Chapter 4: Fallacies of Weak Induction[1]

A Little More Logical | Brendan Shea, Ph.D. (Brendan.Shea@rctc.edu)

1 CONTENTS

2 FALLACIES OF WEAK INDUCTION

Fallacies of weak induction are weak inductive arguments in which the premises are evidentially relevant to the conclusion (unlike fallacies of relevance), but are not strong enough to justify belief in the conclusion without being supported by additional premises. Any argument that commits a fallacy of weak induction is (unsurprisingly) a weak inductive argument. These fallacies are often related to **confirmation bias**, which occurs when a person overestimates the strength of evidence that supports existing beliefs and underestimates the power of evidence against them.

[1] [1] Unless explicitly noted otherwise, all the art in this chapter is from Ali Almossawi's excellent *Book of Bad Arguments,* which is free for non-commercial use. See the book here: https://bookofbadarguments.com/.

In this section, we'll be examining the structure of several fallacies of weak induction, as well as what separates these fallacious arguments from stronger arguments of the same type. The fallacies we will address include hasty generalization, several varieties of the "false cause" fallacy, appeal to unqualified authority, and weak induction.

2.1 HASTY GENERALIZATIONS AND ANECDOTAL EVIDENCE

A generalization is a common form of inductive argument that involves drawing conclusions about populations from evidence concerning samples. One general form is as follows:

- Premise: In sample S, X% of those studied have trait T.
- Conclusion: In the population P as a whole, around X% of everyone has trait T.

Such arguments are always inductive and can be either strong/weak or cogent/uncogent. The fallacy of **hasty generalization** fallacy occurs when the sample that one has chosen is NOT likely to be representative of the population as a whole. This might be simply because the sample is small, or because the sample has been chosen using a biased procedure of some type. For example, it's almost always a bad idea to make claims about large groups based on "things that happened to me" or "stories about individuals I read/watched." Some examples of this fallacy include:

Figure 1 From the "Book of Bad Arguments."

- "A poll of 1,000 likely college students shows that a majority support legalizing marijuana. So, a referendum in favor of legalizing marijuana is likely to succeed." [Problem: This is a biased sample since not all voters are college students.]
- "Mark Maguire, Sammy Sosa, and Barry Bonds only hit over 50 home runs in a season because they cheated. It must be that anyone who hits over 50 home runs in a season is cheating." [Problem: This is a small sample. Also, these players all played baseball around the same time, and it could be that steroids were more common during this era than in other times.]
- "My friend had his cheese sandwich stolen by two teens wearing Green Bay Packers jerseys. So, most Green Bay Packers fans must be criminals." [Again, a small and biased sample.]

As the last example shows, hasty generalizations often occur when too much weight is given to **anecdotal evidence** concerning a small number of cases (often, the arguer's personal experience, the experience of his acquaintances, or things he's read/seen on TV or the internet). And while this example might be a silly one, bad inferences of this type play a significant role in maintaining racist, sexist, religious, etc. stereotypes, since people can almost find some story that seems to support their view. The problem is that stories about individuals (even exciting and memorable ones! And even ones that happened to you!) are not strong evidence of what is true more generally.

[Question: Give an example of a "hasty generalization" that involves "anecdotal evidence". These are super common! Whenever we reason from "here's a story about something that happened to a particular person. So, here's the truth about politics, medicine, life, etc., we are doing this.]

2.2 FALLACIES ABOUT CAUSATION

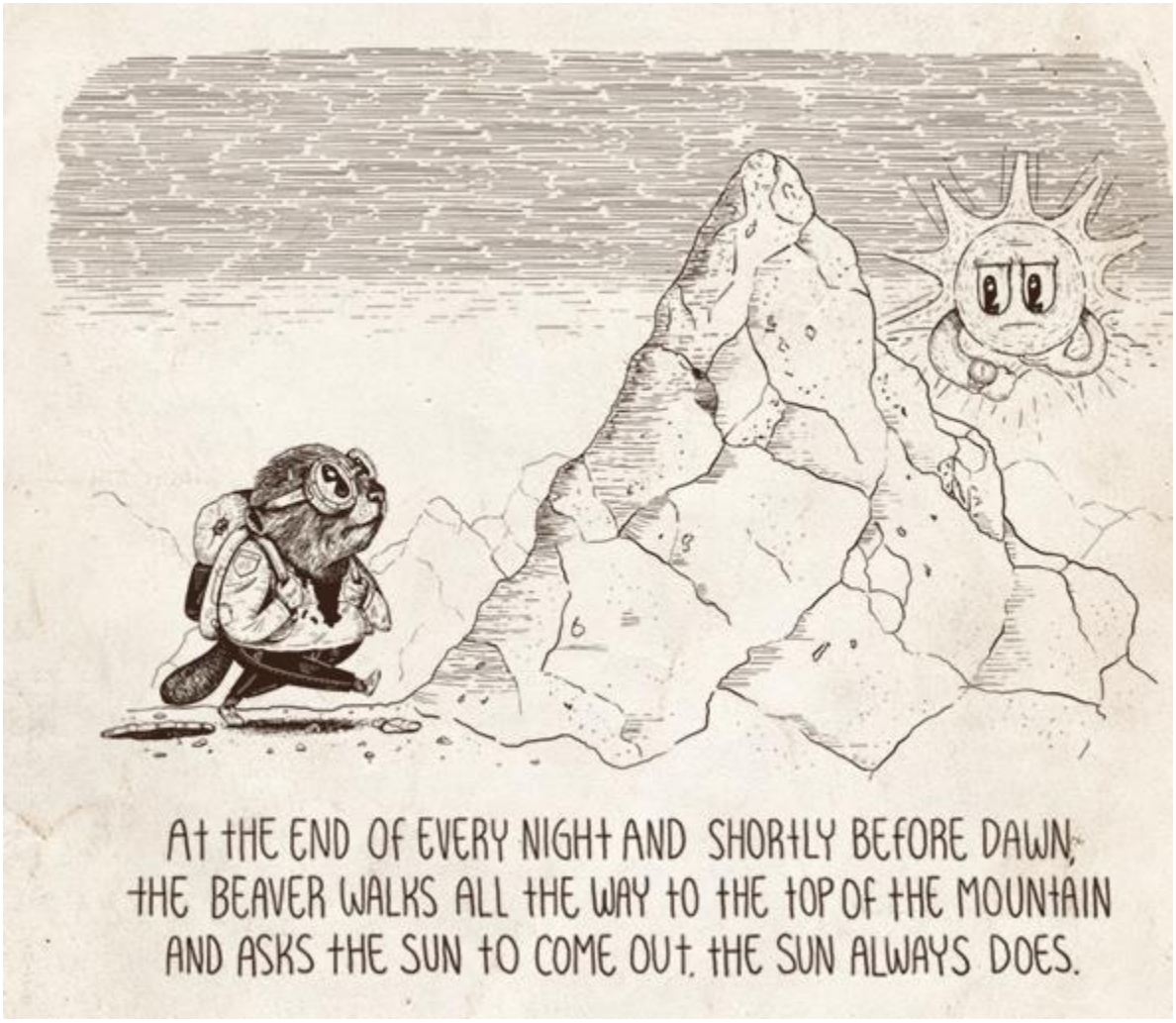

Figure 2 A causal fallacy. From "The Book of Bad Arguments."

