6 Relevance (Red Herring) Fallacies

Students will learn to . . .

1. Define and recognize *argumentum ad hominem* fallacies
2. Define and recognize straw man fallacies
3. Define and recognize false dilemma fallacies
4. Define and recognize fallacies involved in misplacing the burden of proof
5. Define and recognize fallacies involved in begging the question
6. Define and recognize fallacies classified as appeals to emotion
7. Define and recognize other fallacies involved in arriving at irrelevant conclusions

Time now to talk about fallacies.

A **fallacy** is a mistake in reasoning, an argument that doesn't really support or prove the contention it is supposed to support or prove. Here is an example of a fallacy:

> You tell me it's dangerous to text when I'm driving, but I have seen you doing it.

The speaker is dismissing someone's claim that it's dangerous to drive and text. However, the fact that the other person texts while he or she drives has no bearing on whether texting while driving is dangerous. This argument is a fallacy—a mistake in reasoning. It is also an example of a **relevance fallacy** because its premise (I have seen you doing it) is not relevant to the issue in question (whether texting while driving is dangerous).

The fallacies we discuss in this chapter are all relevance fallacies. A relevance fallacy's premise may seem relevant and may resonate psychologically, but it isn't relevant.

Relevance fallacies are also called **red herrings.** A herring is a smelly fish that, if dragged across the trail a hound is tracking, might lead the hound on a wild goose chase; the fish is merely a distracting irrelevancy.

In this chapter, we will look at the most common red herrings (relevance fallacies).

ARGUMENTUM AD HOMINEM

The example just given about texting is a relevance fallacy (or red herring) known as an ***Argumentum Ad Hominem*** (pronounced the way it is spelled). This type of argument is the most common fallacy on planet Earth. The name translates as "argument to the person." You commit this fallacy if you think you dismiss someone's *position* (idea, proposal, claim, argument, etc.) by dismissing *him* or *her*. Take the example about texting and driving. Recall what was going on: the issue was whether it is dangerous to text and drive. But instead of discussing the other person's position on the issue, the speaker (the person committing the fallacy) started talking about *the other person*. The speaker's argument was directed at *the person (ad hominem),* not at what the other person said.

Let's modify that example slightly:

> Not only have I seen you drive and text, but just last week you were saying it isn't dangerous to do that.

This too is an *argumentum ad hominem*. Instead of addressing whether it is dangerous to text, the speaker (the person committing the fallacy) is still talking about

the other person, apparently thinking that the fact the individual has changed positions on the issue somehow nullifies what he or she said. You might wonder how anyone could reason this way, but you hear this type of argument all the time. Accusations of doing a "flip-flop" are standard in political campaigns, despite the fact that a person's being inconsistent or changing his or her mind has no bearing on the wisdom of his or her position either now or at any other time.

Here is a different kind of example of *argumentum ad hominem:*

> What do I think about the president's proposal for immigration reform? It's ridiculous. He just wants Latino votes.

The speaker is just bad-mouthing the president, which doesn't tell us anything at all about the strengths or weaknesses of the president's proposal. If the speaker wants to show that the president's proposal is ridiculous, the speaker had better talk about the proposal.

Another slightly different example:

> You can forget what Father Hennessey said about the dangers of abortion, because Father Hennessey is a priest and priests are required to hold such views.

The speaker in this example isn't exactly bad-mouthing Father Hennessey, but he or she still isn't talking about what Father Hennessey said. Instead, he or she is talking about Hennessey's circumstances (being a priest). If someone gave you this argument, you wouldn't have the faintest idea what Father Hennessey actually thinks the dangers of abortion are, let alone what is wrong with his thinking.

To repeat, the *argumentum ad hominem* fallacy occurs when someone attempts to dismiss another person's position on an issue by discussing the person, and not by discussing the issue or that person's position on it. The person committing the fallacy might discuss the other individual's circumstances, character, motivation, lack of consistency, or any number of other attributes, but he or she hasn't really commented on the strengths or weaknesses of the other individual's *position*.

We've arrived at a point where the President of the United States is going to lead a war on traditional marriage.

—Rush Limbaugh, on President Obama's endorsement of gay marriage (Limbaugh's first, second, third, and fourth wives could not be reached for comment.)

