation bias can lead even the most experienced experts astray. Doctors, for example, will sometimes get attached to a diagnosis and then look for evidence of the symptoms they suspect already exist in a patient while ignoring markers of another disease or injury. (Television's fictional diagnostician Dr. House would tell his medical students, "It's *never* lupus," which, of course, led to an episode where the most arrogant doctor in the world had to contend with his failure to spot the one case in which it was, in fact, lupus.) Even though every researcher is told that "a negative result is still a result," no one really wants to discover that their initial assumptions went up in smoke.

This is how, for example, a 2014 study of public attitudes about gay marriage went terribly wrong. A graduate student claimed he'd found statistically unassailable proof that if opponents of gay marriage talked about the issue with someone who was actually gay, they were likelier to change their minds. His findings were endorsed by a senior faculty member at Columbia University who had signed on as a coauthor of the study. It was a remarkable finding that basically

amounted to proof that reasonable people can actually be talked out of homophobia.

The only problem was that the ambitious young researcher had falsified the data. The discussions he claimed he was analyzing never took place. When others outside the study reviewed it and raised alarms, the Columbia professor pulled the article. The student, who was about to start work on a bright future as a faculty member at Princeton, found himself out of a job.

Why didn't the faculty and reviewers who should have been keeping tabs on the student find the fraud right at the start? Because of confirmation bias. As the journalist Maria Konnikova later reported in the *New Yorker*, the student's supervisor admitted that he wanted to believe in its findings. He and other scholars *wanted* the results to be true, and so they were less likely to question the methods that produced their preferred answer. "In short, confirmation bias—which is especially powerful when we think about social issues—may have made the study's shakiness easier to overlook," Konnikova wrote in a review of the whole business.⁸ Indeed, it was "enthusiasm about the study that led to its exposure," because other scholars, hoping to build on the results, found the fraud only when they delved into the details of research they thought had already reached the conclusion they preferred.

This is why scientists, when possible, run experiments over and over and then submit their results to other people in a process called "peer review." This process—when it works—calls upon an expert's colleagues (his or her peers) to act as well-intentioned but rigorous devil's advocates. This usually takes place in a "double-blind" process, meaning that the researcher and the referees are not identified to each other, the better to prevent personal or institutional biases from influencing the review.

This is an invaluable process. Even the most honest and self-aware scholar or researcher needs a reality check from someone less personally invested in the outcome of a project. (The proposal for the book

you're reading right now was peer-reviewed: that doesn't mean that the scholars who read it agreed with it, but that they were asked to consider the arguments and present whatever objections or advice they might have.) The ability to serve as a referee is often the role of a senior expert, since the ability to find and to recognize evidence that challenges or even disconfirms a hypothesis is something that takes quite a while to learn. Scholars and researchers spend a good part of their careers trying to master it as one of their core skills.

These reviews and revisions are invisible to laypeople because they all take place before the final product is released. The public only becomes aware of these processes when they go wrong—and when peer review goes wrong, it can go horribly wrong. The whole enterprise, instead of producing expert assurances of quality, can turn into fakery, backscratching, score settling, favoritism, and all the other petty behavior to which human beings are prone. In the case of the gay-marriage study, the fraud was discovered and the system worked, albeit not in time to stop the article's initial publication.

In modern life outside of the academy, however, arguments and debates have no external review. Facts come and go as people find convenient at the moment. Thus, confirmation bias makes attempts at reasoned argument exhausting because it produces arguments and theories that are *nonfalsifiable*. It is the nature of confirmation bias itself to dismiss all contradictory evidence as irrelevant, and so *my* evidence is always the rule, *your* evidence is always a mistake or an exception. It's impossible to argue with this kind of explanation, because by definition it's never wrong.

An additional problem here is that most laypeople have never been taught, or they have forgotten, the basics of the "scientific method." This is the set of steps that lead from a general question to a hypothesis, testing, and analysis. Although people commonly use the word "evidence," they use it too loosely; the tendency in conversation is to use "evidence" to mean "things which I perceive to be true,"

rather than “things that have been subjected to a test of their factual nature by agreed-upon rules.”