Another form of inductive argument involves inferences about causes and effects. As with generalizations, such arguments play a massive role in our day-to-day lives, and they can be strong or weak, cogent or uncogent. The fallacy of **false cause** occurs when the premises fail to support the existence of a causal connection that the conclusion depends on. Logicians have discovered many forms of this fallacy, several of which have been given formal names. As with hasty generalizations, it isn't always apparent to the casual onlooker whether arguments commit these fallacies, since they appear superficially similar to reasonable arguments. However, the problems will be apparent who knows something about the argument's content.

Form	Example	Problem
X causally contributed to Y. So, X is the sole or most important cause of Y.	"The southern states' desire to have their own flag contributed to their decision to secede from	Events often have multiple causes, and not all causes are equally important. It's almost

	the U.S. So, these states' decision to secede had nothing to do with slavery."	always illegitimate to assume that just because you've found ONE cause of something, there can't be other causes.
Post hoc ergo propter hoc. Y happened after X happened. So, Y happened because of X.	"Aunt Edna took aspirin right before she died. So, her taking aspirin must have caused her death."	In general, the fact that X happened before Y only very weakly supports the claim that X caused Y. Much more evidence is needed to establish the connection between X and Y.
Non causa pro causa ("not the cause for the cause"). X and Y are correlated. So, changing the value of X will change the value of Y.	"People who spend lots of time in the hospital often die young. So, we could increase human life expectancy by closing hospitals."	While it's true that a correlation between two things (hospitals and life expectancy) usually means there is *some* causal link between them, it doesn't mean it is a simple case of one causing the other. (In many cases, there is some other factor that causes them both.).
Gambler's fallacy. Y happens X% of the time. In the recent past, Y has happened <X% of the time. So, Y is likely to happen next time.	A fair coin came up heads six times in a row. Therefore, it is very likely to come up tails next time. [The chance of tails is always 50%]	This is called the "gambler's fallacy" since it often takes the form of "I've been losing so much that I'm due for a win—I'd better keep playing!" The problem is that, in most games of chance, the chance of winning or losing never changes since each instance of the game is *independent*.
Slippery slope: "If A happens, then B, C, D,…, and Z will happen. Since Z is unacceptable, so is A."	"If we allow the military to torture known enemy combatants, then we must allow them to torture suspected terrorists, then rude foreign civilians, and finally innocent American children. So, we must ban torture. "	Slippery slopes become weaker with (a) more steps and (b) weaker causal connections between individual steps. The longer and more gradual the slope is, the less likely we are to "slide down it."

[Question: One example of fallacies of causation is superstitions about things that are lucky/unlucky. What are some examples of these superstitions? What might be the problem with this sort of reasoning?]

2.3 OTHER FALLACIES OF WEAK INDUCTION

Suppressed Evidence. Inductive arguments, unlike deductive arguments, can be strengthened or weakened by adding new premises. The fallacy of **suppressed evidence** occurs when an arguer leaves out a premise they know (or should know) would substantially weaken an inductive argument.

- Tylenol is easier on your stomach than Advil. [No benefits of taking Advil are mentioned.] Therefore, you should always take Tylenol for aches and pains.
- No woman has ever been president of the United States. [Nothing is mentioned about the changes in society over the last few hundred years.] Therefore, no woman will ever become president of the United States.

Appeal to Ignorance: "Because C has not been (deductively) proven false, C is reasonable to believe." This fallacy often occurs because of an inappropriate demand for deductive proof. Many false statements ("Unicorns exist", "Elvis is currently living in Minneapolis") cannot be proven false. This does not mean that such statements are reasonable to believe.

- Because we cannot prove that giving money to Oxfam helps feed starving children in Africa, it's probably the case that giving money to Oxfam is a complete waste of your money.
- Because we cannot prove that atomic nuclei are composed of protons and neutrons, we must also admit the possibility that they are made of cotton candy.

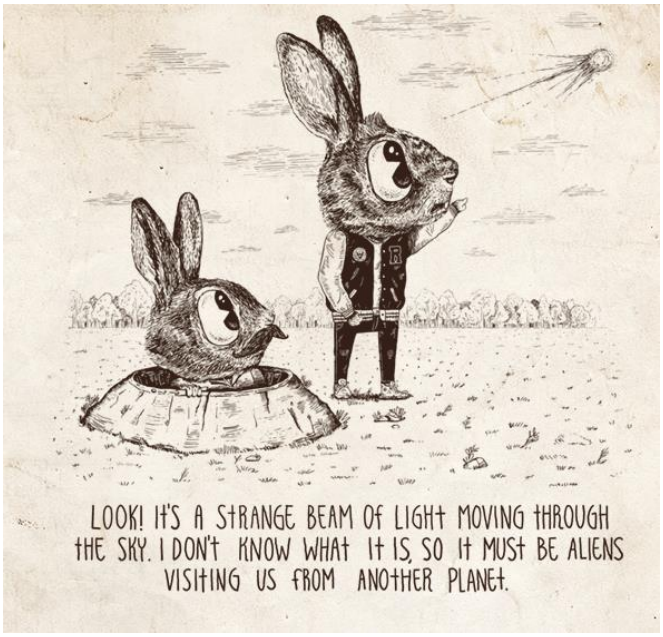

Figure 3 From the "Book of Bad Arguments."

Appeal to Unqualified or Inappropriate Authority. In an appeal to unqualified authority, a conclusion is supported by citing an authority that lacks expertise, is biased, or is otherwise unreliable. Qualified authorities should be unbiased subject matter experts. In some cases, you might need a separate argument to establish the authority's credentials. If two equally competent authorities disagree about the truth of the conclusion, the premises must also acknowledge this. To do otherwise would be to suppress evidence.

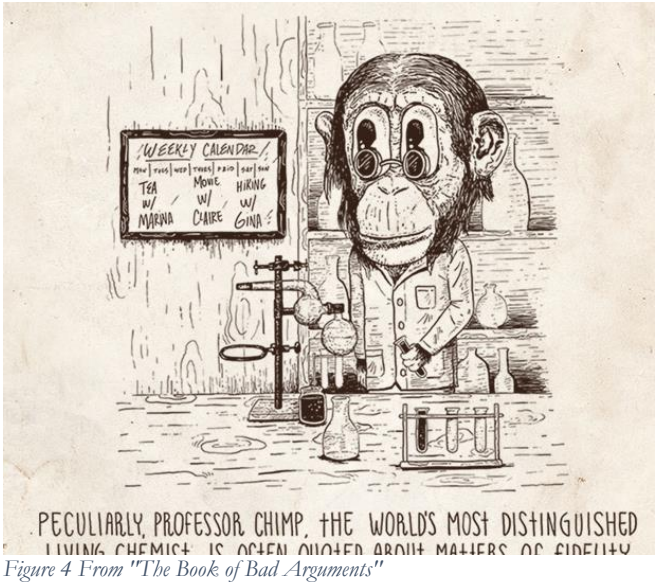

Figure 4 From "The Book of Bad Arguments"

- My cousin Bonnie is an expert hunter, and she claims that gun ownership makes people better, more responsible citizens.
- My other cousin Brad lost a child to a gun accident. He claims society would be safer if we banned private ownership of guns.
- The "Americans in Favor of Guns' Rights" website claims that universal ownership of handguns would lower the crime rate by 60%. So, adopting this sort of legislation would probably lower the crime rate by 60%.
- The "Americans for Gun Control Website" claims banning handguns would cut suicide rates by 60%. So…(you get the point).

Note: The takeaway here is not "we should just ignore data" or "you should just believe whatever you want since you can always find an expert to agree with you." Instead, you should generally follow the *consensus opinion* of experts on a subject. In many cases, this can be easy to find (e.g., most textbooks provide this sort of info.). In highly charged political issues, it might be much more difficult (and in these cases, it might be best to use other forms of inductive reasons besides arguments from authority). Finally, when reviewing claims from interested groups, you shouldn't dismiss them entirely. Instead, look at what the "other side" might say, where each side has obtained its data, etc.).

