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Steve Miller

Kennesaw State University, jstevemiller@gmail.com

Cherie Miller

Kennesaw State University, cmille72@kennesaw.edu

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Logic: Common Fallacies

Steve and Cherie Miller

Taken with kind permission from the book *Why Brilliant People Believe Nonsense* by J. Steve Miller and Cherie K. Miller

Logic and Logical Fallacies

The dull mind, once arriving at an inference that flatters the desire, is rarely able to retain the impression that the notion from which the inference started was purely problematic.

— George Eliot, in *Silas Marner*

Brilliant People Believe Nonsense [because] They Fall for Common Fallacies

Even the brightest among us fall for logical fallacies. As a result, we should be ever vigilant to keep our critical guard up, looking for fallacious reasoning in lectures, reading, viewing, and especially in our own writing. None of us are immune to falling for fallacies.

Until doctors come up with an inoculation against fallacies, I suppose the next best thing is to thoroughly acquaint ourselves with the most common fallacies. I chose the following fallacies by comparing a dozen or so university sites that list what they consider the most common fallacies that trip up students.¹

Snoozer Alert!

Sorry, but this chapter and the next don't contain fascinating stories and intriguing intellectual puzzles. But please resist the temptation to skim to the following section. To think critically, we simply must familiarize ourselves with logical fallacies. Otherwise, we're fair game for all sorts of nonsense. Think of it like math. While the formulas themselves might be boring, we learn them in order to hopefully use them for something practical in the future. You'll assuredly find many of the below fallacies used in conversations and articles.

Think of logical fallacies as the grammar you must master to learn a foreign language. Before you can use a language practically (like writing a note to that ravishing foreign exchange student in her native language), you simply must learn the vocabulary and grammar. Similarly, logical fallacies are a part of the vocabulary of logical thinking. I'll try to make understanding them as painless as possible.

So learn these well. Reflect upon them. Look for them in the media. Familiarizing yourself with errant reasoning goes a long way toward helping you to write, reason, speak, and listen with more critical precision.

Tip: If some of my definitions and examples don't sufficiently clarify, look up the fallacy in Wikipedia or other sources for alternate explanations.

Below this list of fallacies, I'll give you a bit of practice by asking you to connect a fallacy with an errant argument. Finally, I'll give a few tips on checking your own argumentation (particularly in writing and speeches) for fallacies.

Twenty-Seven Common Fallacies

Ad Hominem

translated into English: "against the person", aka "damning the source," the "genetic fallacy," "poisoning the well," related to "tu quoque" (you, too!). Defined as attacking the person (e.g. - can't be trusted, is a moron, etc.) rather than the argument.

Example: "I don't believe anything he says because he's a biased political liberal." Yet, shouldn't we assess his arguments based upon his evidence and argumentation, rather than solely because of his political label?

Caution: Sometimes a person has indeed been shown to be untrustworthy. Cautioning readers that he has been repeatedly caught in flagrant lies isn't an ad hominem fallacy. Noting a person's lack of integrity can be valid, if his argument requires us to trust him.

Tip: If the person's character is either irrelevant to the argument or unknown, focus on the facts and arguments.

Affirming the Consequent



aka "converse error" or "fallacy of the converse." This is a formal fallacy (the *form* of the argument isn't valid) that assumes if the argument is valid going one direction, it's also valid when run the opposite direction.

Example:

Premise 1: If I get the flu, I'll be nauseated.

Premise 2: I'm nauseated.

Conclusion: Therefore, I have the flu.

This is invalid because while it may be true that if you get the flu, you'll get nauseated, the converse isn't always true. You can be nauseated and yet not have the flu. Perhaps you have a hangover, or are pregnant.

Tip: If you see an argument in the following form, it's affirming the consequent:

Premise 1: If P, then Q

Premise 2: Q

Conclusion: P

Appealing to Extremes

taking an assertion to an extreme, even though the arguer may never take it to that extreme.

Example: "Avid health advocates blow out their knees by their 50s by running marathons. Therefore, don't prioritize regular exercise." But not *all* avid health advocates run long distances as their primary exercise. It's an extreme statement.

