There are three types of lies – lies, damn lies, and statistics. (Benjamin Disraeli)

CHAPTER EIGHT

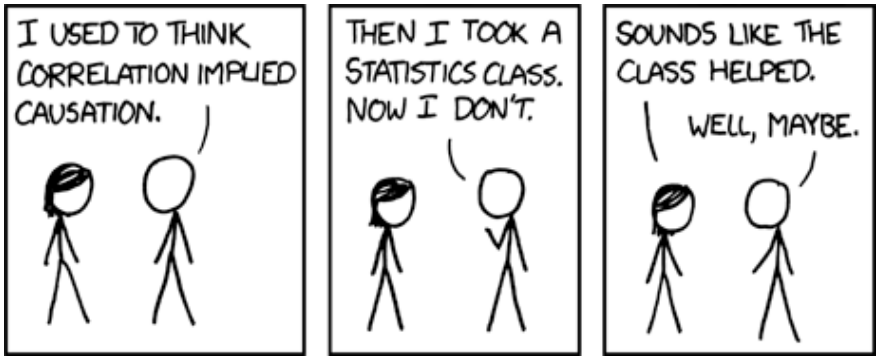
INDUCTIVE GENERALIZATIONS & ANALOGICAL ARGUMENTS

THE CONTENT AND PURPOSE OF CHAPTER EIGHT

Two More Ways to Reason Statistically (one that also works causally)

In the last chapter, we looked at our first kind of inductive argument: the statistical syllogism. It argues from *general* to *particular.* We saw that there are a number of fallacies that are related to it, and we discovered that most of these fallacies 'work' by abusing the rules of discourse. This chapter builds on this, by showing two more kinds of statistical induction: *inductive generalizations* and *analogical arguments*. These differ from the arguments from last chapter in that they *begin* with the particular. Some of these (the generalizations) will argue to the general (oddly enough), and some will stay basically on the same numerical level (the analogies).

Much like the last chapter, this one will first introduce the criteria of good arguments, explaining how they work and why, and then will delve into the murky world of fallacies by exploring those that specifically manipulate or flout the rules for these kinds of inferences.



FOUNDATIONS

Story Subtitle or summary

In this chapter, we'll continue our discussion of statistical reasoning, looking at those arguments that use samples or selections to derive general conclusions. We'll then turn to arguments that rely on comparisons, or analogies. Such arguments are a useful transition for us in that sometimes the relevance that makes the arguments work is statistical, and sometimes it's causal (the subject of our next chapter).

READING QUESTIONS

As you study this chapter, use these questions for critical thinking and analysis.

- What is the difference between a statistical syllogism and an inductive generalization? What do they have in common?
- What makes the *No True Scotsman* argument a fallacy? What is the basic error?
- What makes a sample representative of the whole? Write a careful paragraph explaining how you might create a representative sample in order to infer a strong conclusion about some group. Make sure you explain all *three* criteria of the rule of representation.
- Suppose you were asked to do a random sample of playing cards (Jokers removed), where you wanted to determine the diversity not of color, but of suits (clubs, diamonds, spades, hearts). What would be a good sample size? How did you determine this size to be representative?
- What is wrong with man-on-the-street sampling?
- How does the gambler's fallacy work? What's the error in judgment? Explain a time you or somebody you know made this mistake.

continued…

The following are some key ideas and concepts:

- Inductive generalizations are so common that they're sometimes mistakenly thought to be the *only* form of inductive reasoning.
- A universal generalization infers that 100% of the members of a class have a certain property. To infer this without adequate evidence, or to infer it necessarily if the evidence only suggests probability, is to commit a fallacy.
- An inductive generalization infers less than 100% of the members of a class have a certain property. Such an inference is based upon an observed sample.
- For an inductive generalization to be good the sample upon which it is based must accurately represent the whole: a sample accurately represents the whole if it is sufficiently large and diverse.
- To ensure a sample is sufficiently diverse, a representative sample must be made. Such can be done by random sampling or other careful means.
- A generalization can be made stronger by increasing the level of confidence in the conclusion. Such can be done by including a margin of error or lowering the probability of the conclusion.
- A series of events is random if its members are statistically independent of each other. It is a serious mistake to infer predictability of an event in that series from only the evidence of the highly improbable nature of that series.
- The more characteristics shared by the groups or individuals (analogues), the stronger an analogical argument is (the more likely the conclusion is to be true).
- The more relevant the compared traits (analogates) between analogues, the more likely the conclusion is to be true; but the more relevant any known disanalogies, the less likely the conclusion is to be true.
- The more diverse the relevant primary analogates (the compared traits) are in an analogical argument, the more likely the secondary analogate (the trait in the conclusion) is shared (that is, the more likely the conclusion is to be true).
- The more specific a conclusion is in an inductive argument, the less likely it is to be true.
- An analogy used to demean or belittle is unjustified: it breaks the rules of discourse and is practically *guaranteed* to be committing a fallacy. If you want a good argument, you'll avoid them, and if you're trying to think clearly, you'll disregard them.
- Analogical arguments are only good so far as they fail to have relevant disanalogies.
- When somebody claims there is a *slippery slope*, stop to determine whether there in fact is one. Sometimes there are arbitrary distinctions being made, but often, the distinctions are statistically, causally, or scientifically justifiable, and the accusation is intended to distract from, rather than lead to, the truth.

READING QUESTIONS, *continued.*

- What is the difference between the fallacies *hasty generalization* and *sweeping generalization*?
- Both the hasty generalization and the biased statistics fallacies break the rule of representation regarding samples. How are they different?
- What is the fallacy of misleading vividness? Can you give an example from your own experience when somebody made this logical error?
- What is the use of a margin of error in statistical generalization arguments?
- How do analogical arguments work?
- What is the difference between an analogue and an analogate?
- Briefly explain how to make a good analogical argument, following the rule of quantity and the rule of relevant analogates.
- What makes an analogate relevant?
- Why are disanalogies important when determining the strength of an analogical argument?
- Why is an inductive argument weakened by a specific conclusion?
- What makes for a false analogy fallacy?
- Go online and explore social media (especially Reddit and Facebook). Can you find three different *reductio ad Hitlerum* fallacies?

TASKS & CRITICAL QUESTIONS

This chapter contains ***six tasks*** (counting the second part of Task 45) and ***no critical questions***. Some tasks have multiple parts, spread out over multiple pages. There is ***extra credit*** worth up to ***one*** task assignment and ***one team project***.

GENERALIZATIONS

Statistical arguments infer conclusions in three directions:

- the statistical syllogism infers from *larger to smaller*,
- the inductive generalization from *smaller to larger*, and
- the analogical argument from *same to same*.

Another way to think of them is that statistical syllogisms argue from *general* to *particular*, generalizations argue from *particular* to *general* and analogical arguments argue from *particular to particular*. Generalizations and analogies both begin with specifics, which is why they're both discussed in this chapter.

The ***inductive generalization*** is also known as *simple induction* or *statistical generalization*. It is an argument from particular to general—that is, from smaller to larger. This is, in fact, such a common form of induction that it is sometimes mistaken to be the general description of *all* induction. (Of course, we have already seen that a powerful form of induction goes from general to particular, so we won't make that mistake.)

> *X is an* ***inductive generalization*** *iff x is an inductive argument that argues from the particular to the general.*

Contrast an inductive generalization with a ***universal generalization***. The latter concludes that *all*—100%—or *none*—0%—of class members have a certain property. An inductive generalization will conclude that some percentage less than 100 but greater than 0 of the class members will have that property.

By the way, there's an informal fallacy that relates to universal generalizations. Because of course there is.

Standard Form

The standard form of the inductive generalization (which I will now refer to as an **IG**) looks like this:

1. X% of observed Fs are Gs.

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2. X% of all Fs are Gs.

One can observe in a number of ways: scientific study, sociological research, data mining, etc.

No True Scotsman

Suppose one makes a universal generalization that, for example, "No Scotsman would do such a thing." Now suppose this generalization is met with a counterexample. The one who makes this claim might either acknowledge the new evidence and revise the conclusion or modify the subject of the conclusion to exclude the counterexample's legitimacy. In short, this is a use of rhetoric without reference to any logical rule, and it can be used endlessly to pare down possibilities until the conclusion is irrefutable, though meaningless.

This fallacy works by conjuring up stipulative definitions from thin air,* contrary to evidence. Here's a simple example of a ***No True Scotsman*** fallacy.

Person A: No Scotsman eats his porridge with sugar.

Person B: I'm Scottish, and I put sugar on my porridge.

Person A: No *true* Scotsman eats his porridge with sugar.

Philosopher Anthony Flew devised this name to refer to our tendency to stubbornly maintain our conclusions despite all evidence. This fallacy introduces us to the tricky world of generalizations, and it shows us that unless we have logical rules to govern our inferences, we can fall into pretty silly informal fallacies.

* Remember *stipulative definitions* from chapter 2.

To see how this argument might look in everyday situations, let's have a couple examples.

Example 1

1. Of the two thousand voters polled, twelve hundred (60%) said they'd vote for Jones.

2. 60% of the total vote will go to Jones.