[Question: Consider a topic that interests you (and which you know about). Who might count as unqualified/biased authorities in this domain? Who would count as qualified authorities?]

2.4 ARGUMENTS FROM ANALOGY

An **argument from analogy** is an inductive argument that depends on a claim of similarity. It has the general form "Objects X1, X2, and X3 have properties A, B, C. Object X4 has properties A and B. So, X4 probably has C as well." The strength of an argument from analogy depends on:

1. The number and diversity of primary analogs (X1, X2, X3).
2. The number and relevance of the shared properties (A, B, C).
3. The number and relevance of any *disanalogies* between the objects mentioned in the premise and the object mentioned in the conclusion.
4. The strength of the conclusion. All other things being equal, an argument with a conclusion that makes a strong claim is *weaker* than an argument whose conclusion is weaker. This holds for all inductive arguments.

Analogies in Moral Arguments. Arguments from analogy often play a central role in moral and legal reasoning:

- Adult human beings with severe cognitive disabilities are capable of feeling pain, and it is wrong to kill them. So, it is wrong to kill animals with similar cognitive capacities that are capable of feeling pain.
- Adult human beings with severe cognitive disabilities are capable of feeling pain, and it is wrong to kill them. So, it is wrong to kill human fetuses with similar cognitive capacities that are capable of feeling pain.

In both arguments, we go from generally accepted moral facts (about the immorality of killing adult humans with disabilities) to often-disputed moral conclusions (about killing animals or fetuses). To *criticize* these arguments, you must identify (1) dissimilarities between the cases or (2) primary analogs that would lead to a different conclusion.

Weak Analogies (Fallacy). A weak analogy is a fallacious argument from analogy. Analogies are weak to the degree they do not meet the mentioned criteria. The strength of an argument from analogy directly varies with how similar the cases mentioned in the premises are to the case mentioned in the conclusion. Also, remember not to suppress evidence—a cogent argument from analogy should not leave out information that would significantly weaken the argument.

- Children often enjoy having small domestic cats as pets. So, since tigers are the same species as domestic cats, children would also enjoy keeping baby tigers as pets.
- LeBron James is tall and is very good at basketball. I am very tall. Therefore, I would be very good at basketball.

[Question: Produce an "argument from analogy" for the claim "you ought to take a logic class." Now, say whether this is a strong or weak argument, and explain why.]

2.5 SOLVED PROBLEMS

Determine which fallacy, if any, is committed by the following passages. In these problems, I've focused on diet-related claims, which often involve these sorts of fallacies. The point here is NOT that any of these diets is particularly good or bad (that's beyond the scope of a logic class!), but instead to think about what it means to provide *good evidence* for these sorts of (inductive) claims.

Passage	**Analysis**
Dr. Oz says that I can lose weight by eating garcinia extract. Since he's a doctor, I should do what he says.	Appeal to Inappropriate Authority**.** While Dr. Oz may be a doctor, he isn't the *only* doctor, and his opinion hardly represents a consensus of experts. If you wanted to know what to think of this claim, you'd want to do some research and see the *consensus* view on this. (In the case of nutrition, the scientific consensus is usually reflected in publications by government agencies like the Food and Drug Administration, major medical institutions like Mayo Clinic or Cleveland Clinic, and by diet recommendations of groups like the American Heart Institute.)
Six weeks ago, I cut gluten (or meat, or milk, or whatever) from my diet, and look how much weight I've lost, and how much better I feel. I can only conclude that [specific food item x] was the cause of my weight gain or ill health.	False Cause (non causa pro causa/post ergo propter hoc). The case of diets provides an especially clear example of how this fallacy. It can seem *obvious* to people that the most recent diet they've engaged in was "the cause" of their weight loss. However, this is almost always an unjustified conclusion, since there are things happening *besides* merely cutting out this food item that might bear a causal relationship to the weight loss (for example, people might just be eating less food, or have changed their exercise habits, etc.). This is why things like scientific studies are so important.
I lost 10 pounds in the first two months of my diet. So, I can reasonably expect to lose 50 pounds over the next 10 months.	Hasty Generalization. The first two months of a new diet are *not* an unbiased sample of what the future holds. In most cases, people will put on much of the weight they've lost.
In a study of mice, a group of mice that were forced to fast for 12 hours a day lived 20% longer than mice that ate all. [Implicit: humans are mice are similar in that they are mammals, etc.] Therefore, I could extend my life span by 20% by fasting for 12 hours a day.	Weak Analogy. The weak analogy here is between mice and humans. The problem is not that we can't learn *anything* from studying mice (we can!), but that it's unlikely that an individual human will respond precisely the same way the mice do (as this argument claims). This argument ignores these differences between humans and mice, and then proceeds to make a *very* strong claim about what will happen to a certain human. If the conclusion were weaker ("it might improve my health to take a break from eating now and again") the argument itself would be stronger.
My physician said that my cholesterol was very high, and that I should consider changing my diet. I talked to a nutritionist who agreed. They told me I should consider following the "DASH diet." So, my health will improve if I do this.	No fallacy. Note that, because of the inductive nature of this argument, you still might be wrong about the conclusion! And it may well be that new evidence will eventually cause you to revisit this conclusion. However, it is reasonable to act on this evidence (expert advice rooted in scientific consensus).
There's lots of scientific disagreement about diets, and no one has conclusively shown the best diet. So, who are you to say that my diet of "eat all the doughnuts, all the time" is bad?	Appeal to Ignorance. It's true that many questions about nutrition (and with science generally) are unsolved. It's also true that there's no way of mathematically proving that any crazy diet idea won't work. However, this does NOT mean that the evidence supports all diets equally or that we don't have solid evidence against your crazy diet.

Lots of people I've talked to said they lost weight after stopping eating food item F. I also read many stories of people on the internet who did the same thing. Obviously, everyone could lose weight by doing this.	Hasty Generalization. For any given popular diet (including many entirely at odds with one another), you can almost *certainly* find anecdotal evidence to support it via the testimony of friends, social media, news stories, your own experience, etc. However, gathering data in this way is highly biased (since you are almost sure to encounter many more stories of successes than failures.).
I saw a news article about a scientific study that provided some support for diet X. Hence, that diet is clearly the way to go!	Suppressed Evidence. As is the case with many other issues, there are a LOT of studies on nutrition. While new studies are relevant, it is fallacious to ignore/suppress evidence against diet X in making a decision.
Diets A, B, and C have all failed me. This just means that diet D is all the more likely to work!	Gambler's fallacy. There's no particular reason to think that failing on one diet makes another's succeeding any more likely.

2.6 REVIEW QUESTIONS

1. Give an example of a phenomenon (from the news, movies, or your own life) that you think illustrates *confirmation bias*.
2. Inductive reasoning is crucial for our lives—we NEED to generalize from experience, make inferences about causes and effects, and use analogies to understand new things. However, as this section suggests, we don't always do this well. What are some ways that we might get better at this?
3. Which fallacies of weak induction, if any, do you think that you personally are most prone to? Why do you think this is? Can you give some examples?

3 FALLACIES IN ACTION: ARGUING ABOUT GOD

Philosophers, theologians, and logicians have been arguing about God for a *long, long* time. Plus, most people have some opinion about whether God exists, so it's a question of inherent interest. With that in mind, we'll look at some of the most popular arguments for and against God with an eye toward figuring out the difference between good and *bad* arguments. This chapteer will assume that "God" means the traditional Jewish-Christian-Islamic God (all-powerful, all-knowing, and all-loving). Such arguments have played a central role in the historical development of logic. Because reasoning about God is so tricky, it has led to the development of new forms of reasoning and critiques of these forms.