Argument From Authority



aka "*argumentum ab auctoritate*," "appeal to authority." Claiming that a position is true because an authority says it's true.

Even when the referenced authority is a true authority in the field, arguments should ultimately be based upon facts and reasoning rather than quoting authorities. Also beware of people quoting false authorities, like football stars or models selling insurance or technology.

Example: "We know global warming is true because a number of great scientists assure us it's true."

Caution: Sometimes citing authorities can be a valid part of an argument. For example, if a hefty percentage of respected scientists who specialize in a related field are all warning us about the dangers of global warming, this in itself provides evidence that global warming is at the very least a viable theory

that needs to be seriously considered. Alternately, if no respectable scientists took global warming seriously, then this would surely be a strike against it, even though ultimately we're looking for hard evidence rather than numbers of testimonies.

Tip: Ask yourself,

- Are these truly experts in the field I'm discussing? Would some view them as either biased or holding to fringe views on the subject?
- Have I explained clearly how I'm using these authorities as evidence, within the larger scope of my argument?

- Would it be relevant to explain the evidence that led the authorities to come to their position on the subject?
- Are you using their testimonies as helpful resources, quoting them as a part of a larger argument, or quoting them as a slam dunk argument to make your case? Make sure you're not saying something like: Dr. Authority believes x, so we should believe x as well.

Argument from Ignorance



aka "appeal to ignorance," "argumentum ad ignorantium," related to "non-testable hypothesis." Assuming that a claim is true because it has not been or cannot be proven false (or vice versa, assuming that a claim is false because it has not been or cannot be proven true.)

Example: Nobody can prove that my client was at the scene of the crime, therefore he's innocent. (Of course, he may be in fact guilty. We may just lack sufficient evidence that he was there.)

Caution: While some would say "absence of evidence is not evidence of absence," this isn't true in every case. For example, if I walk outside and see no evidence of rainfall (no puddles, the streets aren't wet), I'm justified in taking this as evidence that it hasn't

rained recently. In this case, the absence of evidence for rain is indeed evidence for the absence of rain.

Band Wagon



aka "*ad populum* fallacy," "appeal to widespread belief," "appeal to the majority," "appeal to the people." If a large number of people believe it, it must be true. It appeals to our desire to fit in.

Example: "Most people use Microsoft products, so they must be the best."

Example: "Everybody I know uses Meth, so it can't be that bad."

Caution: Some people naturally despise majority opinion and relish holding contrarian positions.² Those who disagree with opinions held by a majority of intelligent people should at least make sure they understand the reasons informed people give to justify their beliefs.

Tip: Remember that popular opinion is often wrong, and what's cool today may seem foolish tomorrow. In fact, it's often those who stand against the crowd who change the world. As Apple, Inc. said it in their motto: "Think different."

Begging (Evading) the Question



aka "circular argument," "*petitio principii*," translated "assuming the initial point." The conclusion is assumed in a premise. This typically isn't as obvious as it first sounds.

Example: The Writing Center at the University of North Carolina gives a good example.

"Active euthanasia is morally acceptable. It is a decent, ethical thing to help another human being escape suffering through death."

At first read, it may seem pretty straightforward. But let's examine it as a premise and conclusion:

Premise: It is a decent, ethical thing to help another human being escape suffering through death.

Conclusion: Active euthanasia is morally acceptable.

Look closely at these two sentences and you'll discover that they actually do nothing more than state the same thing twice; the conclusion merely dresses up the premise in different words. "Decent, ethical" in the premise is worded "morally acceptable" in the conclusion. "to help another human being escape suffering through death" in the premise becomes "active euthanasia" in the conclusion.

Thus, the argument doesn't tell us much, if anything, about *why* euthanasia is morally acceptable. It leaves us asking the implied question over again, "But *why* is it acceptable?", showing that the premise and conclusion merely begged (i.e., evaded) the question.