At this point, laypeople might object to all this as just so much intellectual hokum. Why does the average person need all this scholarly self-awareness? There’s always common sense. Why isn’t that good enough?

Most of the time, laypeople actually do not need any of this scholarly apparatus. In day-to-day matters, common sense serves us well and is usually better than needlessly complicated explanations. We don’t need to know, for example, exactly how fast a car can go in a rainstorm before the tires begin to lose contact with the road. Somewhere there’s a mathematical formula that would allow us to know the answer with great precision, but our common sense needs no such formula to tell us to slow down in bad weather, and that’s good enough.

When it comes to untangling more complicated issues, however, common sense is not sufficient. Cause and effect, the nature of evidence, and statistical frequency are far more intricate than common sense can handle. Many of the thorniest research problems often have counterintuitive answers that by their nature defy our common sense. (Simple observation, after all, told early humans that the sun revolved around the earth, not the other way around.) The simple tools of common sense can betray us and make us susceptible to errors both great and small, which is why laypeople and experts so often talk past each other even on relatively trivial issues like superstitions and folk wisdom.

WIVES’ TALES, SUPERSTITION, AND CONSPIRACY THEORIES

“Old wives’ tales” and other superstitions are classic examples of confirmation bias and nonfalsifiable arguments. Many superstitions

have some kind of grounding in experience. While it’s a superstition that you shouldn’t walk under ladders, for example, it’s also true that it’s *dangerous* to walk under a ladder. Whether you’ll have bad luck all day by annoying a house painter is a different matter, but it’s just dumb to walk under his ladder.

Superstitions are especially prone to confirmation bias, and they survive because common sense and confirmation bias sometimes reinforce each other. Are black cats unlucky? Cats, black or otherwise, by their nature tend to get underfoot, but we might only remember the black ones who trip us up. I actually live with a lovely black cat named Carla, and I can confirm that she is, on occasion, a menace to my navigation of the stairs. A superstitious person might nod here knowingly; the fact that Carla is also the *only* cat in the house, of course, or whether other cat owners have tumbled over their tabbies will mean nothing.

The most extreme cases of confirmation bias are found not in the wives’ tales and superstitions of the ignorant, but in the conspiracy theories of more educated or intelligent people. Unlike superstitions, which are simple, conspiracy theories are horrendously complicated. Indeed, it takes a reasonably smart person to construct a really interesting conspiracy theory, because conspiracy theories are actually highly complex explanations. They are also challenging intellectual exercises both for those who hold them and those who would disprove them. Superstitions are generally easy enough to disprove. Any statistician can verify that my cat is probably no more or less dangerous than any other on a staircase. Deep down, we know it anyway, which is why superstitions tend to be little more than harmless habits.

Conspiracy theories, by contrast, are frustrating precisely because they are so intricate. Each rejoinder or contradiction only produces a more complicated theory. Conspiracy theorists manipulate all tangible evidence to fit their explanation, but worse, they will also point to the *absence* of evidence as even stronger confirmation. After all, what

better sign of a really effective conspiracy is there than a complete lack of any trace that the conspiracy exists? Facts, the absence of facts, contradictory facts: everything is proof. Nothing can ever challenge the underlying belief.

These kinds of overcomplicated explanations violate the famous concept of “Occam’s Razor” (sometimes spelled “Ockham”), named for the medieval monk who advocated the straightforward idea that we should always begin from the simplest explanation for anything we see. We should only work our way up toward more complicated explanations if we need them. This is also called the “law of parsimony,” meaning that the most likely explanation is the one that requires the fewest number of logical leaps or shaky assumptions.

Imagine, for example, that we hear a noise, followed by someone swearing loudly in the next room. We run to the room and see a man, alone, holding his foot and jumping around with a grimace on his face. There’s an empty crate and broken bottles of beer all over the floor. What happened?

Most of us will derive a simple explanation that the man dropped the crate on the floor, hurt his foot, and yelped an expletive. We heard the crash and we’ve seen people swear when injured. We have a good grasp of what other people look like when they’re in pain, and the fellow is obviously hurting. It does not take many assumptions to create a reasonable explanation. It might not be a complete explanation, but it’s a sensible first cut, given the available evidence.