The goal of this lesson is NOT to defend any particular conclusion about God. Instead, the goal will be to learn to distinguish between two (very different) things:

1. Whether or not you agree with the conclusion of a particular argument.
2. Whether or not the argument is fallacious.

Making this distinction is a crucial skill. However, it requires a surprising amount of dedication and practice to do this reliably. It often seems our brains "want" to ignore problems with arguments whose conclusions we like, even as they are quick to pick up on errors (real or imagined) when we consider arguments with conclusions opposed to ours.

[Question: Before reading the rest of this, try to come up with (1) the strongest argument FOR the existence of God you can think of and (2) the strongest argument AGAINST the existence of God you can think of. When you're done, come back, and see what you think of them!]

3.1 INFORMAL LOGIC: A VERY QUICK REVIEW

Philosophers define **logic** as the study of **arguments.** Here, "argument" does NOT mean "yelling match between two people." Instead, it simply means a group of statements in which one or more of the statements (called the **premises**) are offered as reasons/evidence to believe another of the statements (which we call the **conclusion**). When thinking about arguments, there are some important things to keep in mind:

1. Not everything is an argument, even if it is something people might disagree with! In particular, you aren't arguing if you simply report what you believe ("I believe in God") or explain something ("The reason I don't believe in God is that my parents were atheists"). Arguments exist only when there is a claimed **inferential link** between premises and conclusions.
2. Arguments, and their logical analysis, can happen (and often do happen) entirely within the confines of our own heads. More specifically, we "argue" whenever we try to figure out what we should believe based on the evidence we've accumulated. So, you don't need to be "argumentative" to get something out of logic: you just need to be interested in making sure your beliefs are as accurate as they can be, given your evidence.
3. There are two types of arguments: **deductive** and **inductive.** In a deductive argument, the arguer claims that it is LITERALLY IMPOSSIBLE (inconceivable!) that the premises could be true and the conclusion could be false. We'll see a few arguments for/against God like this. In inductive arguments, the claim is simply that the truth of the premises makes the falsity of the conclusion improbable. (It's important to remember that this distinction concerns the strength of the inferential link, and NOT "how certain you feel about the conclusion." Deductive arguments can have false conclusions! Inductive arguments can have true conclusions!).
4. In evaluating any argument, you need to do at least three things. First, clearly separate out premises and conclusion (e.g., by putting the argument in **standard form**). Second, on the assumption that the premises are true, ask yourself, "Does the conclusion follow?" If so, is the argument inductively **strong** or deductively **valid?** Finally, ask yourself whether the premises are actually TRUE. (Note: at no point do you simply ask "Do I agree with the conclusion?" After all, the goal here is to determine whether or not we actually have good reason to believe the conclusion. We shouldn't simply start by assuming an answer to this!).
5. There are precisely two types of "good" arguments: an inductively strong argument with true premises (a **cogent** argument) and a deductively valid argument with two premises (a **sound** argument). By contrast, there are many way of arguing/reasoning badly: an inductive argument might be weak, a deductive argument might invalid, or the premises might be false. Over the past 2,000 years, philosophers have identified some of the most common ways of reasoning badly as **fallacies.** Fallacies can roughly be understood as arguments that have something wrong with them besides *merely* having false premises. The basic idea is as follows: you haven't committed a fallacy if you base your argument on the best information that you have, but this information turns out to be wrong. A fallacy is the sort of argument where you really should have known better.
    a. Common deductive arguments include mathematical "proofs", categorical arguments (words like "All", "No", "Some"), or arguments based *merely* on the meanings of words.
    b. Common inductive arguments include predictions about the future, inferences about causes/effects, reasoning based on "authority" (this happens EVERY SINGLE TIME you believe something because you read it, or were told it, etc.), generalizations, arguments by analogy, etc.
6. Fallacies can occur in a variety of ways:

a. A deductive argument might have a bad "form," and thus be invalid. We call these **formal fallacies.**
b. The argument might deductively valid or inductively strong, but rely on premises that are obviously unacceptable, given the context. Logicians sometimes call these **fallacies of presumption.**
c. An inductive argument might have TRUE premises, but these premises fail to provide adequate support for the conclusion. This might be because the premises are completely irrelevant to the conclusion (**fallacies of relevance**) or because they simply don't provide *enough* support for the conclusion (**fallacies of weak induction).**

7. Remember that inductively cogent arguments are sensitive to new evidence, while deductively sound arguments are not. This matters since it means that the beliefs we establish based on induction (which is most of our beliefs!) will need to be continually reassessed as we learn more about the world.

[Brendan: This is basically a short review of everything we've done so far. Are there any concepts here that still seem confusing or unclear?]

3.2 IDENTIFYING FALLACIES IN ORDINARY LANGUAGE

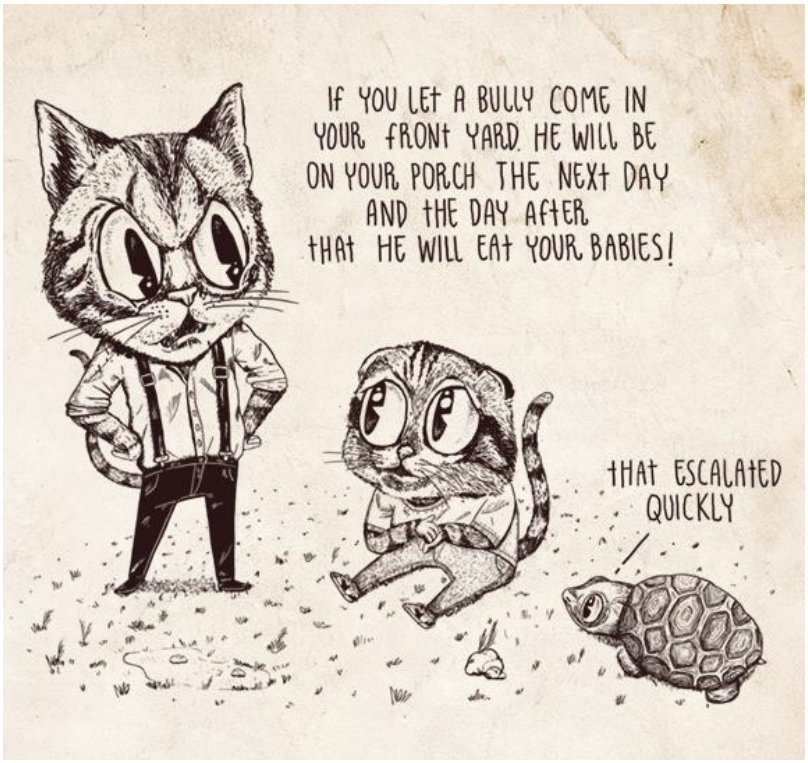

Figure 5 A Slippery Slope. From the Book of Bad Arguments.

In logic textbooks (and lecture notes), fallacies tend to stick out like a sore thumb: they are such *obviously* bad arguments that it seems impossible that anyone could possibly reason in such a way. And to some extent, this is true: in real-life speech and writing, people are generally smart enough to avoid making such simplistic mistakes. However, we commit slightly more complex versions of these fallacies every day. Why? A few reasons are as follows:

- **Sometimes, we convince ourselves it is OK to make bad arguments since it serves our goals.** In many cases, people *know* they are making bad arguments, and that it isn't really a good idea for anyone to believe their conclusion, at least based on the evidence they've provided. However, they might have ulterior motives (selling you something, getting you to vote for a certain candidate, etc.) that mean they benefit from this. This is a moral issue, since the purpose is to trick people into acting against their long-term self-interest. In any case, it's always good

to be on your guard for fallacious reasoning when talking to someone who has an obvious interest in getting you to believe a specific conclusion.