The comment about the wives is a humorous *argumentum ad hominem* dismissal by About.com of something Rush Limbaugh said. See the Political Humor section of About.com.

Poisoning the Well

Speakers and writers sometimes try to get us to dismiss what someone is *going* to say by talking about the person's consistency or character or circumstances. This is known as **Poisoning the Well.** An example:

> You can forget what Father Hennessey will say this evening about abortion, because Father Hennessey is a priest and priests are required to think that abortion is a mortal sin.

As you can see, this is like the previous example about Father Hennessey, except in this example Father Hennessey hasn't said anything yet. The person who made the previous statement is poisoning the well, hoping we are not thinking critically and will dismiss whatever Father Hennessey says when he does speak.

> Could somebody please show me one hospital built by a dolphin? Could somebody show me one highway built by a dolphin? Could someone show me one automobile invented by a dolphin?
> —Rush Limbaugh, responding to *The New York Times* claim that dolphins' behavior and large brains suggest they are as intelligent as human beings.
> **Good point. Anyone know of a hospital or highway built by Rush Limbaugh or an automobile invented by him?**
> **(The "good point" comment is an *argumentum ad hominem* on our part. We couldn't resist.)**

Guilt by Association

Outside the logic classroom, the phrase "guilt by association" refers to the concept that a person is judged by the company he or she keeps. For example, if you hang out with unsavory people, then others may think that you too have unsavory qualities. We, however, mean something different by the phrase "guilt by association." We use the phrase to denote a very common version of the *argumentum ad hominem*. The fallacy **Guilt by Association** occurs when a speaker or writer tries to persuade us to dismiss a belief by telling us that someone we don't like has that belief. For example:

> You think waterboarding is torture? That sounds like something these left-wing college professors would say.

The speaker wants listeners to dismiss the idea that waterboarding is torture. So he or she tries to taint that idea by associating it with "left-wing college professors," people he or she thinks listeners don't like or trust. The argument isn't a

straightforward *argumentum ad hominem,* because the speaker doesn't imply that "left-wing college professors" came up with the idea that waterboarding is torture. He or she is just saying that they likely have that idea. The fact that the idea is *associated* with such people is offered as a reason for dismissing it. The belief is "guilty" by virtue of its alleged association with supposedly left-wing college professors.

Genetic Fallacy

One other version of the *argumentum ad hominem* deserves your attention. It's known as the **Genetic Fallacy.** A speaker or writer commits this fallacy when he or she argues that the origin of a contention in and of itself automatically renders it false. Here are two examples:

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> That idea is absurd. It's just something the Tea Party put out there.

> Where on earth did you hear that? On talk radio?

As you can see, both examples imply that a view should be rejected simply because of its origin (genesis).

Here's another example of the genetic fallacy:

> God is just an idea people came up with way back before they had science.

The speaker is dismissing the idea of God because of its origin.

STRAW MAN

The **Straw Man** fallacy occurs when a speaker or writer attempts to dismiss a contention by distorting or misrepresenting it. Here's an example of the straw man fallacy:

> What do I think about outlawing large ammunition clips? I think the idea of disarming everyone is ridiculous and dangerous.

As you can see, the speaker has turned the proposal to outlaw large ammunition clips into something far different, a proposal to disarm everyone. He has set up a straw man (one that is easy to knock over).

The straw man fallacy is almost as common as the *argumentum ad hominem*. Here is another example of the straw man fallacy:

YOU: I think we should legalize medical marijuana.
YOUR FRIEND: Maybe you think everyone should go around stoned, but I think that's absurd.

Your Friend has transformed your position into one that nobody would accept. Another example:

CONSERVATIVE: It would be bad for the economy to tighten emission standards for sulfur dioxide.
PROGRESSIVE: How can you say that? Having more sulfur dioxide in the atmosphere is the last thing we need!

Conservative never said she wanted *more* sulfur dioxide in the atmosphere; Progressive is putting words into her mouth. He has misstated her position.

Whereas an *argumentum ad hominem* attempts to dismiss a claim on the basis of irrelevant considerations about the person making it, the straw man fallacy attempts to dismiss a claim by misrepresenting it.