Example 2

1. Most people I know speak English.

2. Most people speak English.

I bet you probably think there's something wrong with example 2. You're right: but what exactly *is* that problem?

It's not that there's no formal statistic. I could just as easily say

1. 93.2% of everyone I know speaks English.

2. 93.2% of all people speak English.

When it's put more precisely, it still seems absurd. Sure, we *know* that most people in the world don't speak English. But it fits the standard form! And since inductively strong arguments can have false conclusions, isn't it possible that this is still a strong argument? Or does it still just stink?

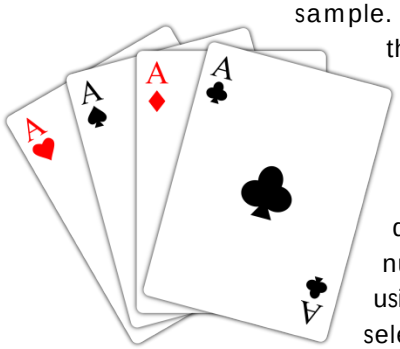
Face it, it stinks.

And what stinks about this argument is the inference. But what about it?

Making a Representative Sample

So how does one create a good sample? There are several methods, though none of them *guarantee* that a sample will be representative. Their use, however, ***increases the probability*** *of a sample's representativeness.*

The first method is called ***random sampling***. In this method, each member of the population has an equal chance of being chosen as a member of the sample. So if we want to know the probable outcome of a national election, we might construct a random sample of registered voters in a district by assigning a number to each one and using a lottery device to select members.



ENSURING YOU'VE GOT A STRONG INDUCTIVE GENERALIZATION

So how can we know whether IG arguments with true premises can lead to true conclusions? Well, it depends on whether the sample referred to in the premise is ***representative*** of the population referred to in the conclusion. Let's call this the ***Rule of Representation*** (or R-Rep, for short)

R-Rep: If the sample is representative of the population from which it was taken, then the conclusion based on the sample is strongly supported.

Sample X is ***representative*** *of population P iff the features of P that are relevant to the argument are correctly reflected in X.*

The problem in example 2, above, is that *my knowledge* of humanity is not an adequately representative sample of all of humanity.

How does one *correctly* represent a population? The following two criteria are the traditional standards, which work as the teeth of R-Rep. You might find them too vague at first consideration:

1. The sample must be sufficiently large.
2. The sample must be sufficiently diverse.

But when we unpack them, we can see exactly how powerful they are.

To determine whether a sample meets the two criteria requires some background information. If we have reason to believe that a population is highly uniform regarding the properties that interest us, then we can use a smaller sample to capture the diversity, whereas a highly diverse population requires a large sample to capture the diversity.

But a large sample in itself may not—probably won't—capture the diversity of a large population. For example, if one wanted to know the probable outcome of a national election, a survey of 100,000 voters might, on the face of it, seem helpful. But if that sample were composed entirely of white male business executives, the conclusions inferred from that sample would become immediately suspect (unless all you wanted to determine was how the general population of white male executives would vote).

To see how important it is to select a sample that is 'sufficiently large,' we can look at a population we already know everything about: a deck of playing cards (Jokers removed).

Now suppose we want to take a sample from the population of 52 cards that accurately reflects the diversity of the deck. And let's limit our concern to simply the *color* of the card—red (R) or black (B). We might say that since there are only two colors, we can draw a sample of only two cards. There are thus four possible outcomes of our draw:

(a) RB (b) BR (c) RR (d) BB

Notice that in our samples of card draws, we include every possible outcome. I might draw a red card and then a black card (a), or I might draw a black card and then a red card (b). Although the ultimate outcome is basically the same regarding the *color* of cards I have, these are two distinct outcomes because the *order* of the color drawn is different. (Remember Leibniz's Law!)

Only half of the time do we get an accurate representation of the deck, in trials (a) and (b). This sample size only has 50% accuracy, not at all strong enough for a decent inference. So let's double the size of our draw to include four selections (or trials). Now there are exponentially more possible outcomes:

(a)	RRRR	(b)	RBRR	(c)	BRRR	(d)	BBRR
(e)	RRRB	(f)	RBRB	(g)	BRRB	(h)	BBRB
(i)	RRBR	(j)	RBBR	(k)	BRBR	(l)	BBBR
(m)	RRBB	(n)	RBBB	(o)	BRBB	(p)	BBBB

Here we find that there are now *twelve* possible outcomes (remembering that these represent the cards drawn *and* the order in which they're drawn). We can see that there's still only *six* of the outcomes in which we have a sample that 100% represents the diversity of the deck (50% each color), so we can't adequately draw a *universal* generalization.

However, this increased sample size has given us only two possible outcomes where the sample draw is all of one color or the other. Notice this: only draws (a) and (p) gave us all of one color. All the others gave us two colors, showing us something of the deck's diversity of color. Thus, whereas the smaller sample gave us a probability of .5 (or 50%) that a conclusion drawn from it is an accurate representation of the deck's diversity,

The Gambler's Fallacy

Also sometimes called the *Monte Carlo* fallacy, this is that one fallacy that is *so* easy to fall into when determining statistical outcomes. Suppose you are gambling on fair dice or the flip of a fair coin. Suppose further you've had a run. Every time you toss the dice, you get a full house or five of a kind. Crazy! Every time you flip that coin, you get heads. What are the odds?!

In the Tom Stoppard play *Rosencrantz and Guildenstern are Dead*, the hapless lead characters attempt to determine probable outcomes by flipping a coin. Frighteningly (in the context of the play), every toss of the coin comes up heads. One hundred times in a row—heads. What are the odds of such a run? Well, actually, they're one in two to the hundredth power ($1/2^{100}$).

You keep getting five of a kind. What is the probability that the *next* roll will get you something other than five of a kind? You keep getting heads. What are the odds that the next toss will come up tails?

In the Monte Carlo casino in 1913, a roulette spin came up black a record *twenty-six* times in a row. At the table, at about the fifteenth black spin, a near-panic fever to bet on red emerged. People doubled and tripled their stakes on red. By the twentieth black, betters believed that there was only a one in a millionth chance that the next spin would be black. People bet higher and higher, and at the end of the run, the casino gained millions of francs from the fallacious reasoning of the gamblers.

What's the fallacy? It is to suppose there is ***statistical dependence*** where there is none. Here's a definition:

> *Two events X and Y are* ***statistically independent*** *iff the occurrence of x has no statistical effect on that of y (and vice versa).*

continued…

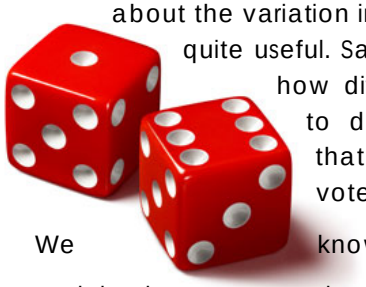
the larger sample gave us a probability of .875 (or 87.5%) that the deck is composed of two colors. Notice the conclusion here is *only* that the deck is composed of two colors, not that it is *evenly* divided into the two colors.

In general, as the sample size increases, the proportion of red cards and black cards in the sample more accurately represents the proportion in the deck's population.

If we wanted to draw a more specific conclusion (say, that the deck is exactly divided between colors), then we'd need a larger sample size.

So for Task 46, consider this problem. What would a sample size of *ten* cards look like? How many outcomes would give us between 40% and 60% red cards? What does this show us about the relevance of sample size? You will want to give yourself some time to do this task.

A special kind of random sampling is called ***stratified random sampling***. When we have some information about the variation in a population, this method is quite useful. Say we know something about how different populations are likely to differ regarding the property that interests us. Let's consider voter preference again.



We know that people of certain social class, occupation, ethnic background, and religious affiliation generally share voting preferences. Now say we *also* know the proportion of each of these groups in our voting population. Then, we can randomly sample within each group and weigh each sample with the others accordingly, constructing a total sample that best reflects the total population's proportions. And then the conclusion we draw from this stratified sample will reliably indicate voter preference by taking into account the variety in the total population.*

But what if we don't have adequate time or money to design usefully randomized samples? If we do not have the background information to tell whether a sample represents the population adequately regarding the property we are considering, then what?

The Gambler's Fallacy, *continued.*

A sequence of events is ***random*** if its members are statistically independent of each other. So the sequence of one hundred heads by Rosencrantz and Guildenstern was random. As was the sequence of black spins in 1913.

The gambler's fallacy is to suppose that the sequence is *not* statistically random. It is to suppose that statistically independent events are *not* statistically independent. Every single toss of the coin has a statistical probability of .5 (50%) of coming up tails—*no matter the outcome of every previous coin toss.* Every single spin of the wheel has the same probability of coming up red—no matter the outcome of very previous spin. And every roll of the dice is statistically independent of every previous roll of the dice. To think otherwise is to reason fallaciously.