- **Sometimes, we let our emotions get the best of us.** Arguments often involve our emotions in some way: we have positive feelings about some people and causes, and negative feelings about other people and causes. These emotions can, in many cases, be a good thing since they motivate us to do things on behalf of others. However, they can also lead us to make mistakes when reasoning. In particular, it's important not to mistake the *feeling* "I really like this person! Their conclusion must be true" for the reasoned *judgment* "The argument that the person just gave was a good one." Similarly, don't mistake feelings of anger/disgust for actually having a reasoned critique of an argument whose conclusion you disagree with.
- **Sometimes, we just find it difficult to accept conclusions that don't fit with our worldviews.** We all have our own "worldview," or set of beliefs/values that define how we see the world and our place in it. Certain beliefs (such as those regarding religion or politics) occupy a much more central place in this worldview than others (beliefs regarding whether it will rain tomorrow). When we encounter arguments that *challenge* beliefs central to our worldview, there can be an almost overwhelming urge to dismiss the argument as quickly as possible and to stop thinking about it. This can easily lead to fallacious reasoning.

It is almost impossible to avoid these sorts of things completely. However, the study of fallacies should, ideally, make us better at recognizing when our reasoning has gone off track and start taking steps to correct it.

[Question: In what sorts of situations are YOU most prone to engage in fallacious reasoning?]

3.3 Some Arguments that Don't Work (Recognizing Common Fallacies)

OK, so we are done with our review of logic and fallacies. Now, let's think about how all of this might work when applied to a real-life topic of interest to many people: God's existence (or non-existence). To begin with, let's consider some arguments that are commonly recognized (by both theists and atheists) as being unsuccessful, even though it's pretty understandable why so many people accept them (most of them rely on well-studied psychological mechanisms):

Premises	Conclusion	Argument Type	Comments
Many people (maybe even you) have had "religious experiences." God's existence is one explanation for these experiences.	God exists.	Inductive-Weak.	The existence of a supernatural being is not the *best* explanation for these experiences, which we know differ wildly according to a person's culture and upbringing. This looks like an inappropriate appeal to **Anecdotal Evidence**. The best explanation would appeal to psychology, neurology, sociology, etc.
The Bible/Koran/Torah says that God exists. (Or, Karl Marx says that God does not exist.)	God (does not) exists.	Inductive-Weak.	Why should someone who doesn't *already* believe in God believe that the Bible, Koran, or Torah are true? This is an **Appeal to Inappropriate Authority.** In arguments, you should always appeal to

			authorities whose expertise would be accepted by someone who might be tempted to *disagree* with your conclusion.
Either God exists, or there is no meaning to my life. But there is meaning to my life.	God exists.	Deductive-Valid. (Unsound)	This is valid but unsound. The premise "Either God exists or there is no meaning to life" is probably false, since plenty of atheists/agnostics live meaningful lives. This is known as a **False Dichotomy** since it leaves out relevant possibilities. This might also commit the fallacy of **Begging the Question,** which occurs when one of your premises (whether or not *you* think it is true) is likely to be unacceptable to anyone who does not already agree with the conclusion.
I am afraid of hell. I want to go to heaven. (Or, I want to enjoy life and not have to worry about the afterlife.)	God (does not) exists.	Inductive-Weak.	*Wanting* something to be true, or *fearing* what will happen if you don't believe something are not evidentially relevant, even though they are psychologically relevant. Believing something because you are afraid of the consequences of not believing is related to the **Appeal to Force,** which happens when someone threatens you to make you agree with them.
I will be loved, accepted, and admired by society/my family/some other group if I believe that God (does not) exist.	God (does not) exists.	Inductive-Weak.	This is a version of the **Appeal to the People** fallacy. Wanting to be accepted by a group certainly provides psychological reasons to believe something but doesn't provide any actual *evidence*.
You can't deductively prove to me that God does not (or does) exist.	God (does not) exists.	Inductive-Weak.	Just because someone can't deductively prove that something is false does NOT mean that it is reasonable for you to believe that thing. For example, I can't deductively prove to you that jumping off a 30-story building will kill you, but it wouldn't be reasonable for you to do this. This is called an **Appeal to Ignorance.**
My life is great! Great things have happened to me! (My life sucks! Horrible things have happened to me!)	God (does not) exist.	Inductive-Weak.	This is a **Hasty Generalization.** You shouldn't overestimate the importance of your own (limited) experience. Instead, look at *everyone's* experience. For example, how does the world look to a child dying of malaria? To a happily married newly-wed?

As noted above, most of these arguments commit **fallacies**, which are arguments that have something wrong with them *besides* merely having false premises. Fallacies are very easy to fall into if you are not careful. As humans, we are very prone to believe the sorts of things that the people around us believe, that make us feel good, and that allow us to avoid wasting too much energy worrying about things that don't *directly* affect us. The bad thing about believing fallacies? They allow bad ideas to stick around for way longer than they should

(for example, the theory that the earth was the center of the universe, slavery, the belief that women are inferior, etc.).

[Brendan: Have you ever encountered versions of the above arguments?]

3.4 SOME BETTER ARGUMENTS

In the previous section, we discussed arguments that are (almost) universally recognized as bad arguments by logicians. We'll now move to some better arguments. Many of these arguments have long histories, and some very smart people have been on both sides of the debate. (Since both sides can't be right, we know that at least some of the arguments have false conclusions!)

Premises	Conclusion	Argument Type	Comments
I have an idea of the most perfect being, which I'll call "God". It is more perfect to really exist than to merely be an idea.	God exists.	Deductive (Invalid, at least in this form)	This is the **Ontological Argument.** Here's a **counterexample** that shows this particular version of the argument to be invalid: "I have an idea of the most perfect island, which I'll call `Atlantis'. It is more perfect to exist than to merely be an idea. So, Atlantis exists." More recent (and very technical) versions of this argument avoid this easy rebuttal.
The universe is a great fit for intelligent life. The best explanation for this is that God created a "fine-tuned" universe with intelligent life in mind.	God exists.	Inductive-Strong. (Arg. to the Best Explanation)	This is the **Teleological Argument** (or **Argument from Design).** Premise 2 may be false for the following reason: if life *weren't* a good fit for life, we wouldn't be around to observe it. Because of this, it looks like atheism provides an *equally good* explanation. Premise 1 may also be false, since we can seemingly describe universes that would be a *better* fit for life.
All physical events are events with causes. Some physical events (e.g., the "Big Bang") are not events with physical causes. So, some events with causes are not events with physical causes.	A non-physical "First Cause" exists.	Deductive-Valid. (Categorical Syllogism)	This is the **Cosmological Argument.** This does NOT claim to show that the Judeo-Christian-Islamic God exists, only that there is some non-physical cause of the universe. Some physicists have suggested that not all physical events have causes, or that all physical events DO have physical causes (even the Big Bang).
There is objective moral truth. If God does not exist, there is no objective moral truth.	God exists.	Deductive-Valid. (Modus Tollens)	This is the **Moral Argument for God.** Some atheists have claimed that there is no objective moral truth; others have claimed that objective moral truth does not require God.
Objective moral truth exists. If there is objective moral truth, then it is logically impossible for murder to be morally OK. If God exists, then God	God does not exist.	Deductive-Valid.	This is the **Moral Argument Against God.** Some theists have claimed that murder could be morally OK if God wanted it to be. Others have claimed that morality is *independent* of God (so, even God couldn't make murder morally OK).