FALSE DILEMMA (IGNORING OTHER ALTERNATIVES)

The **False Dilemma** fallacy happens when someone tries to establish a conclusion by offering it as the only alternative to something we will find unacceptable, unattainable, or implausible.

We either eliminate Social Security or the country will go bankrupt. Therefore, we must eliminate Social Security.

This is a fallacy. The speaker doesn't present all the options. He ignores, for example, the alternative of cutting something other than Social Security, or raising the age of eligibility, or having better off earners pay more into the system.

Here is another example:

Either we allow the oil companies to drill for oil in the Gulf or we will be at the mercy of OPEC. Therefore, we shouldn't prevent the oil companies from drilling for oil in the Gulf.

This is a false dilemma. The speaker thinks oil companies should be free to drill in the Gulf, and tries to support his position by pretending that it's either that or be at the

mercy of OPEC, an alternative he assumes we will find unacceptable. The speaker ignores other options. Saving fuel might be one. Getting oil from shale is another. Going solar is possibly a third. Maybe you can think of others.

Here is another example. A man says to his spouse:

> "Look, either we clean out the garage, or this junk will run us out of house and home."

The man is pretending the only alternative to cleaning out the garage is being run out of house and home, an unacceptable alternative. He has ignored other options, such as not acquiring more junk.

Which Do You Want in Your Backyard?

This?

Or this!

We've seen flyers advocating a position on a zoning-law proposal that imply we must choose between settings like these. Vote one way, you get a lush creek in your backyard; vote the other, you get a pig farm. We're pretty sure there are other alternatives.

The false dilemma fallacy is often referred to as the black/white fallacy, the either/or fallacy, the false choice fallacy, and the false alternative fallacy. Perhaps the best name would be "ignoring other options," but unfortunately that name hasn't caught on.

The Perfectionist Fallacy

Two false dilemma arguments are so common that they have their own names. One is called the **Perfectionist Fallacy.** The fallacy is committed when a speaker or writer ignores options between "perfection" and "nothing." Here's an example:

> A single English course won't make anyone a great writer, so I don't see why we have to take one.

The speaker has presented us with a perfectionist fallacy. He has restricted our options. He is arguing that unless a single English course can make us great writers ("perfection"), we shouldn't have to take one at all. He has ignored the possibility that a single English course might make us *better* writers.

Here is another example of the perfectionist fallacy:

> Drilling for oil in the Gulf won't give us independence from OPEC; therefore, we shouldn't drill.

Unlike the speaker in the previous oil drilling example, this speaker tries to establish that we should *not* drill in the Gulf. She gives us a perfectionist fallacy, because she ignores the less-than-perfect possibility that drilling for oil in the Gulf could make us *less* dependent on OPEC.

The Line-Drawing Fallacy

The other version of the false dilemma fallacy is the **Line-Drawing Fallacy.** This fallacy occurs when a speaker or writer assumes that either a crystal-clear line can be drawn between two things, or else there is no difference between them. Here is an example:

> It doesn't make sense to say that someone is rich. After all, nobody can say just how much money a person has to have in order to be "rich."

The speaker has assumed that, if we cannot say *exactly* how many dollars a person must have in order to be rich, then we can never say that person is rich. But he ignores the fact that there are obvious cases of rich people as well as people who are not rich. An imprecise line between the two is still useful.

Here is another example of the line-drawing version of the false dilemma fallacy—a person trying to argue that video games are not excessively violent:

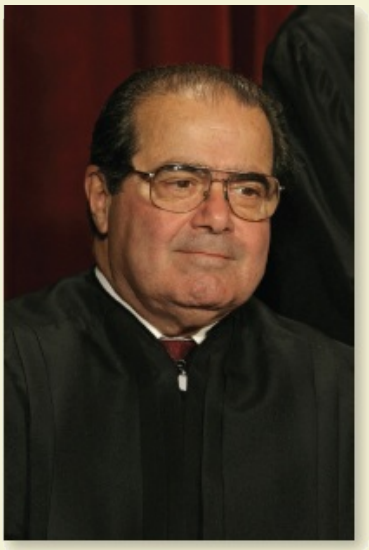
> You can't say exactly when a videogame is too violent; therefore, no videogame is too violent.