Another way to think of this is that one commits the gambler's fallacy when s/he infers that an outcome is *predictable* when it is not. Oh, and by the way, every so-called "system" gamblers have for roulette, dice games, and slot machines is based on this fallacy. Yeah. So why do people think their systems work? Misleading vividness and biased statistics, baby. Sorry to burst your bubble, but statistics don't change on emotions or wishful thinking.

TRUTH, STRENGTH, AND THE ATTACK OF THE KILLER FALLACIES

It is really important not to confuse *true conclusions* with *strong arguments*. Remember that the badness or goodness of an inductive argument is *not* based on whether the conclusion is *actually* true, but on the *probability* of the conclusion being true, given the premises. If you don't have a good probability, it's likely you're entering into fallacy land.

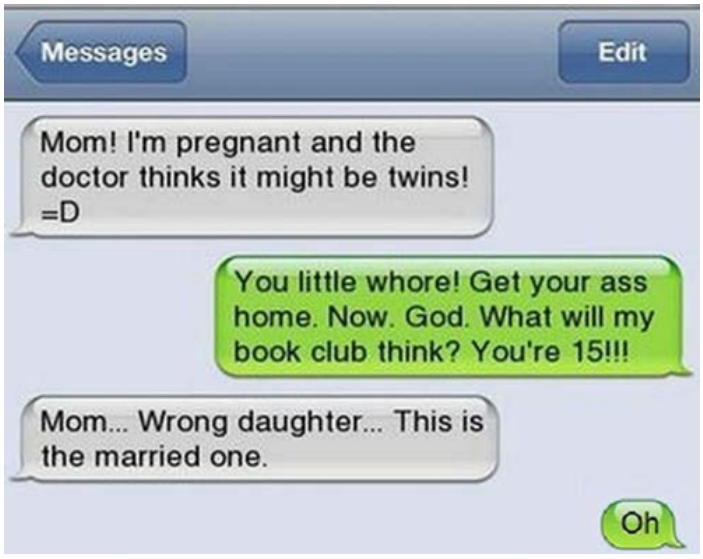
continued…

* This method is used by such statisticians as the Gallup Poll, for example.

If we cannot make a reasonable generalization, it is best simply to suspend judgment.* It isn't mandatory that we know everything about a given population to make a strong argument. It is mandatory that we be aware of the limitations of our knowledge and limit our conclusions accordingly.

What if, for example, you had a Task assignment due in three hours, and you just learned that you need to, for Task 47, construct a sample that you can use for an argument about how students at your college feel about the Affordable Care Act? You don't have access to all the students' ID numbers, nor do you have time to generate a sample from them, let alone to contact every student that your lottery would have selected. Suppose you decide your best bet is to do an *ad hoc* man-on-the-street interview, asking the first fifty students who will answer, and locating yourself by the computer lab's doorway for as long as it takes to interview this many students.

Here's your *real* Task 47. Suppose you really did take the path I just described. Why would this kind of sample be less likely to be representative than the two random methods? In a well-formed paragraph, discuss the problems with this method in generating strong arguments.



ATTACK OF THE KILLER FALLACIES,

continued.

Hasty Generalizations

Just like the statistical syllogism had a number of related fallacies, so too does the inductive generalization. The first fallacy is quite well known. It's known as the ***hasty generalization*** (also, as the *fallacy of insufficient statistics* or sometimes, a bit too loosely as *leaping to a conclusion*).

Notice how the IM conversation to the left is a *kind* of leap, and it relates to the hasty generalization, but the latter focuses rather on drawing a generalized conclusion from a specific sample. Hence, I will make a distinction between ***leaping to a conclusion*** and a hasty generalization, referring to the kind of fallacy illustrated in the IM conversation as the former.

The hasty generalization is in fact the fallacy Example 2—from way back at the start of this chapter—we could *feel* happening. Now we'll start to get some logical explanation of why that felt like bad reasoning. Here it is again:

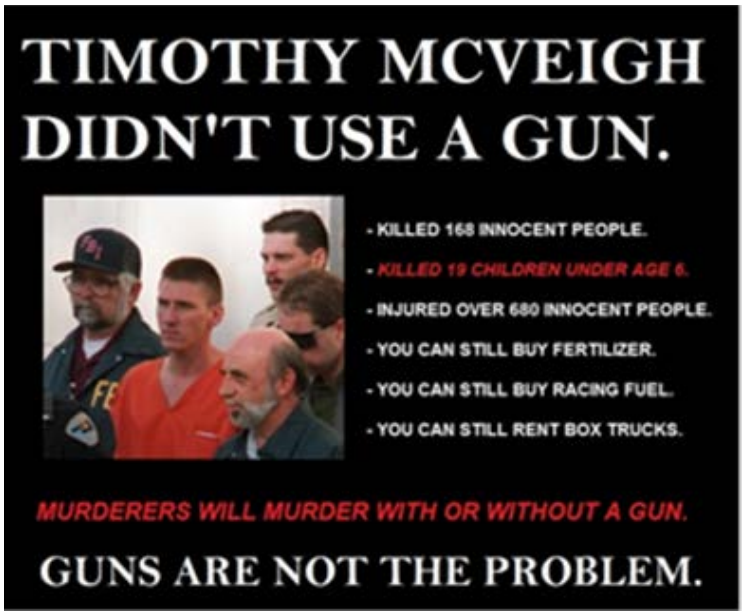
Example 2

1. Most people I know speak English.

2. Most people speak English.

continued…

* Do not confuse 'reasonable generalization' with 'absolutely certain generalization.' No one is ever absolutely certain about any inductive argument, but we live our lives by induction. Do not become so rigorous that you wind up making a universal generalization that the probability is zero regarding what can be known.



Sweeping Generalizations

A word on complaints about 'sweeping generalizations' like the intention behind this particular meme:

The complaint here is supposed to be hilarious because he's is making a generalization. Har har! How stupid!

Well, no, not really. We need here to understand what the fallacy ***sweeping generalization*** actually is. When you generalize over individuals who are relevantly different than the general statement, you're making a sweeping generalization. Notice its relation to the hasty generalization, which, for clarity, I'll now call the HG, calling the sweeping generalization the SG.

ATTACK OF THE KILLER FALLACIES,

continued.

Concluding from my tiny sample size (my limited experience) to the whole of humanity is, as we academic philosophy-types would characteristically understate, "a bit quick."

Consider, for Task 48, the graphic to the left of this. It represents the gun restrictions debate after the Sandy Hook shooting. In a well-formed paragraph, analyze the graphic and consider its context in the whole of American gun culture and the history of mass violence in the last 30 years. How does this meme make a hasty generalization? What relevant data does it leave out?

Not much more explanation needs to be offered about this fallacy, although the psychological reasons for making such a jump merit at least some mention: one might make a generalization to justify hurt or angry feelings, or because personal interests obscure the bigger picture. We might lack background information to make a dispassionate (unbiased) inferences, or to determine whether a sample is large or varied enough.

Biased Statistics

The second fallacy is the fallacy of ***biased statistics***. If a sample lacks proper variety, it is called a ***biased sample***. Biased samples fail to represent the variety of the population from which the sample was taken. It really has nothing to do with whether the one taking the sample is biased (though s/he might be), rather, on how the sample reflects the total population.

continued…

The HG breaks the R-Rep. The SG applies a generalization to specific cases that do not fit into either the sample or the population itself: an HG derives a generalization from a too-small sample; an SG applies a general statement too broadly.

Here's an example of a sweeping generalization:

1. (The rule of the day was that) Children should be seen and not heard.
2. Mozart, who at 4 was a prodigy, composing music and performing for the Austrian royalty, was clearly a child at this time.

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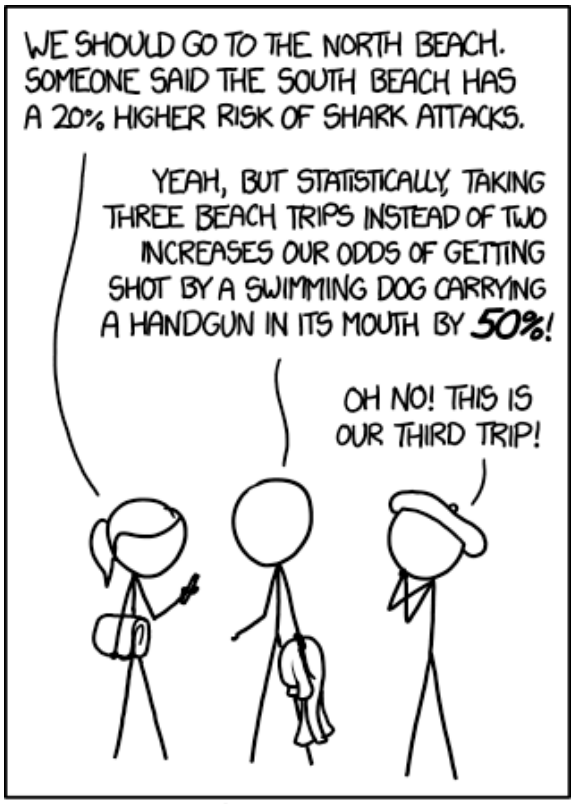
3. So 4-year-old Mozart should have been seen, and not heard, keeping his music to himself.