But wait. Maybe the man is an alcoholic, and he’s swearing because he’s angry that he dropped the crate and the beer is now gone. Or maybe he’s a temperance advocate, and he smashed the beer to the floor himself while cursing its vile existence. And perhaps he’s holding his foot and jumping around because he is from a little-known culture in the far Canadian Arctic where people’s faces are usually covered by parkas and they therefore express sorrow (or joy, or anger) by holding their feet and jumping. Or maybe he’s a

foreigner who thinks that certain pungent Anglo-Saxon words actually mean “Help, I dropped a crate of beer on my foot.”

This is where the law of parsimony comes in. Any one of those oddball and highly unlikely possibilities could be true, but it would be ridiculous to jump right to such immensely complicated theorizing when we have a far more direct and serviceable explanation staring us right in the face. We have no idea if the man is a teetotaler or a drunk, whether he’s from Canada or Cleveland, or whether his native language is English. While we can conduct some eventual investigation to find out whether any of those things are true, to start from any of those assumptions violates both logic and human experience.

If conspiracy theories are so complicated and ridiculous, why do they have such a hold on the popular imagination in so many societies? And make no mistake: they are in fact very popular and have been for centuries. Modern America is no exception. In the 1970s, for example, the novelist Robert Ludlum excelled at creating such conspiracies in a hugely popular series of novels, including one about a circle of political killers who were responsible for the assassination of President Franklin Roosevelt. (But wait, you say: FDR wasn’t assassinated. *Exactly.*) Ludlum sold millions of books and created the fictional superassassin Jason Bourne, who was the main character in a string of lucrative movies in the twenty-first century. Books, films, and television shows from *The Manchurian Candidate* in the 1960s to *The X-Files* thirty years later have had millions of fans.

In modern American politics, conspiracy theories abound. President Obama is a secret Muslim who was born in Africa. President Bush was part of the plot to attack America on 9/11. The Queen of England is a drug dealer. The US government is spraying mind-controlling chemicals in the air through the exhaust ports of jet aircraft. The Jews control everything—except when the Saudis or Swiss bankers are controlling everything.

One reason we all love a good conspiracy thriller is that it appeals to our sense of heroism. A brave individual against a great conspiracy, fighting forces that would defeat the ordinary person, is a trope as old as the many legends of heroes themselves. American culture in particular is attracted to the idea of the talented amateur (as opposed, say, to the experts and elites) who can take on entire governments—or even bigger organizations—and win. James Bond didn't confront the evil superconspiracy of SPECTRE until the British author Ian Fleming realized he needed something bigger than communism for Bond to fight when his novels started to move to the Hollywood screen for American audiences.

More important and more relevant to the death of expertise, however, is that conspiracy theories are deeply attractive to people who have a hard time making sense of a complicated world and who have no patience for less dramatic explanations. Such theories also appeal to a strong streak of narcissism: there are people who would choose to believe in complicated nonsense rather than accept that their own circumstances are incomprehensible, the result of issues beyond their intellectual capacity to understand, or even their own fault.

Conspiracy theories are also a way for people to give context and meaning to events that frighten them. Without a coherent explanation for why terrible things happen to innocent people, they would have to accept such occurrences as nothing more than the random cruelty either of an uncaring universe or an incomprehensible deity. These are awful choices, and even thinking about them can induce the kind of existential despair that leads a character in the nineteenth-century classic *The Brothers Karamazov* to make a famous declaration about tragedy: "If the sufferings of children go to make up the sum of the sufferings necessary to buy truth, then I protest that the truth is not worth such a price."