The speaker has restricted our options to either being able to draw a *clear* line

between violent and nonviolent videos (which is implausible to think could be done), or not making a distinction between them. He has ignored the possibility that an imprecise line can be drawn and that it might have some value in assessing level of violence.

Antonin Scalia Uses the Line-Drawing Fallacy

Antonin Scalia was a justice on the United States Supreme Court until his death in early 2016. Attorney Theodore B. Olson represented those who sought to have the Supreme Court rule that California's Proposition 8, which banned gay marriage, is unconstitutional. The following is from the oral arguments made before the U. S. Supreme Court on Proposition 8.



SCALIA: When did it become constitutional [When did gays have a constitutional right to marry?]?

OLSON: When we as a culture determined that sexual orientation is a characteristic that individuals cannot control.

SCALIA: I see. When did that happen? When did that happen?

OLSON: There is no specific date in time.

SCALIA: How am I supposed to know how to decide the case then?

MISPLACING THE BURDEN OF PROOF

If your doctor says you are infected with West Nile virus, you will say, "Doctor, what makes you think that?" If she says, "What makes you think you aren't?" you will get a new doctor. Her remark is absurd because it is *her* job to tell you why she thinks you are infected with West Nile, not *your* job to tell her why you think you aren't.

As in this case, sometimes the burden of proof clearly falls more heavily on one side than another. When people try to support or prove their position by misplacing the burden of proof, they commit the fallacy called **Misplacing the Burden of Proof.** Here is a less far-fetched example:

> I believe our former president's birth certificate was a forgery. Can you prove it isn't?

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The burden of proof is on the speaker to give us a reason for thinking the birth certificate was forged, and he or she has tried to transfer the burden to the listener. Why is the burden of proof on the speaker? Because forging a birth certificate is the exception rather than the rule. If everyone normally forged his or her birth certificate, then it would be common to want proof that one *wasn't* forged. But in the real world, forging a birth certificate is rare, so the person who makes the accusation has the burden of proof.

Another example:

> Guns should be outlawed. I'll bet you can't think of a single good reason they shouldn't.

The speaker has incorrectly shifted the burden of proof to the listener. In the United States, the Constitution is interpreted as giving people the right to own a gun, so the burden of proof is on the speaker to explain why the right should be removed.

Sometimes you have to be on your toes to spot the fallacy. Here is an example:

> JILL: We should invest more money in expanding the interstate highway system.
>
> ALICE: That would be a mistake.
>
> JILL: How could anyone object to more highways?

With her last remark, Jill has tried to put the burden of proof on Alice. This tactic can put Alice in a defensive position, if she takes the bait. Alice may think she must

show why we should not spend more on highways, when in fact it is Jill who has the burden of proof. We don't even know whether Alice is against more highways; she might think we shouldn't be spending any money because of budget problems.

Which side has the burden of proof often depends on context, but speaking generally, if the issue is a factual one, the side making the more outlandish claim (the claim having the lowest initial credibility) has the burden of proof. Also, other things being equal, the burden of proof falls on the person who wants to change something, rather than on the person who wants to leave things alone. That was the case in the last two examples. Of course, in a criminal court, the burden of proof always falls on the prosecution. The defense is not required to prove innocence: it must only try to keep the prosecution from succeeding in its attempt to prove guilt. This is what is meant by the phrase "Innocent until proved guilty."

When someone asserts that we should believe a claim because nobody has proved it false, the fallacy is a version of misplacing the burden of proof known as **Appeal to Ignorance.** Here is an example:

> Nobody has proved ghosts don't exist; therefore they do.

This is a fallacy because proof requires more than an absence of disproof.

Here is our recommendation: Be suspicious when somebody regards your inability to disprove his or her position as evidence for it. Take note of where the burden of proof falls in such situations; your speaker may be trying erroneously to place that burden on you.

Shifty Sales Strategies

BEGGING THE QUESTION (ASSUMING WHAT YOU ARE TRYING TO PROVE)

In everyday language, to *beg* the question has lately come to mean simply to *raise* the question. Traditionally, and in logic, **Begging the Question** means something else. A speaker or writer is guilty of begging the question logically when he or she tries to "support" a contention by offering as "evidence" what amounts to a repackaging of the

very contention in question.