Tip: Typically, rewriting the argument in the form of premises and a conclusion reveals when a question is being begged. Do you agree with the premises? Are there gaps in the line of argument? Does the conclusion say nothing more than the premises already stated?

Bifurcation

aka "false dichotomy," "black-or-white fallacy," the "either-or fallacy," related to a "false dilemma." The argument makes it appear that there are only two possible answers, but there are actually more.

Example: We discussed examples in the last chapter.

Tip: Ask yourself, are there really two and only two options? If not, are any of the other options viable? Have all other options been sufficiently ruled out?

Dogmatism



Not even considering an opponent's argument, because of overconfidence in one's own position.

Statement: "Mercedes makes the best car ever."

Retort: "But according to *Consumer Reports*..."

Dogmatic Defense: "I don't care what those studies say; I *know!* Mercedes is the best."

Emotional Appeals



An appeal to emotion that is irrelevant (or largely irrelevant) to the argument.

Example: "The death penalty can't be right. Have you seen a person die in an electric chair?"



Caution: Emotion can often be a legitimate part of an argument.



Example: "Look at these poor birds dying from an oil spill. This demonstrates one reason we should take great precautions to avoid such mishaps."



Equivocation



related to "semantics," "playing with words." Using the same word with more than one meaning, thereby invalidating the argument.

Example: "Of all the animals, only man is rational. No woman is a man. Therefore, no woman is rational." In the first instance, "man" means "mankind," whereas in the second instance, "man" means "the male gender." This change in meaning invalidates the argument.

Tip: Look carefully at the argument's important words. Are they used in a consistent way, or do they shift meanings?

Fallacy of Exclusion

Focusing on one group's behavior as if the behavior is exclusive to that group.

Example: "Watch those women drivers. They're always thinking of something other than their driving." But are male drivers any better? Shouldn't this statement be based on psychological studies and statistics of accidents rather than personal observations of one sex?

False Dilemma

aka "false dichotomy," "either/or," "black/white," "excluded middle." A form of bifurcation, this fallacy allows for only two extreme positions, although a legitimate middle ground might be arguable. Sometimes they paint one side as so extreme

that nobody could ever agree with it

Example: "You either support Israelis in Palestine or you're an anti-Semite."

Example: "Are you for George Bush or are you for the terrorists?"

Tip: When only two extreme alternatives are given, look for middle ground.

Faulty Analogy

aka "weak analogy." Comparing two similar things to make a point, but the analogy breaks down because of one or more significant dissimilarities.

Example: "The war in Afghanistan is nothing more than a modern day Vietnam war."

Tip: Is the analogy truly alike in all relevant respects?

Glittering Generality

aka "Weasel Words." Using words in such a broad way that almost everyone resonates with them in the same way, thus lending credence to the argument. Thus, those who argue that their position is really about "freedom," "love," "human rights," etc., can gain a following, even though the words may mean different things to different people, or are being used in such a vague way as to be essentially meaningless.

Example: "Allowing this controversial artwork in our place of business is really about guaranteeing our freedoms, in this case our freedom of expression." Perhaps, but what if the artwork trivializes or misrepresents your business, or disgusts and demoralizes your employees? Framing it as solely an issue of freedom seems to make it a glittering generality.

Hasty Generalization

related to "non-representative sample," "fallacy of insufficient statistics," "fallacy of insufficient sample," "fallacy of the lonely fact," "leaping to a conclusion," "hasty induction," "*secundum quid* (converse accident). A conclusion was reached via inadequate evidence, such as when a sample cited was inadequate (e.g., atypical or too small) to warrant a generalized conclusion.

Example: "Most Hollywood stars have terrible marriages. Just read the tabloids." Their conclusion may or may not be true, but reading tabloids is no way to decide the issue. News sources by their very nature select what's "newsy." Since a nasty divorce is more newsworthy than a stable marriage, the former gets the press, giving the impression that most Hollywood stars can't hold a marriage together.