The only way out of this dilemma is to imagine a world in which our troubles are the fault of powerful people who had it within their

power to avert such misery. In such a world, a loved one's incurable disease is not a natural event: it is the result of some larger malfeasance by industry or government. Revelations of the horrid behavior of a celebrity are not evidence that someone we admired is evil: it is a plot to smear a beloved figure. Even the loss of our favorite sports team might be a fix. ("I don't want to see the Buffalo Bills winning the Super Bowl," the chief villain in *The X-Files* said in a 1996 episode. "As long as I'm alive, that doesn't happen.") Whatever it is, *somebody* is at fault, because otherwise we're left blaming only God, pure chance, or ourselves.

Just as individuals facing grief and confusion look for reasons where none may exist, so, too, will entire societies gravitate toward outlandish theories when collectively subjected to a terrible national experience. Conspiracy theories and the flawed reasoning behind them, as the Canadian writer Jonathan Kay has noted, become especially seductive "in any society that has suffered an epic, collectively felt trauma. In the aftermath, millions of people find themselves casting about for an answer to the ancient question of why bad things happen to good people."⁹ This is why conspiracy theories spiked in popularity after World War I, the Russian Revolution, the assassination of John F. Kennedy, and the terror attacks of September 2001, among other historical events.

Today, conspiracy theories are reactions mostly to the economic and social dislocations of globalization, just as they were to the aftermath of war and the advent of rapid industrialization in the 1920s and 1930s. This is not a trivial obstacle when it comes to the problems of expert engagement with the public: nearly 30 percent of Americans, for example, think "a secretive elite with a globalist agenda is conspiring to eventually rule the world," and 15 percent think media or government add secret "mind-controlling" technology to TV broadcasts. (Another 15 percent aren't quite sure about the television issue.) Nearly half of all respondents think it at least likely that Princess Diana of the United Kingdom was murdered in

a plot. "At these rates," as Kay rightly points out, "we can't speak of conspiracy thinking as a fringe phenomenon, nor one that has only a negligible impact on the civic sphere and cultural values."

Conspiracy theories are not harmless. At their worst, conspiracy theories can produce a moral panic in which innocent people get hurt. In the early 1980s, for example, hysteria swept the United States when many parents became convinced that Satanic sex cults were operating inside children's day-care centers. Faux "experts" helped to fuel the panic, interpreting every confused utterance from a toddler as confirming abuse of the weirdest kind. It goes without saying that child abuse exists, but a grandiose theory—which likely reflected the fears and guilty feelings of working parents more than anything else—took hold of the American imagination, damaging numerous lives forever and temporarily clouding better approaches to a very real but far more limited problem.¹⁰

If trying to get around confirmation bias is difficult, trying to deal with a conspiracy theory is impossible. Someone who believes that the oil companies are suppressing a new car that can run on seaweed is unlikely to be impressed by your new Prius or Volt. (That's the efficient car the industrial barons will *allow* you to have.) The people who think alien bodies were housed at Area 51 won't change their minds if they take a tour of the base. (The alien research lab is underground, you see.)

Arguing at length with a conspiracy theorist is not only fruitless but sometimes dangerous, and I do not recommend it. It's a treadmill of nonsense that can exhaust even the most tenacious teacher. Such theories are the ultimate bulwark against expertise, because of course every expert who contradicts the theory is *ipso facto* part of the conspiracy. As the writer Jef Rouner has put it,

You have to remember that the sort of person who readily subscribes to conspiracy theories already fears that there are vast,

powerful forces maliciously allied against the areas of life that mean the most to them. Any denial of the threat increases the power of the threat by virtue of its being allowed to operate undetected.¹¹

That's a place in a conversation where none of us wants to be.

Fortunately, these large-scale cases of irrationality are far and few between. The more prosaic and common unwillingness to accept expert advice, however, is rooted in the same kind of populist suspicion of those perceived as smarter or more educated than the general public. The damage might be less dramatic, but it is no less tangible, and sometimes quite costly.

STEREOTYPES AND GENERALIZATIONS

"You can't generalize like that!" Few expressions are more likely to arise in even a mildly controversial discussion. People resist generalizations—boys tend to be like *this*, girls tend to be like *that*—because we all want to believe we're unique and that we cannot be pigeonholed that easily.