The generalization (in this case, a rule of thumb for social interaction), when applied to this particular case, is misplaced. The fallacy is in the application of a rule or category to an individual or group to which it does not apply.

So, the meme is correct insofar as it notes that sweeping generalizations are bad. But not every generalization is a sweeping one. Or a hasty one. And those that obey the rules of reasoning are perfectly fine and, in fact, powerful inferential tools.



ATTACK OF THE KILLER FALLACIES,

continued.

Consider an argument about the outcome of the national election.

1. 100,000 voters sampled said they would vote for Candidate X in the national election.

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2. So Candidate X will probably win the national election.

We have reason to believe that the sample is sufficiently large, but if the sample were composed entirely of white male business executives, then we'd know the sample was biased. Any argument built on a biased sample is a fallacy of biased statistics.

This, by the way, gives us a very helpful insight. Let's look at the two criteria that define our Rule of Representation (R-Rep), again:

1. The sample must be sufficiently large.
2. The sample must be sufficiently diverse.

When an argument fails to meet the first criterion, it commits a hasty generalization. When it fails to meet the second, it commits the fallacy of biased statistics.

Misleading Vividness

Suppose you were going to buy a new big-ticket item X. You have been careful to get all the evidence about different kinds of Xs out there, comparing thousands of makes, models, X dealerships, and took into account statistics about performance, safety, repair, longevity, resale value, and so on. Then one day, hanging out with your best friends, you mention your decision to buy a new Brand B model M X. (A BMX?) Horrified, one of your friends tells you that his sister had a BMX, which had so many problems it just wasn't funny. In fact, this particular X was *so* bad—here, let me just show you the pictures.

If you then decide *not* to buy the BMX on the word of your friend, you've committed a fallacy.

Why?

It's not that you added new information to your research and judged accordingly. Rather, if you did this, you discarded *all* of your previous research for this new, more *vivid* information. Data about thousands of cars was rejected for the story of one. To make such a rejection—*to allow a single vivid case to outweigh strong statistical data*—is to commit the fallacy of ***misleading vividness*.**

People who want to manipulate know the power of the well-placed anecdote. Concrete stories are far more emotionally influential than statistical reports, and this is why politicians who use data are less likely to win elections than those who tell one or two vivid stories. But we know that emotions are not a good indicator of truth, and when anecdotal evidence is allowed to overrule strong statistics that contradict it, atrocious reasoning has occurred. Unfortunately, this fallacy commonly characterizes politics, business, and interpersonal relations.

But now you know better.

REVISING INDUCTIVE GENERALIZATIONS FOR STRENGTH

We can improve IG arguments by adding a third criterion to the Rule of Representation. When determining the strength of an argument, we can either beef up the premises—making them better evidence for the conclusion—or we can water down the conclusion—making it small enough for the evidence we already have.

How do we weaken a conclusion in order to strengthen the whole argument?

Suppose you've got that hypothetical Task assignment I mentioned right before Task 47. But suppose you're not going to resort to the computer lab doorway interview, rather, decide to deliberately interview students all over campus, from obviously different age groups, ethnicities, educational backgrounds, programs, and majors. Suppose further, you even take time to visit all college campuses in in the region, taking care to interview people from each of them, taking care to get as much diversity in your interview sample as you can.

Say your argument looks something like this:

1. Of those interviewed, x% of students feel y about the Affordable Care Act.

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2. So, x% of all students feel y about the Affordable Care Act.

But you still know you don't have a proper random sample, since you've not adequately represented the full diversity of the student body by lottery of all of the population. And you know that you can't get a bigger sample. You don't have the time or resources. What you do have is the ability to include a ***margin of error***.

Statisticians have calculated margins of error associated with various sample sizes—determining how we can reach a ***level of confidence*** that our conclusion is correct. The math is complicated, and I won't expect you to do any of it here. What you do need to see is how margin of error, confidence level, and sample size are interrelated.

> *The higher the confidence level you desire (how certain you want to be that your conclusion is correct), the wider your margin of error should be.*

Of course, this higher confidence level comes with a price—your conclusion will be less precise. On the other hand, if you are willing to accept a lower confidence level (a greater chance of being wrong), then you can use a smaller margin of error for a comparable sample size.

We might state margin of error and confidence level informally, using words like *almost all* or *most* or *roughly* or *it's probable that* or other such terms. But we can state them numerically and often do. Regardless whether we state them numerically or

informally, when we allow for a margin of error, we make explicit a *third* criterion for the R-Rep:

3. The larger the margin of error in the conclusion, the stronger the argument.

Here's how the standard form of a revised inductive generalization argument looks, taking into account this third criterion of the R-Rep:

1. X% of observed Fs are Gs.

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2. X plus or minus z % of all Fs are Gs.

All of this in mind, then, here's the Rule of Representation (R-Rep), summarized:

R-Rep: *If the sample is representative of the population from which it was taken, then the conclusion based on the sample is strongly supported*.

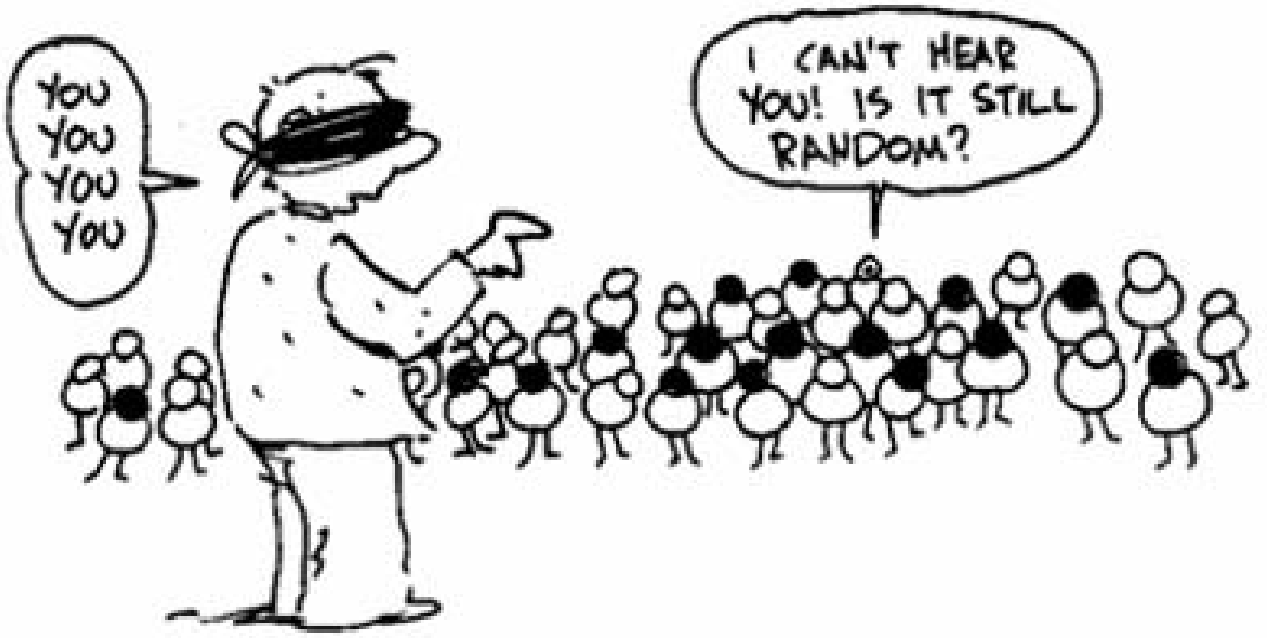
*Sample X is **representative** of population P iff the features of P that are relevant to the argument are correctly reflected in X.*

*Population P is **correctly represented** in X if X is sufficiently large and sufficiently diverse.*

*The larger the **margin of error** in a conclusion of an inductive generalization, the stronger the argument.*

For Task 49, look at the following arguments. Identify the premises and conclusion of each argument, and decide whether each is an acceptable generalization or a fallacy. If it's a fallacy, which kind? If you need additional background information, discuss what you would need.

1. A nationwide poll of a random sample of thousands of homeowners revealed that 70% of them are opposed to increases in welfare payments. Therefore, roughly 70% of the adult population opposes welfare increases.
2. An investigator studied several thousand heroin users and learned that 75% of them had used marijuana before they tried heroin. He concludes that roughly 75% of all marijuana users will go on to try heroin.
3. Jon has to drive to a distant city. He wants to take the safest mode of transportation, so he compares statistics over the past ten years involving busses, trains, automobiles and planes on routes between his city and the one he'll be visiting. He determines that a bus is safest in terms of lives lost. But as he's about to buy his ticket, he reads a news story about a bus accident in which six die. He decides to drive.
4. At U Penn, psychiatrists conducted a study to determine the social factors that affect the well-being of heart patients. Of the 93 patients in the study, slightly more than 50% had pets (dogs, cats, an iguana). At the end of a year, 1/3 of the patients who did not have pets died, but only 3 pet owners did. The psychiatrists concluded that pet ownership may have a positive effect on the health of humans.