Here is an example:

> Obviously the governor told the truth about the budget. He wouldn't lie to us about it.

In essence, the reason given here for believing the governor is that he wouldn't lie. This isn't *exactly* the same thing, but it is so close that it could not really be counted as evidence. If we aren't sure the governor told the truth, we can't be sure he wouldn't lie.

If an argument is of such a nature that a person who disputes its conclusion logically must also dispute its premise, then it begs the question. The classic example of begging the question is this:

> That God exists is proved by scripture, because scripture is the word of God and thus cannot be false.

If someone disputes that God exists, then he or she must also dispute that anything is the word of God.

Here is another example:

> Women should not be allowed in combat, because it is prohibited by the Defense Department.

This is merely saying that something shouldn't be allowed because it isn't, which does not explain why it shouldn't.

Often loaded questions (discussed as rhetorical devices in **Chapter 5**) beg the question. This dialogue will serve as an example:

> BILL: Do Republicans hate women because they are angry white males? Yes or no.
>
> JILL: Uhhhhhh...
>
> BILL: Well?

Bill hasn't given a legitimate argument for his belief that Republicans hate women. He has simply asked a question which assumes that very point. He is just smuggling his belief into his question—which amounts to trying to establish something simply by assuming it.

The idea behind [talk radio] is to keep the base riled.
—Republican political adviser Brent Lauder, explaining what talk radio is for

APPEAL TO EMOTION

When a speaker or writer "supports" a contention by playing on our emotions rather than by producing a real argument, the result is the fallacy called an **Appeal to Emotion.** This can happen in various ways depending on the specific emotion involved. We will explain the most common varieties of this fallacy.

Argument from Outrage

The **Argument from Outrage** attempts to convince us by making us angry rather than by giving us a relevant argument. Here is an example:

> Do you think Apple doesn't know it hires 12-year-old children to make its electronics? You think it isn't aware it pays them slave wages and has them work in buildings without heat or air conditioning? It knows. Apple products can't be any good.

The passage doesn't support the contention that Apple products aren't any good. Rather, it tries to *induce* us to have that belief by making us angry.

Here is another example:

> You expect me to believe BP cleaned up its mess in the Gulf? Just look at those ads it runs, trying to make it sound like everything is beautiful and even better than before. Does the company take us for fools?

This argument has no probative weight. It tries to persuade us that BP hasn't cleaned up its mess, by making us indignant, rather than by proving or supporting.

The argument from outrage occurs frequently in political contexts, where the conclusion is often just implied that we should vote against someone or something.

Scare Tactics

The **Scare Tactics** fallacy occurs when a speaker or writer tries to scare us into accepting an irrelevant conclusion.

Here is an example:

> You really should get a Prudential life insurance policy. What would happen to your spouse and children if you die? Remember, you are their main source of income. Would they be forced to move?

This argument tries to scare you into buying a Prudential life insurance policy. But even if it is true that your spouse and children will be forced to move if you die, that is no reason to favor insurance from this particular company.

Threats too, if they substitute for argument, are regarded as scare tactics. Here is an example:

> Gavin Newsom would make a terrible governor. Do you seriously think I could be interested in being your girlfriend if you vote for him?

The speaker hasn't said a thing to support the idea that Gavin Newsom would make a terrible governor. She is just threatening the other person. Obviously, if a speaker issues a credible threat, it would not be a fallacy to protect yourself. "If you vote for Newsom, I will shoot your dog" would be a compelling reason for not voting for Newsom, if the speaker actually would carry out the threat. But no threat to you is related to whether Newsom would make a terrible governor.

One final example of a scare tactic:

> Obviously the federal government must cut spending. You agree with the rest of us on that, I assume.

The speaker hasn't given the listener a reason for cutting government spending. He or she is simply trying to make the listener fear being made an outcast. This is sometimes called the **Peer Pressure Fallacy.**

Scare Tactics versus Fear Mongering

Speakers and writers often make inflammatory or scary statements just to rile people up or frighten them, without pretending that the statements support a specific conclusion. When that happens, it's just fear or hate mongering, as discussed in **Chapter 5**. Here, for example, is a famous fear-mongering statement from Joseph McCarthy, the U.S. senator from Wisconsin in the 1950s who furthered his own political objectives by alarming people with false accusations of treason and communism.