What most people usually mean when they object to "generalizing," however, is not that we shouldn't generalize, but that we shouldn't *stereotype*, which is a different issue. The problem in casual discourse is that people often don't understand the difference between stereotypes and generalizations, and this makes conversation, especially between experts and laypeople, arduous and exhausting. (I realize, of course, that I am generalizing here. But bear with me.)

The difference matters. Stereotyping is an ugly social habit, but generalization is at the root of every form of science. Generalizations are probabilistic statements, based in observable facts. They are not, however, explanations in themselves—another important difference

from stereotypes. They're measurable and verifiable. Sometimes generalizations can lead us to posit cause and effect, and in some cases we might even observe enough to create a theory or a law that under constant circumstances is always true.

It is a generalization, for example, to say that "people in China are usually shorter than people in America." That may or may not be true. People who mistake this for a stereotype will immediately rush to find exceptions, and discussion will quickly run into a ditch: "I think Chinese people tend to be shorter than Americans." "You can't generalize like that! Chinese-born basketball player Yao Ming is seven and a half feet tall!"

The existence of an unusually tall Chinese basketball player proves nothing either way. We can settle this question only by going to the United States and China, measuring people, and seeing how often our assumption is true. If it's the case that Chinese people overall are shorter than Americans, then we've only noted something that is factually true enough times that we would not be wrong to assert it as a general but not infallible rule.

The hard work of explanation comes after generalization. *Why* are Americans taller than the Chinese? Is it genetic? Is it the result of a different diet? Are there environmental factors at work? There are answers to this question somewhere, but whatever they are, it's still not wrong to say that Americans tend to be taller than the Chinese, no matter how many slam-dunking exceptions we might find.

To say that *all* Chinese people are short, however, is to stereotype. The key to a stereotype is that it is impervious to factual testing. A stereotype brooks no annoying interference with reality, and it relies on the clever use of confirmation bias to dismiss all exceptions as irrelevant. (Racists have mastered this mode of argument: "All Romanians are thieves except this one lady I work with, but she's different.") Stereotypes are not *predictions*, they're *conclusions*. That's why it's called "prejudice": it relies on pre-judging.

The tangle comes when we make generalizations that are negative or rooted in arguable criteria. No one can really dispute a generalization about height; it's something easily measurable in ways we all accept. Nor do we impute any sort of moral or political character to height. "Tall, aren't you?" a femme fatale says to the literary detective Phillip Marlowe in the 1939 novel *The Big Sleep*. "I didn't mean to be," Marlowe replies. It's witty precisely because we know being short or tall isn't something we control or for which we have to apologize.

Negative generalizations, however, raise hackles, especially when they are based on arguable definitions. To say that "Russians are more corrupt than Norwegians," for example, is true but only if we adopt a shared definition of "corrupt." By Western definitions, Russia is plagued by corruption, but it's also a perfectly reasonable objection to note that one culture's "corruption" is another culture's "favors." This is why generalizations need to be as carefully formulated as possible if they are to serve as basis for future research. There is a clear difference between "Russians in official positions are more willing to break established rules in conducting government business than Norwegians in similar offices" as opposed to a broader statement that "Russians are more corrupt than Norwegians."

If we apply those narrower filters, we have a statement that is far less inflammatory and measurably true. Again, however, we have no idea why it's generally true. We know only that if we apply the same criteria consistently—that is, if we watch the same Russian and Norwegian officials process the same transactions enough times—we can establish something that is more often true than false. It may be that Russian laws are outdated and impossible to follow even for the most honest bureaucrat. (That's a bit of a stretch, but there's an element of truth in it, and it is an argument made quite often by actual Russians.) That's where more research comes in: to establish the *why* after confirming the *what*.

Of course, in daily conversation, none of this matters very much. These things may be true in some narrow, definable sense, but who wants to hear things that, if given without context, sound only like inflammatory assertions? Conversations among laypeople, and between laypeople and experts, can get difficult because human emotions are involved, especially if they are about things that are true in general but might not apply to any one case or circumstance.