ANALOGICAL ARGUMENTS

We all know what analogies are. They're comparisons, and thus it's clear that analogical arguments are arguments that compare things. And as promised, this is our third sort of induction. Remember that statistical syllogisms inferred from larger to smaller, and inductive generalizations from smaller to larger. Analogical arguments will infer from same to same, size-wise.

Standard Form

We'll just jump right into standard form in order to see the characteristics of an analogical argument:

1. Objects of type X have properties A, B, C, D.
2. Objects of type Y have properties A, B, C, D, and E.
3. There's no reason to infer X objects don't have E.

---

4. So objects of type X have property E.

The structure, like all inductive arguments, doesn't guarantee the argument's legitimacy. What matters is the meaning packed into those three premises. To show what these mean, then, some explanation is required.

First, terms. Unfortunately, they are all so closely related that they might be easily confused.

> *X is an **analogue** iff x is one of the objects or types of objects being compared in an analogical argument.*
>
> *X is an **analogate** iff x is a property that is used in an analogical argument to compare analogues.*
>
> *X is a **primary analogate** iff x is an analogate that both analogues are known to have.*
>
> *X is a **secondary analogate** iff x is an analogate that the conclusion of the analogical argument infers is had by both analogues.*

So in the standard form above, the objects of type X and Y are the analogues, the properties ABC and D are primary analogates and the property E is the secondary analogate.

Six Analogical Rules

Just like the other arguments we've looked at, there are a few constitutive rules—rules that describe the make-up of good members of this class of argument. In total, there are six rules that describe good analogical arguments.

We'll look at how each one of them works in partnership with the others.

The Rules of Quantity and Relevant Analogates

Our first rule, the ***Rule of Quantity*** (also, RQ) holds that

> **RQ**: *The more analogates the analogues have in common, the stronger the argument.*

The second rule, the ***Rule of Relevant Analogates*** (or RRA), is so closely related to RQ, that its clearest if we discuss them together. It holds that

> **RRA:** *The more relevant the primary analogates are to the secondary analogate(s), the stronger the argument.*

Suppose you have this argument:

> **Argument 1:** *Simon and Hannah both took the same three math classes at LC High School. Both earned straight As. Simon just took the math part of the University of Washington entrance exam, and he passed. Hannah is taking the UW test tomorrow, so she'll probably pass.*

Compare that with this argument:

> **Argument 2:** *Simon and Hannah both took the same six math classes at LC High School. Both took all their classes from Mr. Williams, and both earned straight As. Simon just took the math part of the University of Washington entrance exam and passed. Hannah is taking the UW test tomorrow, so she'll probably pass, too.*

Notice how the second argument, which has more primary analogates, gives you more reason to accept the conclusion. That's the RQ working.

Now suppose we add even more analogates:

> **Argument 3:** *Simon and Hannah both took the same six math classes at LC High School. Both took all their classes from Mr. Williams, and both earned straight As. When Hannah took calculus from Mr. Williams in the fall, the cafeteria added two new and popular menu items and the president gave a nationally televised speech. In the spring, when Simon took calculus, the cafeteria added two more items to its menu, and the president gave another nationally televised speech. Furthermore, Hannah watches Game of*

Thrones and Doctor Who regularly, and so does Simon. Simon just took the math part of the University of Washington entrance exam and passed. Hannah is taking the UW test tomorrow, so she'll probably pass, too.

More primary analogates! Primary analogates for everyone! But is the argument stronger for it? Not so much. This is where the RRA enters the picture. Sure, we want as many primary analogates as are useful, but we want them to be *relevant* to the secondary analogate.

Say that instead of the additional primary analogates in argument 3, we added these: Simon's calculus class used the same textbook as Hannah's, and both classes had high class averages. Certainly these analogates are relevant to the conclusion.

What makes for relevance, though?

There are two kinds of relevance that informs the RRA. The first is ***statistical relevance*** and the second is ***causal relevance***. Notice that the analogate about the textbook indicates a causal relevance—which textbook one uses in a class can be a part of the cause of one's later success on a math exam—and the analogate about the class averages has statistical relevance—people who do better in difficult math classes are statistically more likely to do well on college entrance math exams.

So that's how our first two rules work.

The Rule of Relevant Disanalogates

Closely related to the RRA is another general rule for analogical arguments. It's called the ***Rule of Relevant Disanalogies*** (or the RRD).

RRD: *The larger the number of relevant disanalogies between the analogues, the weaker the argument.*[*]

*X is a **disanalogy** between objects A and B iff x is a way in which A is significantly different than B.*

So think about Simon and Hannah. Suppose that Simon took all his classes from Mr. *Bob* Williams and Hannah took hers from Mr. *Glen* Williams. Or suppose that Simon took his classes recently and Hannah took them all a few years ago (from the same teacher). These dissimilarities have relevance to the probability of the conclusion's truth. Thus, the RRD applies.

Notice that Simon and Hannah have other dissimilarities: gender, skin tone, eye color, whether they are cat lovers or not, the kinds of cars they drive, parents' names, favorite foods. But since these are irrelevant (causally and statistically) to the secondary analogate, we can dismiss them. Notice how the RRD explains something of the RRA and the RQ. It tells you that the flip side of quantity applies, too—that more relevant disanalogies as well as more relevant analogates inform the probability of the conclusion's truth.

The Rule of Diverse Analogates

The next rule also further explains the first two, bringing in a deeper explanation of relevance. The ***Rule of Diverse Analogates*** (RDA) holds that

RDA: *The more diverse the primary analogates, the stronger the argument, provided that the diversity concerns properties related to the secondary analogate.*

So consider this little argument:

I know seven people who own Ford cars and each car has been reliable. (They're all Mustangs.) So, if I buy this Ford Pinto, I'll have a reliable car.

Not very convincing. Sure, the Fords were all reliable, though there was a relevant disanalogy in the model of the cars. On the other hand, consider this:

I know seven people who own Fords. All have been reliable. One is a Taurus, another a Mustang. Two are trucks: an F-150 and a Super Duty. One is an Escape, another an Explorer, and the last one is a Fusion hybrid. If I buy this new Ford Escort, I'll have a reliable car.

Notice how the diversity lends credibility to the inference that *all* (or most) Ford makes are probably reliable, thus *this* Ford make is likely to be reliable.

The Rule of Conclusion Specificity

Finally, there's a rule similar to the third criterion in the determination of strong inductive generalizations. This is the ***Rule of Conclusion Specificity*** (or the RCS).

RCS: *The more specific the conclusion, the weaker the argument*.

[*] This is called the ***degree of disanalogy***. So we can state this rule thus: *The greater the degree of disanalogy, the weaker the argument.*

The more specific your conclusion is, the easier it is to prove it wrong, thus, the weaker the inference. Suppose that the Ford owners all report that they haven't had to take their cars to the shop for maintenance more than once every other year or less. Now if you changed the conclusion to "If I buy this new Ford Escort, I will have a car that won't need to go to the mechanic but once every other year." But that's easily debunked, especially if there happens to be a recall on the Escort that isn't on the other models.

False Analogy

If you make an argument from analogy that fails to meet the criteria for a strong analogical argument, you are making a fallacy. John Stuart Mill called those fallacies that specifically attempt to establish a conclusion on irrelevant analogies the fallacy of *False Analogy*.

So, for example, consider this argument.

> *Joe is probably lazy because his wife Sharon is lazy.*

The truth of the premise (Sharon is lazy) whether or not it's true, is totally *irrelevant* to the truth of the conclusion. Whatever similarities Joe has with Sharon could be brought out: they have the same address, the same kids, the same value system, and whatever other similarities spouses generally share. Still, the conclusion does not follow because although unstated, the dissimilarities are also many, and likely far more relevant to the conclusion than the similarities.

Sometimes, of course, we let images make the fallacious argument for us:

The Appeal to Hitler

A specialized false analogy has arisen in the last 60 years that has, by dint of its overwhelming overuse, earned it the status of its own name and category. This fallacy was named by Leo Strauss in 1951, and it's never been more used than today. The fallacy is an argument that attempts to reduce an opponent's argument to discredit and scorn by comparing it to a view that would have been held by the Nazi party. It's a distraction tactic, attempting not to use analogy to further a strong argument based on reason, but to use an emotionally-charged comparison to extreme evil in order to derail an opposing view. It plays with fear, hate, and false analogy.

continued…

It might be useful to know that the T-4 program was the Nazi "eugenics" program that was signed into law by Hitler in 1939. This (backdated) law justified the physician-directed murder of over 270,000 people who were judged "incurably sick" (including blindness, paralysis, autism, racial "impurity," etc.) between 1939-1945. One might see how dangerously powerful the use of this fallacy can be, in that it can cause people to avoid any healthcare policy from fear that it will enable the government to direct doctors not to aid, but to murder the sick.

The Appeal to Hitler,

continued.

The ***Reductio ad Hitlerum*** needn't refer to Hitler at all, but to *any horrifying entity* that can draw a comparison that so overwhelms the discussion one feels a need to respond to the fallacy, not further a useful argument. Both sides are guilty of this.