could make murder morally OK. So, God does not exist.			
Innocent children and animals die horrible deaths from disease, natural disasters, and human action. We have no evidence that these things are for the "greater good". The best explanation for this is that God does not exist.	God does not exist.	Inductive-Strong. (Arg. to the Best Explanation)	This is the **Problem of Evil.** Some theists have argued that God's existence is an *equally good* explanation for the existence of evil. For example, perhaps suffering is necessary for free will or the existence of love. This requires more than showing that God *might* have some "unknown reason" for allowing evil, though—it needs to be shown that evil would be *just as likely* as on atheism

As you can see, most of these arguments above (unlike the ones considered in the first section) are either deductively valid or inductively strong. This means that, if you disagree with the conclusion of one of these arguments, you need to do the following:

- If the argument is deductively valid, you MUST provide evidence that at least one of the premises is false.
- If the argument is inductively strong, you can either (1) provide evidence that at least one of the premises is false, or (2) show that there is additional, relevant evidence that makes it likely the conclusion is false.

So, Should We All Be Agnostics? When confronted with arguments for conflicting conclusions, its tempting to think, "Well, who knows?" or "I guess everyone's opinion is equally valid." In some cases, this sort of "agnosticism" is perfectly fine. In many other cases, however, this is NOT a good response, and it has often been used to bad ends (for example, cigarette companies used this basic human response to try and create "doubt" about the cigarette-cancer link for years). Instead, one has to consider ALL of the relevant evidence, and try to decide which conclusion seems MORE LIKELY in the light of it. Remember, one good argument is better than ten (or a 100!) bad arguments. The takeaway: reasoning well is sometimes *tough,* but it really is worth doing (whether you are a theist, atheist, or agnostic).

[Brendan: Which of the above arguments seem the strongest/most interesting to you? Why?]

3.5 Review Questions

1. Take a few minutes and write down the *best* arguments you can think of for or against God. Now:
    a. Classify these arguments as inductive or deductive, and explain your reasoning.
    b. Carefully consider the premises of these arguments. Which of these premises might someone who disagreed with the conclusion object to? What sort of argument might they give?
    c. At the end of the day, how confident are you that these arguments could convince an intelligent, well-informed person on "the other side"?
2. Choose a topic that you are something of an expert on. (This could be anything! Sports, science, history, video games, etc.). Now, try to do the following:
    a. Come up with at least TWO sample arguments about this topic that commit the sorts of fallacies identified above (or which we have talked about earlier in the class).

b. Give an example of at least TWO sample arguments about this topic that do NOT commit fallacies. If possible, try to think of a specific debate with good reasons on both sides, and present an argument for/against the same conclusion.

4 READING: THE WRONG THINKING IN CONSPIRACY THEORIES

[Note: This is a chapter about failures of inductive reasoning I wrote for Richard Green and Rachel Robison-Green (eds)., 2019, Conspiracy Theories and Philosophy (Chicago: Open Court): 193-203. It focuses on how we humans fall for "conspiracy theories" even when we ought to know better. As you read, I'd encourage you to chime in with examples of conspiracy theories you've encountered!]

> *"In our reasonings concerning matter of fact, there are all imaginable degrees of assurance, from the highest certainty to the lowest species of moral evidence. A wise man, therefore, proportions his belief to the evidence."—David Hume*[2]

> *"The confidence that individuals have in their beliefs depends mostly on the quality of the story they can tell about what they see, even if they see little."—Daniel Kahneman*[3]

As the essays in this volume make clear, conspiracy theories vary widely in their content, the individuals and groups who believe in them, and in their effects on the behavior of these believers. For this reason, it may be difficult or impossible to come up with a completely general definition of *conspiracy theory* that captures all and only those theories that fit under this general label. Nevertheless, there are a significant number of conspiracy theories that share something like the following form:

> *There exists a certain small group of people that share a certain characteristic such as race, religion, occupation, or nationality. They have secretly undertaken actions that have harmed, or are intended to harm, me and people like me. The fact that these actions have not generally been recognized is due to the conspirators' ability to conceal evidence of this.*

Within the general scheme, there is plenty of room for variation. For example, the conspirators may be anonymous figures living otherwise unremarkable lives, or they may be well-known and powerful political, religious, or media elites. Similarly, some purported conspirators actively wish harm upon the believer and others—such as conspiracies positing "traitors" or "spies" working to ensure their own country loses some conflict—while others are held to have much more mundane motives, such as the desire for money or power. In this latter case, the harm in question may simply be an especially unpleasant side effect, though one that was foreseen by the conspirators. Finally, the harms attributed to the conspirators' actions come in a number of forms. So, for example, it may be that the actions of the conspirators have led (or will lead) to the deaths of particular individuals, financial crises or crashes, military defeats, outbreaks of disease or illness, the overthrowal of the government, and so on.

Conspiracy theories of this type all crucially involve failures of what philosophers often call *inductive reasoning*, which involves using our available evidence to determine what is probable or likely to be true. Inductive reasoning is usually contrasted with *deductive reasoning,* which involves attempts to *prove* with 100% certainty that a conclusion follows. As it turns out, inductive reasoning makes up a huge part of our day-to-day lives.

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[2] David Hume, *An Enquiry Concerning Human Understanding*, ed. Eric Steinberg, 2nd ed. (Indianapolis: Hackett Publishing, 2011), sec. 10.

[3] Daniel Kahneman, *Thinking, Fast and Slow* (New York: Farrar, Straus and Giroux, 2011), 88.

We reason inductively, for example, when we try to determine what was the *cause* of some event that we just observed, or when we try to figure out what the *effects* of this same event might be. We also reason inductively any time we make predictions about the future, or decide whether to trust what we've read or heard, or make generalizations about a large population based on the smaller sample that we are familiar with.

For this reason, conspiracy theories, and the errors of inductive reasoning that they exemplify, should be of interest to all of us. After all, if it turns out that many of the crucial errors committed by conspiracy theorists are ones that we ourselves are prone to, this will provide a strong reason for thinking hard about our own beliefs, and the process by which we have arrived at them.

[Question: Can you give an example of a current "conspiracy theory" that you're familiar with?]

4.1 DON'T BELIEVE EVERYTHING YOU'RE TOLD: HUME ON MIRACLES

Conspiracy theories often serve as simple, attractive rivals to other, more complex theories about politics, history, or science. So, for example, where political scientists may offer theories that tie the outcome of a particular election to factors such as economic conditions, demographic shifts, incumbency bias, and the relative appeal of the candidates' platforms and personae, conspiracy theorists often see the hidden hand of conspirators as being responsible for unwelcome outcomes. Similarly, where mainstream medical and scientific research suggests that conditions such as autism, drug addiction, or obesity have complex causal backgrounds, conspiracy theorists might reply that these bad things are actually due to the hidden side effects of vaccines, the clandestine activities of the CIA, or the machinations of "Big Ag."

One way in which conspiracy theories are distinguished from their mainstream rivals is their method of origin and spread, which is often outside traditional scientific and academic channels. In the modern era, for example, conspiracy theories often begin in the so-called "dark corners" of the internet, as opposed to in peer-reviewed journal articles. They then spread, via both alternative media sources and social media, to larger and larger audiences. To what extent should this sort of difference in origin matter to the credibility of the theories in question?