That's why one of the most important characteristics of an expert is the ability to remain dispassionate, even on the most controversial issues. Experts must treat everything from cancer to nuclear war as problems to be solved with detachment and objectivity. Their distance from the subject enables open debate and consideration of alternatives, in ways meant to defeat emotional temptations, including fear, that lead to bias. This is a tall order, but otherwise conversation is not only arduous but sometimes explosive.

I'M OK, YOU'RE OK—SORT OF

There are other social and psychological realities that hobble our ability to exchange information. No matter how much we might suffer from confirmation bias or the heavy hand of the Dunning-Kruger Effect, for example, we don't like to tell people we know or care about that they're wrong. (At least not to their face.) Likewise, as much as we enjoy the natural feeling of being right about something, we're sometimes reluctant to defend our actual expertise. And overall we find it hard to separate the information, erroneous or otherwise, that serves as the foundations of our political and social beliefs from our self-image and our conceptions about who we are.

In 2014, for example, an international study reached a surprising conclusion: people will go to great lengths to give each other a fair hearing and to weigh all opinions equally, even when everyone

involved in the conversation knows there are substantial differences in competence between them. The authors of the study (which included people from China, Iran, and Denmark) suggest that this is an "equality bias" built into us based on a human need to be accepted as part of a group. When two people were involved in repeated discussions and decision making—and establishing a bond between the participants was a key part of the study—researchers found that the less capable people advocated for their views more than might have been expected, and that the more competent member of the conversation deferred to those points of view even when they were demonstrably wrong.¹²

At first, this sounds like nothing more than good manners and a desire for acceptance. Each party wanted to stay relevant to the other, rather than risk disrupting the relationship. The less competent person wanted to be respected and involved by not being seen as wrong or uninformed. The more competent person, meanwhile, did not want to alienate anyone by being consistently right.

This might make for a pleasant afternoon, but it's a lousy way to make decisions. As Chris Mooney, a *Washington Post* science writer, noted, this kind of social dynamic might grease the wheels of human relationships, but it can do real harm where facts are at stake. The study, he wrote, underscored "that we need to recognize experts more, respect them, and listen to them. But it also shows how our evolution in social groups binds us powerfully together and enforces collective norms, but can go haywire when it comes to recognizing and accepting inconvenient truths."¹³

Why can't people simply accept these differences in knowledge or competence? This is an unreasonable question, since it amounts to saying "Why don't people just accept that other people are smarter than they are?" (Or, conversely, "Why don't smart people just explain why other people are dumber than they are?") The reality is that social insecurity trips up both the smart and the dumb. We all want to be liked.

In a similar vein, few of us want to admit to being lost in a conversation, especially when so much information is now so easily accessible. Social pressure has always tempted even intelligent, well-informed people to pretend to know more than they do, but this impulse is magnified in the Information Age. Karl Taro Greenfeld, a novelist and writer, described this kind of anxiety in a meditation on why people attempt to “fake cultural literacy.”

What we all feel now is the constant pressure to know enough, at all times, lest we be revealed as culturally illiterate. So that we can survive an elevator pitch, a business meeting, a visit to the office kitchenette, a cocktail party, so that we can post, tweet, chat, comment, text as if we have seen, read, watched, listened. What matters to us, awash in petabytes of data, is not necessarily having actually consumed this content firsthand but simply knowing that it exists—and having a position on it, being able to engage in the chatter *about* it. We come perilously close to performing a pastiche of knowledgeability that is really a new model of know-nothingness.¹⁴

People skim headlines or articles and share them on social media, but they do not read them. Nonetheless, because people want to be perceived by others as intelligent and well informed, they fake it as best they can.

As if all of this weren't enough of a challenge, the addition of politics makes things even more complicated. Political beliefs among both laypeople and experts work in much the same way as confirmation bias. The difference is that beliefs about politics and other subjective matters are harder to shake, because our political views are deeply rooted in our self-image and our most cherished beliefs about who we are as people.