> I have here in my hand a list of two hundred and five people that were known to the Secretary of State as being members of the Communist Party and who nevertheless are still working and shaping the policy of the State Department.

The statement wasn't offered with any specific "conclusion." So you can't really call it an argument or a fallacy. It's just scary rhetoric about Communists infiltrating the government. Obviously there is a fine line between the scare tactic fallacy and fear mongering, and between the argument from outrage and hate mongering. If there is no specific conclusion stated or implied, then you can call it fear or hate mongering.

Appeal to Pity

The **Appeal to Pity** fallacy occurs when a speaker or writer tries to convince us of something by arousing our pity rather than by giving a relevant argument. Here is an example:

Jane is the best qualified candidate: after all, she is out of work and desperately needs a job.

The speaker has not given a reason for thinking that Jane is the best qualified candidate; he or she is just tugging on our heartstrings.

Other Appeals to Emotion

Emotions other than fear, anger, and pity are used to manipulate an audience into believing or doing something. Instead of providing actual support for a claim, a speaker or writer may issue remarks designed to make us feel envious or jealous, proud, guilty, or anything else, in the hope that we will then accept the claim. These other "arguments" have names—playing on our pride is called **Apple Polishing,** trying to make us feel guilty is referred to as **Guilt Tripping,** arousing envy is called **Appeal to Envy,** and playing on someone's jealousy is called **Appeal to Jealousy.** What these and the other appeals to emotion all have in common is that they actually are pieces of *persuasion* masquerading as arguments.

Guns aren't arguments, but that hardly means you should ignore what an armed man tells you to do.

This brings up the final and very important point about appeals to emotion. Considerations that *truly support* a contention often arouse our emotions. So you cannot conclude, just because someone appears to be trying to scare you or make you angry, or feel some other way, that he or she has committed a fallacy. If he or she offers evidence having probative value, then it is a mistake to consider the argument a fallacy. Here is an example of a legitimate (no fallacy) argument that might arouse a listener's pity.

You should let that dog out of your car, because it is suffering from heat and thirst and will die very soon if you don't.

This is *not* the appeal to pity fallacy or any other kind of fallacy. The speaker has given us an excellent reason for letting the dog out of our car.

And here is an example of a legitimate (no fallacy) argument that might arouse a listener's fear:

> You should not drive on the 50 tonight. It is icy and dangerous and you could get killed.

This is *not* scare tactics or any other kind of fallacy. Dangerous conditions on a road are relevant to whether we should drive on it. Look very carefully at what speakers and writers say before concluding that a fallacy has been committed. Seeing "fallacies" where none are present is also a breakdown in critical thinking.

- Scare tactics? Not really. The ad is actually aimed at reducing one's fear.

IRRELEVANT CONCLUSION

Relevance fallacies that do not fit comfortably into the above categories may be said to commit the fallacy of **Irrelevant Conclusion.** Here is an example from a student talking to a professor:

> I don't think I missed too many classes to pass. My attendance has been much better lately.

An improvement in attendance doesn't show you didn't miss too many classes to pass.

Here is a car salesperson:

> This new Honda gets better mileage than any other car in its class. After all, Honda

has completely redesigned the engine.

Hooray; good for Honda. Now let's hear figures on mileage.

A similar example is as follows:

Fracking* won't hurt the water around here. Don't you know that we have invested millions in safety controls?

Perhaps the speaker's company deserves kudos for its safety controls, but we haven't been given evidence that the controls work at all, let alone perfectly.

This is a different sort of example:

Why should I tell them they undercharged me? You think they would say something if they overcharged me?

The speaker is trying to justify not doing anything about having been undercharged. However, the fact that they (whoever they are) wouldn't inform him of an overcharge (assuming it is even true that they wouldn't) only supports a negative appraisal of *their* ethics, not a positive appraisal of *his*. This is an example of the fallacy **Two Wrongs Make a Right.**

Two other common irrelevant conclusion fallacies are **Wishful Thinking** and **Denial.** Wishful thinking happens when we forget that wanting something to be true is irrelevant to whether it is true. Denial happens when we forget that wanting something to be false is irrelevant to whether it is false. The two fallacies are flip sides of the same thing, of course.