The Scottish philosopher David Hume (1711-76) takes up a very similar question in the "Of Miracles" section of his *Enquiry Concerning Human Understanding*. Hume was among the first to clearly distinguish between inductive and deductive reasoning, and his account of the problems inherent in inductive reasoning has influenced (and often troubled) scholars studying inductive reasoning ever since. In "Of Miracles", Hume considers whether or not one should ever believe peoples' accounts of miracles. His answer is a resounding "No!", and many of the reasons he provides are applicable to conspiracy theories as well.

Hume recognizes that the reasons people believe in miracles—because they hear or read about them from sources that they normally trust—are based in the same sort of inductive inference that underpins many of the things we believe. For example, nearly all of our beliefs about history, scientific theories, current events, and even the lives of our closest friends and family are, of necessity, based on what textbooks, teachers, newspapers, and other people tell us about these things. Because of the probabilistic nature of inductive inference, this means that is always *possible* that these sources are incorrect. However, we don't normally take this possibility as grounds for dismissing everything we hear or read. So, what makes reports of miracles (or conspiracy theories) any different?

Hume provides a number of considerations for treating reports of miracles differently than other sorts of "testimony," many of which are applicable to conspiracy theories. First, the chain of testimony supporting miracles often looks quite different than that of ordinary events. Miracles are almost universally said to have occurred long ago and/or in places far away, and under conditions that would have made it difficult or impossible for any skeptic to check on the truth of the claim. In conspiracy theories, by comparison, it is

often held that the conspiracy theory is happening "right now!" or "under our noses!". However, just as in the miracle case, it is a central part of the theory that there can be no possible recording/confirmation of the conspiration, since the conspirators have prevented this (perhaps by murdering witnesses or manipulating the media). The fact that reports of miracles and conspiracy theories haven't been and can't be, checked out by skeptical listeners doesn't mean that they are necessarily false, of course. What it does mean, however, is that these reports lack the sort of safeguard that comes with most testimony regarding strange or unlikely events—that is, if they *were* false, we would likely have some evidence of this.

A second key difference Hume notes relates to the *motivations* of those who talk about miracles. After all, one reason that miracles matter so much is that they can serve as evidence for the truth of certain religious views. This provides a strong motivation for people who already hold these religious views to believe in such reports (after all, we all like being shown right!), and it *also* provides motivation for them to spread these tales, even if they don't fully believe in them. After all, telling tales of miracles might win converts for the faith, or signal to other members of the group your "loyalty to the cause." Something quite similar can be said of many conspiracy theories—insofar as belief in these theories is closely linked to membership in some group, we have good reason to doubt the impartiality of those telling tales of conspiracies. Finally, Hume observes that, while one might think that the sheer strangeness and outlandishness of miracles would make people less likely to believe and repeat them, experience shows that something the opposite often seems to be the case—people seem to *enjoy* believing and repeating stories about events that are utterly unlike things they have experienced themselves. This, again, has close analogues with conspiracy theories. Odd as it may seem, the very claims of a conspiracy theory that seem the furthest detached from evidence and ordinary experience may be the claims that encourage its spread.

[Brendan: Do you have any friends/family that have tried to convince of the truth of "conspiracy theories"? What do you think attracted them to these theories?]

4.2 MAKING MISTAKES: HEURISTICS AND BIASES

In the generations since Hume first wrote, scholars in disciplines ranging from philosophy to economics to statistics to psychology have studied the nature of inductive reasoning from a variety of perspectives. While many of these investigations have aimed at uncovering better methods for inductive reasoning, others have aimed at figuring out how good ordinary humans are at inductive reasoning in a variety of contexts. Most of us do well enough when the conclusions of inductive reasoning concern our immediate experience, for example—we learn quickly to avoid hot stoves, or to avoid drinking bottles labeled "poison," but it is much less clear how successful we are when it comes to dealing with big-picture issues regarding statistical or causal reasoning in areas such as economics, science, or politics. These, of course, are precisely the areas where conspiracy theorists are most prone to get things wrong. So, why might this be? And just how common are these errors?

Starting in the late 1960s, two Israeli psychologists—Amos Tversky and Daniel Kahneman--began investigating just these sorts of questions. In a series of influential articles[4], they argued that humans are not intuitively "good statisticians," and they make a number of *systematic* mistakes when engaging in inductive reasoning. Tversky and Kahneman's research has had an impact far behind psychology, and in particular caused considerable problems for the view (once common in both economics and some areas of philosophy) that humans generally acted *rationally*.[5] While Kahneman and Tversky don't explicitly consider the problem of

[4]See especially "Judgment under Uncertainty: Heuristics and Biases," *Science* 185, no. 4157 (1974): 1124–31; "Prospect Theory: An Analysis of Decision under Risk," *Econometrica* 47, no. 2 (1979): 263–92. A good summary of both their work and related research is provided in Kahneman's *Thinking, Fast and Slow* (2011).

[5] In 2002, Kahneman won the Nobel Prize in Economics for this work. Unfortunately, Tversky died in 1996.

belief in conspiracy theories, their work provides a helpful framework for identifying and classifying many of the major inductive mistakes that conspiracy theorists make.

A foundational concept of Kahneman and Tversky's approach is that we make many decisions using intuitive *heuristics,* or simple rules for making inductive decisions. In particular, they suggest that, when we are faced with making a complex decision, we often (without realizing it) "substitute" a simpler, easier-to-answer question, and answer that instead. And while this may work well enough in many day-to-day cases, it can also easily lead to fallacious reasoning of the sort exemplified in conspiracy theories.

4.3 THE STORY JUST "FITS": THE REPRESENTATIVENESS HEURISTIC

Conspiracy theories often begin with the intuition that some bad event—a recession, an outbreak of a disease in the local community, or a school shooting—cannot be adequately explained by any combination of normal causal processes discussed by scientists, public health officials, or psychologists and sociologists. They then conclude that this event must have been caused by a carefully planned process (instigated in secret by the conspirators!) that was designed to result in just this sort of outcome. This way of reasoning exemplifies what Kahneman and Tversky label the ***representativeness heuristic,*** in which the probability of a certain process P causing event E is judged solely by the "resemblance" between P and E and NOT by any careful consideration of how probable it was that P actually occurred, or the potential alternatives to P, or even how good of evidence for P we happen to have.

In the case of conspiracy theories, the representativeness heuristic might explain several inductive failures. First, it accounts for the way conspiracy theorists often seem to ignore the comparative *base rates* of "bad things caused by a combination of ordinary factors" versus "bad things caused by powerful secret organizations working in secret to cause just this sort of harm in each and every gory detail." While the resemblance heuristic pushes us toward the conspiracy story (since it better "resembles" the bad thing in question), this is a bad inference. After all, the vast, vast majority of the harms that we in incur in life are NOT the result of explicit conspiracies intended to cause this exact outcome, but instead are the result of perfectly mundane causal factors acting in combination (that is, plain old "bad luck").

For similar reasons, the representativeness heuristic can plausibly account for conspiracy theorist's tendency to posit highly specific causes for events that are better explained by appeal to statistics. So, for example, small samples are more variable than large samples, and so we should be very careful in drawing conclusions based on what we have observed in small samples, even if the sample in question seems odd to us. So, for example, if two people in a small office of ten people each have a heart attack during the same month, this might seem unusual, but it doesn't provide strong evidence the office coffee has secretly been poisoned by management seeking to save money on future pensions. By contrast, if 200 people in an office of 1,000 people suffer such attacks in a month (the same percent, but a much larger sample), this really does suggest something out of the ordinary is going on. However, in practice, conspiracy theorists (along with the rest of us) systematically overlook this difference in sample size, and too often jump to conclusions on the basis of small samples.