As Konnikova put it in her examination of the fraudulent gay-marriage study, confirmation bias is more likely to produce “persistently false beliefs” when it stems “from issues closely tied to our conception of self.” These are the views that brook no opposition and that we will often defend beyond all reason, as Dunning noted:

Some of our most stubborn misbeliefs arise not from primitive childlike intuitions or careless category errors, but from the very values and philosophies that define *who we are* as individuals. Each of us possesses certain foundational beliefs—narratives about the self, ideas about the social order—that essentially cannot be violated: To contradict them would call into question our very self-worth. As such, these views demand fealty from other opinions.

Put another way, what we believe says something important about how we see ourselves as people. We can take being wrong about the kind of bird we just saw in our backyard, or who the first person was to circumnavigate the globe, but we cannot tolerate being wrong about the concepts and facts that we rely upon to govern how we live our lives.

Take, for example, a fairly common American kitchen-table debate: the causes of unemployment. Bring up the problem of joblessness with almost any group of laypeople and every possible intellectual problem will rear its head. Stereotypes, confirmation bias, half-truths, and statistical incompetence all bedevil this discussion.

Consider a person who holds firmly, as many Americans do, to the idea that unemployed people are just lazy and that unemployment benefits might even encourage that laziness. Like so many examples of confirmation bias, this could spring from personal experience. Perhaps it proceeds from a lifetime of continuous employment, or

it may be the result of knowing someone who's genuinely averse to work. Every "help wanted" sign—which confirmation bias will note and file away—is further proof of the laziness of the unemployed. A page of job advertisements or a chronically irresponsible nephew constitutes irrefutable evidence that unemployment is a personal failing rather than a problem requiring government intervention.

Now imagine someone else at the table who believes that the nature of the American economy itself forces people into unemployment. This person might draw from experience as well: he or she may know someone who moved to follow a start-up company and ended up broke and far from home, or who was unjustly fired by a corrupt or incompetent supervisor. Every corporate downsizing, every racist or sexist boss, and every failed enterprise is proof that the system is stacked against innocent people who would never choose unemployment over work. Unemployment benefits, rather than subsidizing indolence, are a lifeline and perhaps the only thing standing between an honest person and complete ruin.

There's a real argument to be had, of course, about the degree to which any of this is true, but these two people—admittedly, drawn as caricatures for our purposes here—are not going to be the ones to have it. It's unarguable that unemployment benefits suppress the urge to work in at least *some* people; it's also undeniable that *some* corporations have a history of ruthlessness at the expense of their workers, whose reliance on benefits is reluctant and temporary. This conversation can go on forever, because both the Hard Worker on one side and the Kind Heart on the other can adduce anecdotes, carefully vetted by their own confirmation bias, that are always true but are in no way dispositive.

There's no way to win this argument, because in the end, there are no answers that will satisfy everyone. Laypeople want a definitive answer from the experts, but none can be had because there is not one answer but many, depending on circumstances. When do

benefits encourage sloth? How often are people thrown out of work against their will, and for how long? These are nuances in a broad problem, and where our self-image is involved, nuance isn't helpful. Unable to see their own biases, most people will simply drive each other crazy arguing rather than accept answers that contradict what they already think about the subject. The social psychologist Jonathan Haidt summed it up neatly when he observed that when facts conflict with our values, "almost everyone finds a way to stick with their values and reject the evidence."¹⁵

This tendency is in fact so strong that a fair number of people, regardless of political affiliation, will shoot the messenger rather than hear something they don't like. A 2015 study, for example, tested the reactions of both liberals and conservatives to certain kinds of news stories, and it found that "just as conservatives discount the scientific theories that run counter to their worldview, liberals will do exactly the same."¹⁶ Even more disturbing, the study found that when exposed to scientific research that challenged their views, both liberals and conservatives reacted by doubting the *science*, rather than themselves. "Just reading about these polarizing topics," one of the authors noted, "is having a negative effect on how people feel about science."

This is why, as we'll see later in this book, the only way to resolve these debates in terms of policy choices is to move them from the realm of research to the arena of politics and democratic choice. If democracy is to mean anything at all, then experts and laypeople have to solve complicated problems together. First, however, they have to overcome the widening gulf between them. More education seems like an obvious solution, but in the next chapter we'll see that education, at least at the college level, is now part of the problem.