Example: "I'll never fly again. I read about too many accidents and hijackings." Again, you don't hear about the thousands of flights with no incidents. Thus, you're judging from the news you hear, which is both an atypical and small sampling. The National Safety Council calculated the odds of dying in a motor vehicle accident as one chance in 98 over a lifetime. The odds for dying in air travel (including private flights) was one chance in 7,178.³

Tip: Notice the sample size and where it's drawn from. Is it adequate to warrant the conclusion? Is the conclusion stated in terms that are too general and sweeping?

Inconsistency

aka "non contradiction." The argument contradicts itself. (See the previous chapter for a more thorough explanation.)

Example: "Only statements that can be justified with scientific experiments can be believed." Yet, this statement itself can't be justified by scientific experiments.

Example: "Our brains developed, not to think logically, but for survival in an agrarian society. Therefore, we can't trust our reasoning." This statement uses logical reasoning, although it's claiming logical reasoning is not to be trusted.

Moral Equivalency

arguing incorrectly that two moral issues are sufficiently similar to warrant the same treatment. It often compares lesser misdeeds to major atrocities.



Example: "Killing in war is legalized murder." In some instances, this may be true. But in all instances?

Example: "Our local police act like Nazis—they have no respect for my human right to drive my car like I want."

Non Sequitur

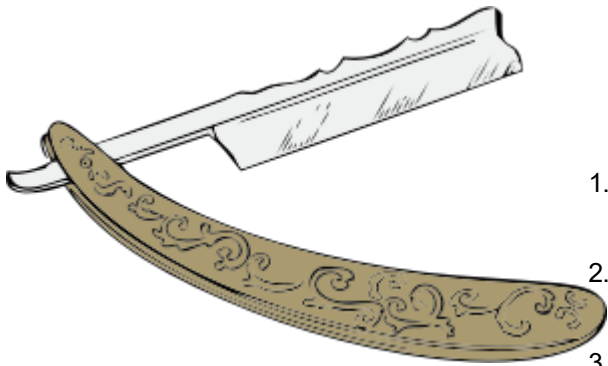
translated: "it does not follow." A general category that includes "hasty generalization," "slippery slope," "affirming the consequent," "missing the point," etc.) The conclusion does not follow from the premises.

Example: "Patrick always smiled at me and was so respectful. He couldn't have burned down the gym." Is there some absolute law of nature that states that respectful, smiling people never burn down gyms? While Patrick's character in relation to you can be a relevant piece of evidence to be considered, it's a *non sequitur* to say that it proves he could have never burned down a gym.

Tips:

1. Forget the conclusion for a moment. Looking solely at the premises, ask yourself what can be concluded from the premises.
2. Now look at your conclusion. Ask yourself what kind and amount of evidence you'd need to support this conclusion. Do the premises provide that kind of evidence?
3. Is your conclusion too extreme? Would it be closer to the truth if it weren't overstated?

Failing Occam's Razor



lectures.

Prefer a simpler explanation (or hypothesis) to a more convoluted or complicated one.

Example: Your best friend Ralph flunked Calculus. Possible reasons:

1. If we were to run a psychological profile of both Ralph and his professor, we might find that they have diametrically opposed learning styles, thus making communication extremely difficult.
2. Aliens kept Ralph up all night before both the midterm and final exam, questioning him and keeping him from adequate rest and preparation.
3. Ralph admitted to never doing his homework and seldom attending

Occam's Razor would prefer the third, more simple and obvious explanation.

Warning: Occam's Razor doesn't decide all cases, since many explanations that end up being proven over time are indeed more complicated than their disproven counterparts. Typically, when choosing between competing scientific theories, the best fit with the observable data trumps simplicity. So it's wise to consider Occam's Razor a "rule of thumb" rather than a hard and fast rule.

Post Hoc Ergo Propter Hoc

translated "after this, therefore because of this." Often shortened to "*post hoc*," also called "faulty causality," "faulty cause," "false cause," or "correlation vs. causation"). Correlation and causation are confused in that one event follows another and the former is falsely assumed to be the cause of the latter.