And the comparisons are totally effective if they intend to divide us so completely that we cannot reason critically anymore, because we're stuck in a tit-for-tat meme war. On the other hand, if it's the truth we seek, this isn't going to get us anywhere near it any time soon.

continued…

Absolute dictator-in-waiting with dog

Absolute dictator-in-waiting with dog

The Appeal to Hitler,

continued.

The *redutio ad Hitlerum* is possibly the *most* insidious fallacy we've seen thus far, standing right up there with the ambiguity fallacies when used by mental manipulators and propagandists.

What it does is twofold. On the surface, it appeals to a strong emotion to manipulate one into associating horror with the targeted analogue (in the memes: Bill Gates, Obama, Muslims, Trump, Bush, Bill Clinton). This is bad enough, in that it gets people to react uncritically, rather than think carefully.

But deeper down, the fallacy is more profoundly destructive. By comparing current antagonists to historical figures who committed unthinkable atrocities, we reduce the atrocity to the level of the current antagonism. That is, we make the horror less horrible. And as time passes and the fallacy is repeated, it becomes easier and easier to think of the actions committed by (in the meme above) *Hitler* [over 6 million people brutally dehumanized and tortured to death], Castro [hundreds of thousands of people tortured, dehumanized, and murdered], *Qaddafi* [at least 10,000 people killed in his terroristic rise to power], *Stalin* [between 20 and 60 million people imprisoned in slave camps, and otherwise killed during his paranoid rule], *Idi Amin* [killed between 300,000 and 500,000 people—almost a quarter of the population of the nation (Uganda) in his eight year reign], *Mao* [50 to 80 million killed in his "cultural revolution" of China], *Pol Pot* [1.7 million killed—particularly anyone with an education—in his attempt to burn Cambodia to the ground to "begin again"], and *Kim Jong-Il*, whose North Korean atrocities' number is unknown, and who looked little like that picture taken from the 2004 farce *Team America: World Police*. The unthinkable becomes thinkable.

Gates is as bad as Hitler? Really? Guess Hitler wasn't all that bad. Trade deals are just like fascism? Guess that's bad, but fascism must not be unspeakably horrifying, just unfair. Huh.

This fallacy's power grows as it is increasingly used. So don't use it. Or we become more easily accepting of real fascism if—when—it does rear its brutal head.

A SLIPPERY SLOPE

A ***slippery slope*** argument arises when one rejects distinctions or stages.

Certainly there are problems in determining, for example in the abortion discussion, *where* the stages, distinctions, or duties separate. But to infer that one *cannot make any distinctions without falling into arbitrariness* is to commit the slippery slope fallacy.

*X is an **arbitrary distinction** iff*

1) *there is no justification at all for x, or*
2) *there are a number of justifications for various ways of drawing distinctions, but the justification for drawing x is based primarily on the desire to get a certain conclusion*

Note that the slippery slope fallacy accuses *any* distinction of being arbitrary, when in fact there are many useful and acceptable distinctions that are not arbitrary at all.

The slippery slope fallacy has another interesting characteristic nowadays. The ***statistical slippery slope fallacy*** is in the *accusation of arbitrariness when the distinction is not arbitrary.*

continued…

As an extra credit worth up to one task assignment, find *five* images online that demonstrate the fallacy *redutio ad Hitlerum*. These can be memes, photographs of protests, editorial comics, or image captures of online conversations. These images must *explicitly* attempt to link the subject with Hitler or the Nazi party. Explain how each image commits a fallacy, then refute that fallacy with careful reasoning. Note that it isn't just those you disagree with who commit this fallacy. Your side does, too.

So on that happy little note, on to Task 50, in which we attempt to arm ourselves against bad induction by learning good reasoning. For the following, reconstruct the analogical arguments contained in each. Identify the primary analogates—including those that are unstated but still necessary for the conclusion. Then assess the strength of the arguments on the basis of the rules for analogical arguments. If relevant, discuss any cases where further background information is necessary to determine relevance.

1. Tar (from cigarette smoke) when smeared on the skin of mice in laboratories causes skin cancers. So smoking causes lung cancer in humans.
2. My last pair of Brand X running shoes were comfortable, gave excellent support to my feet and ankles, and lasted a long time. I expect my new pair of Brand X running shoes, which have the same design, to give the same kind of service as the old pair.
3. Wives, be subject to your husbands as to the Lord, for the husband is the head of the wife as Christ is also the head of the church; as the church is subject to Christ, so wives are to be subject to their husbands in every respect. (Eph. 5:22)
4. The force that binds planets to the sun (gravity) obeys the same general form of law as the electrical force that binds electrons to the nucleus

A SLIPPERY SLOPE,

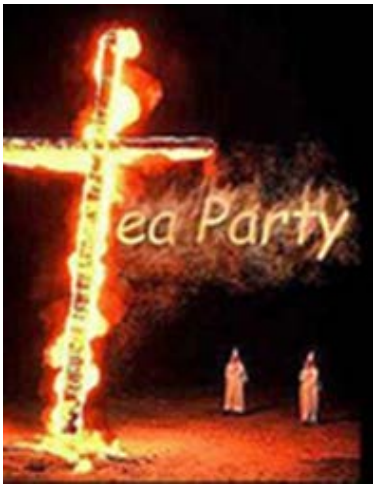
continued.

However, nowadays people who commit the fallacy—talk show and radio hosts, politicos, activists—tend to accuse those who are making non-arbitrary distinctions as the ones who are committing the fallacy. They call the stair-steps of distinctions a slippery slope, when *really* the slope is the cliff face of all-or-nothing. Ironically, it is the *accuser* who is committing the fallacy they accuse the other of committing!

There is also a fallacy in *causal* reasoning known as a slippery slope, and we'll discuss it in the next chapter when we come to causal inferences.

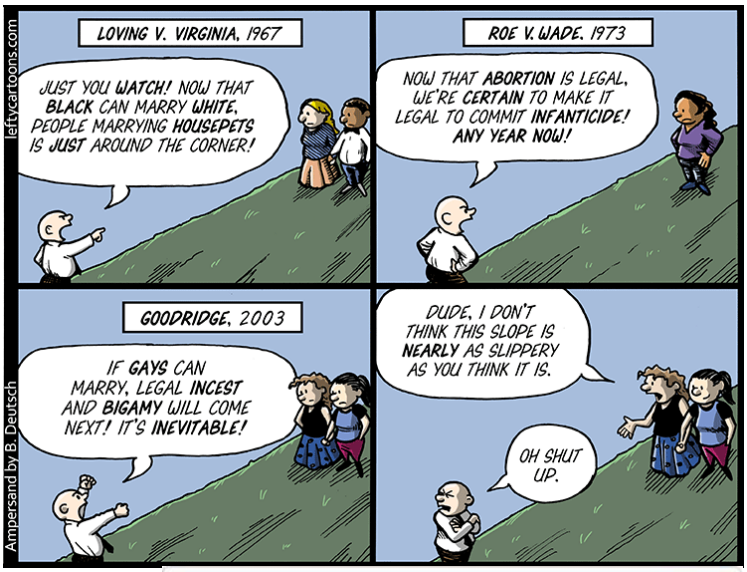
It's time to revisit Task 45. Recall you were to find 3 fallacies relevant to statistical syllogisms. Now you need to find 3 generalization *and* 3 analogical fallacies (for a total of 9). Scout around in those murky internet corners where trolls might take up residence.

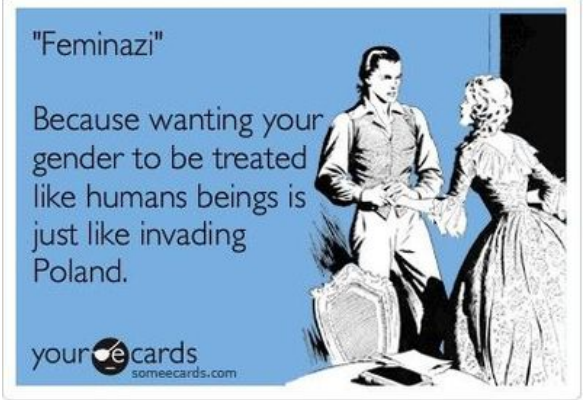
Explore Facebook, Twitter, Reddit, BuzzFeed, and the comment sections of political or social blogs. Have at it. Bring these six new fallacies to class for a team project, and be ready to turn in the whole Task (all 9 fallacies) during class.



to the atom [Both gravity and electricity decrease in strength with the square of the distance between the bodies or particles]. Therefore, the electron particles, which have negative charges, when attracted by the positive electricity of the nucleus, should move around it in the same way the planets move around the sun. (Ernest Rutherford)

5. In the discussion of human affairs and especially of abortion, controversy can range over the moral rights, duties, interests, standards, and religious views of the parties. Moral values are in issue. I am, in fact, concerned with none of these matters. I am concerned and concerned only with the law of England as it applies to this claim. My task is to apply the law free of emotion or predilection…The fetus cannot, in English law…have a right of its own until it is born and has a separate existence from its mother. That permeates the whole of the civil law in this country…and is indeed the basis of the decisions in those countries where law is founded on the common law, that is to say, in America, Canada, Australia… (Sir George Baker)





A QUICK LOOK AT EQUAL-OPPORTUNITY OFFENDERS

A Plethora of Fallacies

Any appeal to emotion is breaking one of the rules of discourse, but because it appeals to *feels* not evidence, it is by default fallacious (and that's why the rule exists, to point out this kind of inferential error). So we'll start with these emotional abusers.