For similar reasons, the confidence we have in our conclusions about the causes of events ought to reflect the strength and variety of evidence that we have seen—after all, it is surely better to read ten high-quality journal articles and one moderately plausible social media post about a conspiracy theory than just the moderately plausible blog post. However, the representativeness heuristic (which ignores quantity or quality of evidence and cares *only* about its "fit" with a theory) can lead us to ignore this and, in some cases, to feel *more* confident in our conspiracy theory after reading just the social media post, since there are no additional sources to interfere with the nice clean fit between this story and our believing in the truth of the theory it

describes. Basically, once we decide to give the social media post any credence whatsoever—as opposed to simply dismissing it out of hand—it can be very difficult to not *overweight* its value as evidence.

[Question: Try explaining the "representativeness heuristic" in your own words. Now, give an example of it.]

4.4 PROBLEMS WITH PROBABILITIES: PROSPECT THEORY

The decision to adopt a conspiracy theory can be thought of as a sort of "bet" about the way the world will turn out, and what the "winning strategy" for living in such a world will be. So, for example, if I suspect there is a good chance that the members of the US Federal Reserve Board are an evil cabal intent on crashing the world economy to enhance the wealth of their corporate masters, I might buy gold and bury it in my back yard to hedge against this. If I assign a significant probability that pharmaceutical companies have hidden the evidence of vaccines causing autism, I might not vaccinate my children. Finally, if I believe it likely that some suspect group of people is up to no good, I might take action against them, potentially including violence.

Most of us would like to think that we are good at making such bets, since they are crucial to making decisions about how we invest our money, vote, and generally lead our lives. So, for example, it seems obvious that a 1% risk of a bad outcome is different than a 5% chance, which is in turn different from a 50% chance or 95% chance, and our choices and actions should reflect this difference. Unfortunately, according to the **prospect theory** proposed by Kahneman and Tversky, this is not how we humans actually make these sorts of decisions. Instead, we get things wrong in a number of ways.

First, we tend to focus not on the relative merits of a set of outcomes, but on how we think of ourselves as having arrived at these outcomes, and whether we view them as "gains" or "losses" from a psychological baseline. As it turns out, we care much more about potential losses than we do about potential gains, and simultaneously don't care as much about the relative size of these gains or losses as we should. Conspiracy theorists offer excellent examples of this. First, in cases where they weigh large potential benefits from a change versus (much smaller) potential losses, they can be highly risk averse, for example when they reject the large potential benefits of vaccines or GMO foods on the grounds that there might be hidden health risks associated with these. Second, in cases where the conspiracy theorists already feel that they are below some psychological baseline, they can instead become *risk-seeking,* and adopt conspiracy theories that lead to highly risky actions in a last-ditch attempt to put themselves back over the baseline, even though the most probable outcome of such behavior would be to put them even further under this baseline than they already feel themselves to be. So, for example, if the members of a certain group worry they are "losing control of their country" to their political rivals, they might respond by abandoning democratic norms or engaging in violence, even though these actions are, on balance, likely to lead to even greater losses.

Prospect theory also suggests that we systematically underweight the probabilities of some events while overweighting others. In particular, while we sometimes tend to treat extremely unlikely but possible events as being equal to 0, we quickly *inflate* the probabilities of unlikely events once we begin to treat them as being genuinely possible, no matter how "objectively" unlikely they might be. In the case of conspiracy theories, this might plausibly explain the simultaneous urge to (1) dismiss out-of-hand the possibility that the harms that have occurred to them are due to statistical "chance", and (2) vastly inflate the probability that these harms are caused by the secret actions of conspirators.

[Brendan: Can you give an example of a bad event that is highly unlikely to happen, but is still possible? What is the "rational" way of dealing with this possibility? How much time/effort should we devote toward preparing for it?]

4.5 CAN WE AVOID MISTAKES WHEN IT COUNTS?

So, what's the takeaway from all of this? It might be summarized as follows: conspiracy theorists, like the rest of us, notice bad things happening in the world around them. They (again, like the rest of us) are convinced that there must be a cause for these events. However, when they begin to consider what sort of cause this might be, they are led astray by the resemblance heuristic, which predisposes them towards a causal story (the conspiracy theory) that most closely "resembles" the limited samples they are familiar with, and the limited, biased evidence they have reviewed. This completely ignores the possibility that the events in question are simply the result of statistical "chance." These errors are compounded by the failure to deal with probabilities and "risky decisions" properly, as described by prospect theory. Conspiracy theorists are often attached to some (perhaps imaginary) baseline about the way things "used to be" or the way "nature intended things," and are willing to take risks to avoid accepting losses from this baseline. Simultaneously, they improperly dismiss the possibility of some unlikely events (such as the sorts of chancy processes that *often* explain strange-looking results in small samples) and the inflate the probability of others (such as the conspiracy theory they've heard so much about on talk radio).

In *Thinking, Fast and Slow*, Kahneman argues there are other heuristics and biases waiting to trip us up, beyond those described here. The ***halo effect,*** for example, predisposes us to (without any evidence!) assign good qualities to people/things we *already* believe are good in other respects, and bad qualities to those we already dislike or distrust. ***Outcome bias,*** meanwhile, presents us with a false view of the past, whereby we assume that the things that did happen (for good or bad) were *predictable.* This conveniently allows us to avoid giving credit to decision makers for decisions that turned out well while blaming them for decisions that went wrong. These sorts of processes plausibly lend fuel to the fire of conspiracy theorists' tendency to blame any and all bad outcomes on the actions of the purported conspirators (who, not coincidentally, tend to belong to groups the theory's proponents already hold in ill regard). Finally, and perhaps most concerning our intuitive sense of how likely a given outcome is strongly affected by the detail in which one have imagined or described this outcome. So, the mere act of talking or reading about a conspiracy theory in detail might well serve to inflate our sense of how probable this sort of really thing is.

All of this happens generally happens without even thinking, and it can happen to even smart, knowledgeable people, since inductive fallacies don't present themselves as defective means of reasoning. Instead, these processes present themselves as a strong feeling that certain theories or ideas are correct, and invite us to adopt and defend these ideas as our own with all of the intellectual creativity and rigor that we can muster. This suggests that that vulnerability to conspiracy theories may be linked to neither ignorance nor stupidity. Rather, it might be that conspiracy theorists are mentally "lazy" in the ways that many of us are lazy, and it is this laziness that undercuts their ability to make cogent inductive inferences. In particular, belief in a conspiracy theory allows one to avoid all sorts of uncomfortable thoughts, such as fully grappling with the role of chance in events, or the poverty and bias of the news we consume, or the systematic ways in which our sense of what's possible misleads us about what is actually probable. Conspiracy theories reassure us that the bad guys really are all bad, and that, if we stop them next time, we can assure things will turn out well.

If correct, this suggests that there can be significant value in reflecting on the inductive failures of conspiracy theorists, even for those who feel quite confident that they themselves could never fall into the trap of believing in such a theory. Such confidence, as it turns out, may be a poor guide to one's actual vulnerability. However, it may be that we can partially inoculate ourselves against conspiracy theories by paying close attention to the *specific* ways in which they exemplify bad inductive reasoning. This, in turn, might make it at least somewhat easier to catch our own errors, and to become better, more careful inductive reasoners[6].

[6] I'd like to thank Todd Kukla for his helpful comments.

[Brendan: What is the right way of responding when somebody we know falls victim to a conspiracy theory?]