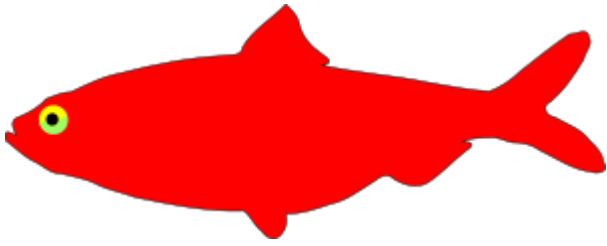
Example: "Ever since his trip to India, Alfred's been sick. Obviously, he caught some-thing in India that our doctors can't diagnose."

Tips:

1. When one event is claimed as the cause of another, look for other possible causes. In the above example, perhaps Alfred caught something the day he arrived back home, or already had an illness before going to India, but never developed symptoms until he returned.
2. Give evidence beyond "this happened after that," to support your claim. For example, you might discover that Alfred consulted with seven American diagnostic specialists, who all agreed that it was a malady they'd never

before seen. This would lend credence to the "he caught it in India" theory.

Red Herring



Deflecting an argument by *chasing a rabbit* (an irrelevant topic.) The name "red herring" was originally used in fox hunting, when a herring (type of fish) was dragged across a trail to throw the dogs off the scent of the fox.

Example: After Harry's wife caught him gambling away his paycheck and asked for an explanation, he responded, "At least with gambling I have a chance to get my money back. What about your weekly purchase of clothes that ends up in a bag for Goodwill?"

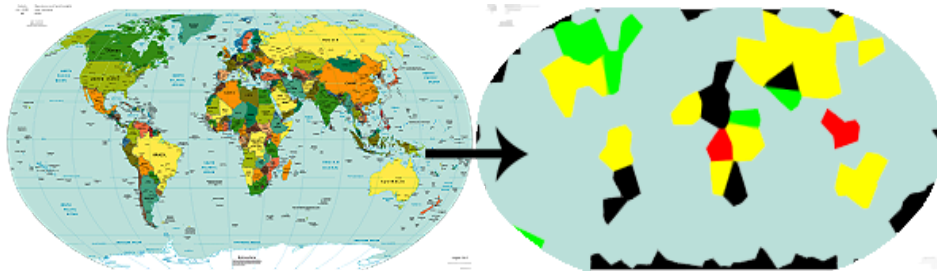
And why isn't your recent raise helping us to pay our debts?"

Harry's arguments deflect from the immediate issue: he gambled away his paycheck.

Example: "Sure, the mercury found in seafood is often unsafe, but fishermen have to make a living like everyone else."

Tip: If you're not sure, write the argument out as a line of argument. This typically shows clearly where the argument got off track.

Reductionism



aka "oversimplifying," "sloganeering." Reducing large, complex problems to one or a few simplistic causes or solutions.

Example: "The problem with our economy can be reduced to two words: trade imbalance." What about other relevant issues, such as the drain of a huge national debt?"

Tip: Ask yourself, "What other factors may contribute to this problem, or be a part of the solution?"

Slippery Slope



aka "snowball argument," "domino theory," "absurd extrapolation," "thin edge of the wedge," "camel's nose." Arguing that one change or event will inevitably lead to another, eventually landing them at a place they never wanted to go.

Example: "If we allow more restrictions on purchasing guns, this will be followed by further restrictions and eventually the government will confiscate all our guns."

Caution: Slippery slopes do exist. The question is, just how slippery is the slope? Is it slippery enough to make the slide to the bottom inevitable?

Tip: Look closely at your argument for each link in the chain of consequences. Is there adequate evidence to conclude that each progression is either inevitable or fairly certain? Are there abundant historical precedents that back up the claim? Are there

historical precedents that provide contrary evidence?

Stacking the Deck



aka "cherry picking." Listing the arguments (or evidence) that support one's claim while ignoring the ones that don't.

Example: "Capitalism inevitably leads to a violent revolution by the proletariat. Here are fifty examples from history."

Tip: Ask yourself, "Are there counterexamples that the arguer is ignoring, or is she/he simply pulling out examples that support his/her theory?"

Straw Man



presents a weak form of an opposing argument, then knocks it down to claim victory.