Appeals to Emotion

Generally speaking, any argument that relies on your feels rather than your reasons is an ***appeal to emotion***. Thus, an appeal to "fit in" (*ad populum*) or an appeal to be very afraid (*ad Hitlerum*) are also appeals to emotion. But like *ad pop* and *ad Hitlerum*, there are other specialized emotional appeals that are so prevalent that they get their own names.

Argumentum ad Baculum

The word *baculum* is Latin for "cudgel"—like a policeman's stick. The fallacy ***ad baculum***, then, is an appeal to force, to fear—it's a threat. Basically, you believe x is true because if you don't believe x, then you will be threatened with y. And you ***do not*** want y. So x. It is *much* like the mistake we'll see in chapter 9 (confusing consequences of x being true with evidence for x being true).

In standard form, the *ad bac* looks like this:

1. If Somebody S accepts P as true, then Q.
2. S acts to prevent Q and succeeds.
3. So Q is not true.

4. Therefore, P is not true.

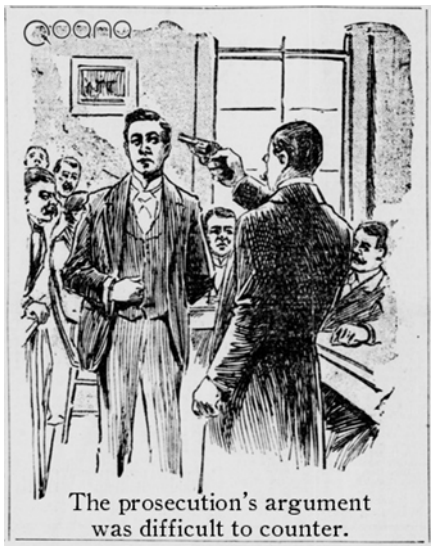
It's like a *modus Tollens* and an indirect argument all wrapped up in a worry.

President George W Bush used an *ad bac* as his primary re-election strategy. It ran like this:

> *You don't want to switch horses midstream. Vote for me.*

Okay, so the fallacy was a *lot* of things.* Ambiguous. False Analogous.† Presumptuous. But effective.

The threat part was the unstated assumption that if you accept the


The prosecution's argument was difficult to counter.

other candidate, then the terrorists will win (whatever that means). So prevent that possibility and vote for him. Of course, there's no evidence for anything either way, but that's why it's effective. Emotions are powerful manipulators.

Here's a few more examples of *ad bac* reasoning:

> *If we allow people from Muslim or Hispanic countries to enter the USA, then they will commit terrorist actions against us, take our jobs, rape our women, and fill our streets with crime.*

or

> General: "If we accept capitulation, the enemy will take the chance to slaughter us all."
>
> Colonel: "So far they have treated captives adequately."
>
> General: "This time they won't. And you better believe me if you don't want to find yourself rotting in a mass grave."

or

* It's important to realize that a *single argument* can contain *multiple fallacies*. In this case, I count at least four: category mistake, false analogy, affirming the consequent, and *ad baculum*.

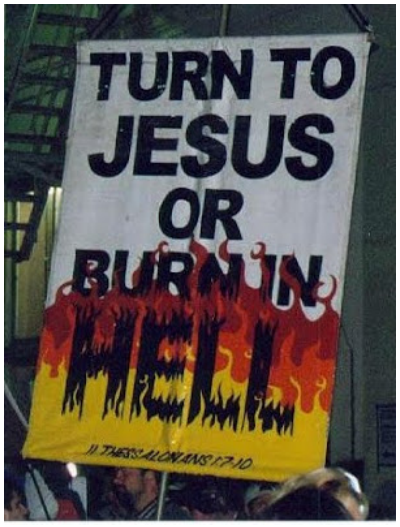
† The false analogy here bears discussion. The idea was that if you're crossing a stream, you can't switch horses. Of course, this assumes you want to cross the stream. But waging a war is importantly and relevantly disanalogous to crossing a stream, and of course, this all presumes that, even if it were analogous to stream-crossing that we were going the right direction and knew so. Thus, there are relevant disanalogies no matter how you take this image. Fallacy.

If we accept any form of gun regulation, crime will skyrocket, and we will have no way to protect ourselves against the gun-toting criminals who will terrorize us.

Sometimes the *ad bac* is more direct. The conclusions are not "out there" but imminent, usually a threat offered by the giver of the argument:

Accept what I say is true, or suffer the consequences of my wrath!

This fallacy is, unfortunately, most often used in abusive religious groups that use God as their cudgel. Take Westboro Baptist Church, for example—or those inspired by their threatening ways:



And although it was often used by chain letters, it has been mastered in the world of social media, where *ad pop* and *ad bac* have married and live happily in the flaming carnage of shattered reason:

Hit "like" if you are a good person who cares about other humans. Copy and Paste this to your wall to prove you're not a jerk who hates people. I'll know if you did, and I'll be unfriending any who don't show me they're good people. (Kurle literalist translation)

Ad Miseracordiam

Another approach towards fallacious reasoning is the well-worn *appeal to pity*, or ***ad miseracordiam*** fallacy. The Latin *miseracors* means "mercy", and it derives from the words *misera* (meaning *misery*) and *cor* (heart). It quite literally means an appeal to pity or mercy.

The first recorded use of the appeal to pity was in 1824, in *Edinburgh Review.* The writer Ronald Munson noted that "not all mention of factors which appeal to our sympathies is irrelevant [to an argument], and the trick is to distinguish legitimate appeals from spurious ones."

The spurious ones are the ones used just to tug at us, without reference to relevant evidence.

A humorous example is offered in *The Simpsons*, when Sideshow Bob argues that he needs to be released from prison (where he is confined because of multiple attempts at murder) because

My incarceration is cruel and unusual punishment. First, my prison-issued shower sandals are grossly undersized. Secondly, the prison book club consists mainly of prisoners who club <u>me</u> with books.

This fallacy is, at least in my world, a fan favorite among desperate students with poor foresight.

Please, I have to pass this class! I know I didn't turn in homework or write the papers or even show up to class that often. I know I bombed the quizzes, but if I fail the class, I'll lose my financial aid! You can't give me an F!

In this case, the fallacy has unintended consequences. By making such an appeal, the student is asking the professor to violate the validity of certification by undertaking grade inflation (which ruins the very meaning of a grade, which in turn ruins its transferability, etc.), and at the same time, the student is making the professor feel like a jerk for being intellectually honest. And at the selfsame time, the student is telling the professor that the problems the student had were in fact the professor's problems, and

that the professor has the obligation to respond to the self-inflicted consequences of the student.

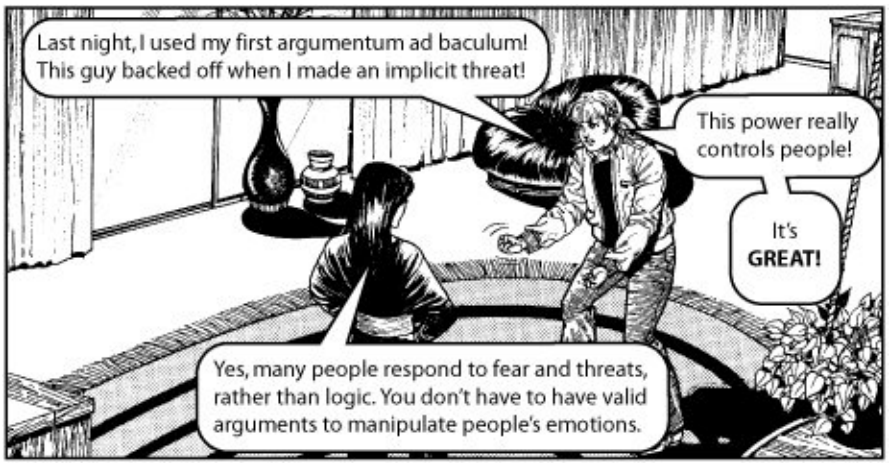
How to get on your professor's unhappy side in one easy step.

There is *nothing* wrong with pity, and indeed, it is often legitimate, and circumstances are often relevant. Consider a different student scenario:

> *Please, I have to pass this class! I know I've missed a lot of work, but xyz has been going on, and I'm wondering if I can to discuss what is an acceptable alternative workload for me. Would you be willing to assign an Incomplete, and allow me to demonstrate my ability to pass this class?*

Legitimate pity takes legitimate pathways.

The appeal to pity, like any appeal to emotion, is a fallacy because it *appeals to feels* instead of offering good reasons to support its conclusion.



A favorite rhetorical tool of propagandist Jack Chick, the *ad baculum* fallacy is being presented here as a weapon of choice by atheists or members of other groups against Christians. Hence, Chick's reference here to the *ad baculum* is itself an *ad hominem*!

THREE DISTRACTION FALLACIES

The favorite techniques of mental manipulators are aimed at distracting the hearer(s) from the issue at hand. Three such attempts each merit discussion.

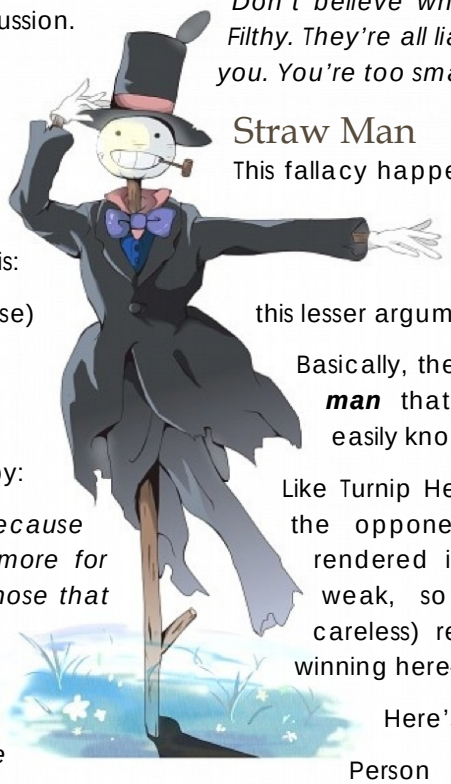
Poisoning the Well

This fallacy is the pre-emptive strike of *ad hominem* argumentation. Its aim is to discredit what an opponent might say later by creating undesired associations now. The argument looks something like this:

1. Unfavorable information (true or false) about person S is presented.
2. So any claim S says later will be discredited by this information.

Examples of this fallacy are easy to come by:

> *My opponent will disagree with me because he's a corporate sellout who wants more for companies that trade overseas than those that remain in the USA.*
>
> *They'll tell you that I'm insincere, that I am only in it for fame and money. They want you to believe them because they're afraid of me, afraid of the truth.*
>
> *Don't believe what the press says about me. Filthy. They're all liars, making up stories to scare you. You're too smart for that.*



Straw Man

This fallacy happens when the initial argument is ignored or rephrased into a lesser (invalid or weak) shadow of itself, and then this lesser argument is attacked and refuted.

Basically, the worse argument is the ***straw man*** that the fallacy-committer can easily knock down.

Like Turnip Head in *Howl's Moving Castle*, the opponent's argument is disabled, rendered into something helpless and weak, so that the unscrupulus (or careless) reasoner can win. It's about winning here—not about truth.

Here's an example:

Person 1 says "we should support

abortion because it'll make society function more smoothly."

Person 2 says "if abortion is made acceptable, then prostitutes and those who have children out of wedlock can just carry on with their lives. Prostitution and sex before marriage? You're saying that you accept that. You're saying that this is what we need to endorse to 'make society function more smoothly.' That's a load of rubbish."

You get the idea. Person 1 was likely *not* thinking what person 2 said, but by reducing the argument to this particular scenario, 2 gets to "win" the discussion, without ever approaching 1's reasoning, which we don't even get to discover because of the dismissive nature of this silencing fallacy.

"New guy in accounts. He's nice enough but don't try to argue with him."

Red Herring

In the movie *Cool Hand Luke*, the main character attempts to escape a chain-gang road crew to which he has been assigned in a classic case of the punishment far overreaching the crime. To evade capture, Luke scatters chili pepper all over the road that he has just crossed, in order to confuse the dogs tracking him.

This is the idea behind the ***red herring*** fallacy.* In 1807, William Cobbett wrote how he used red herrings to lay a false trail in order to confuse dogs that were tracking a hare. From this arose the name of the fallacy, and the use of the image in prison escape scenes ever since.

The fallacy uses the same technique. Like a number of other fallacies, it needn't be deliberate. People unthinkingly commit fallacies daily. It isn't just the nefarious that are to blame.

Here's a few examples of the red herring in play. Notice how the "evidence" is utterly irrelevant to the conclusion, and rather works to get people thinking about different topics.

> *"I think we should make the academic requirements stricter for students. I recommend you support this because we are in a budget crisis and we do not want our salaries affected."*

Mother: *Time to go to bed, kiddo.*
Child: *How do ants feed their babies?*
Mother: *Don't know. Close your eyes, now.*
Child: *But mama, do ant babies cry when they're hungry?*

The child here, like the member of the academic committee above, are both presenting information that is totally irrelevent to the claim or issue at hand. Academic requirements are probably only tangentially related to budget concerns at a college, and the plight of the hungry ant-babies is utterly irrelevant to the duties of bedtime.

The red herring is a favorite plot device in movies and novels, but when it is presented instead of evidence in an argument, it's a fallacy. What's good for the goose is, in this case, definitely *not* good for the gander.

* It's often also called a MacGuffin, a False Flag, a Decoy, a Snipe Hunt, Chewbacca's Defense, or the Garden Path. Not kidding.

TEAM PROJECT: GENERALIZATIONS & ANALOGIES ON THE DARK SIDE

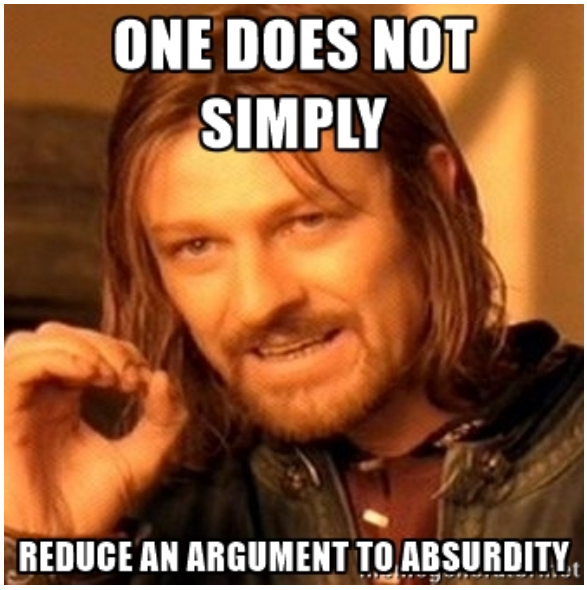
INDUCTIVE & INFORMAL FALLACIES

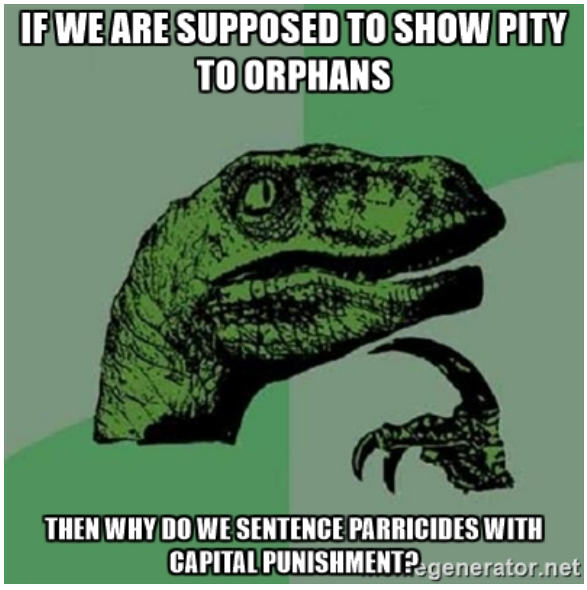
Look over the six new fallacies from Task 45 that each team member has collected. As a team, discuss how each of them manipulates good reasoning, and select *four* of each kind (generalization and analogical) from among all your team members' findings for specific analysis and discussion. For each of these eight instances, prepare answers for the following questions:

1. What fallacy does this commit?
2. What is the reasoning that goes wrong in this that makes it a fallacy? (Broken rules of inference? Broken generalization or analogical rules?)
3. Put the argument into standard form.
4. Can you repair this argument so that it no longer commits the fallacy? Show attempts to do so for each instance chosen.
5. If you can repair the argument, offer it in standard form and explain how it is no longer a fallacious argument. If you cannot, explain why you cannot do so.

Make sure every team member agrees on every answer to each question on this task, ensuring that all agree especially on how the fallacies are committed and the forms of the original and any repaired arguments.

Your instructor will set the due date for this project. Write that date on the assignment, along with the names of all your participating team members. Turn in *one* paper for the whole team. Please write legibly.





EXTRA! EXTRA! EXTRA CREDIT!

For up to a total of *four* tasks, create memes that explain or illustrate informal fallacies.

Each meme must follow the criteria of the meme it uses (for example, grumpy cat follows a different pattern in its memes than the philosoraptor, Y U No, Willy Wonka, success kid, the most interesting man in the world, Futurama Fry, Bad Luck Brian, or other well-used memes.

Go to *memegenerator.net* to create your memes. Then bring them to class in a way your instructor requires.

Three well-made memes are worth one task grade.