Example: Jack emailed his professor that he missed class due to a bad case of the flu and that he would bring a doctor's note. The next day, the professor announced in class that he would not excuse Jack's absence because his excuse was that he didn't feel like coming (not mentioning the flu or the note). Since the professor put Jack's argument in such a weak form, he was arguing against a straw man rather than Jack's actual defense.

Tip: Do you know the strongest arguments of your opponents? If so, are those the arguments you're arguing against?

Sweeping Generalization



aka *dicto simpliciter*. Assumes that what is true of the whole will also be true of the part, or that what is true in most instances will be true in all instances.

Example: "All the preppies I know are materialists. Since Shawn dresses preppie, he must be a materialist."

Tip: Particularly when arguers use all inclusive words like "all," "always," "never," "nobody," or "everybody," ask yourself if the premises and/or conclusions should have been presented in less stark terms. Do you know people who dress preppie who don't appear to be materialistic? If so, then perhaps Shawn is a part of the subset of non-materialistic preppies.

Action Points

A Checklist for Spotting Your Own Fallacies

(Ask these questions before turning in a paper, making a speech, or arguing with friends.)

- **How would your opponents respond to your argument?** What parts would they likely attack? Have you actually read the strongest arguments of your opponents and considered their side? Is there a way to strengthen your weak arguments?
- **How would your argument look as a syllogism or line of argument?** Do you have adequate evidence for your premises? Does your conclusion flow logically from your premises?
- **Is your conclusion presented with the degree of certitude that's warranted by the evidence?** (Be especially cautious if you use all-encompassing words like "always," "never," "everyone," etc.)
- **Are there certain types of fallacies that you often fall for?** (Consider how professors responded to your earlier papers or speeches, and how your friends respond to your arguments.)

Flex Your Neurons!

Pursuing the Point of Know Return

Can You Connect an Argument with Its Fallacy?

Making It More Personal
Practical Takeaways

Recommended Trails For the Incurably Curious and Adventurous

1. For each fallacy that's still unclear to you, search it on Google to find more explanations and illustrations.
2. Watch or read some advertisements. Write out their lines of argument or put them in syllogisms. Do any of them fall for one of the above fallacies?

End Notes

Chapter 11: They Fall for Other Common Fallacies

1. I compared lists from 1) the writing center at the University of North Carolina, Chapel Hill, which includes tips for spotting fallacies <http://writingcenter.unc.edu/handouts/fallacies/> 2) the University of Idaho http://www.webpages.uidaho.edu/eng207-td/Logic%20and%20Analysis/most_common_logical_fallacies.htm 3) California State, Fullerton, includes nice, down home examples - <http://commfaculty.fullerton.edu/rgass/fallacy3211.htm> 4) from Purdue University - <https://owl.english.purdue.edu/owl/resource/659/03/> 5) the University of Texas , El Paso - <http://utminers.utep.edu/omwilliamson/ENGL1311/fallacies.htm> 6) Carson Newman, helpful for its division by categories - http://web.cn.edu/kwheeler/fallacies_list.html 7) the University of Louisiana , Lafayette, gives documented examples - <http://www.ucs.louisiana.edu/~kak7409/Fallacies.html> 8) Mesa Community College - <http://www.mesacc.edu/~paoih30491/ArgumentsFallaciesQ.html> 9) California State - <http://www.csus.edu/indiv/g/gaskilld/criticalthinking/Six%20Common%20Fallacies.htm> 10) Sacramento State University 11) the University of Wisconsin, Eau Claire <http://www.uwec.edu/ranowlan/logical%20fallacies.html> 12) St. Lawrence University 13) the University of Oklahoma 14) North Kentucky University. It's interesting that some of these universities use contradictory definitions of various fallacies.
2. Bertrand Russell demonstrated this tendency. He seemed to relish standing against the majority opinion. A person with his disposition should strongly consider that his assessment of evidence might be skewed by this character trait. See chapter 25 for an analysis of the passions that drove Russell.
3. <http://traveltips.usatoday.com/air-travel-safer-car-travel-1581.html>.