Here is an example of wishful thinking:

I really really hope I will be the next American Idol. Therefore, I'm sure I will be.

Did *American Idol* contestants really think this? Some at any rate seemed stunned when they were eliminated.

Here is an example of denial:

I'm *positive* I didn't miss class as many times as the professor says and the records show! I just know it!!!

Being "in denial" about the likely consequences of harmful behavior—smoking,

eating poorly, drinking excessively, and so forth—does not seem uncommon.

Ducking with Irrelevancies

David Muir (*of ABC News*): Does Carfax report the entire history of the car?
Larry Gamache (Carfax communications director): Yes, we give people the entire Carfax history.
David Muir: Is that the entire history of the car?
Larry Gamache: You can't give the entire history of anything.

David Muir, of ABC News

Sometimes irrelevancies are introduced into a discussion when someone attacks a counterargument *to* his or her position rather than offering an argument *for* that position. Here is an example:

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> Republicans hated Obama due to their racist attitudes. If the polls didn't show it, it's because people lie.

The speaker here hasn't supported the assertion that Republicans hated Obama because they are racist. Rather than produce evidence to support this assertion, he or she claims that people lied to pollsters. This is logically irrelevant at this point in the discussion.

Recap

The fallacies in this chapter are relevance fallacies—arguments that may seem

relevant to their conclusion but logically are not. We specifically examined the following:

- *Argumentum ad hominem*—attempting to dismiss a source's position by discussing the source rather than the position
- Straw man—attempting to dismiss a source's position by misrepresenting it
- False dilemma—attempting to establish a point by pretending it is the only alternative to something we will find unacceptable, unattainable, or implausible
- Misplacing the burden of proof—attempting to place the burden of proof on the wrong side of an issue
- Begging the question—attempting to "support" a contention by offering as "evidence" what amounts to a repackaging of the very contention in question
- Appeal to emotion—attempting to "support" a contention by playing on our emotions rather than by producing a real argument
- Irrelevant conclusion—relevance fallacies that do not fit into the previous categories

EXERCISES

Here are 100 examples of the fallacies discussed in this chapter.* Match each item to one or more of the following categories:

a. *argumentum ad hominem*
b. straw man
c. false dilemma
d. misplacing the burden of proof
e. begging the question
f. appeal to emotion
g. irrelevant conclusion

Notes

- Some items arguably fall into more than one category; this is true in real life as well. But no item in this list could plausibly be said to fall into every category. Your instructor will tell you if your categorization is too much of a stretch.
- Your instructor may or may not ask you to further match instances of *argumentum ad hominem* to one or another of these categories:

a. Arguments that dismiss a source's position because of the source's alleged hypocrisy or inconsistency (inconsistency *ad hominem*)

b. Arguments that dismiss a source's position because of other alleged deficiencies on the part of the source (personal attack or abusive *ad hominem*)

c. Arguments that dismiss a source's position because of the source's circumstances (circumstantial *ad hominem*)

d. Arguments that dismiss a source's position before the source has presented it (poisoning the well)

e. Arguments that dismiss a claim by associating it with someone we are assumed to despise (guilt by association)

f. Arguing that the source of a contention in and of itself renders it false (genetic fallacy)

- Your instructor may also ask you to identify any examples of perfectionist or line-drawing versions of the false dilemma fallacy.
- Finally, your instructor may ask you to identify specific emotional appeals, including argument from outrage, appeal to pity, and scare tactics.

▲ 1. Save your money. Nothing will make your teeth perfectly white.

2. Jane complains because she doesn't like the way I clean. Of course, she wants to be able to eat off the floor.

3. Don't read *The New York Times.* It's filled with liberal propaganda.

4. Limbaugh! That pompous windbag. You can't believe what he says about climate science.

▲ 5. If you don't support same-sex marriage, then you are a homophobe who hates gays.

6. It isn't *guns* that need controlling. It's *people* who need controlling! *Guns* don't kill people; *people* kill people! I get furious when I hear people miss this point!

7. **SKEPTIC:** Why is Genesis the only acceptable account of how the world came to be?

   BELIEVER: Show me an explanation that makes more sense.

8. The prices at Starbucks? A rip-off. I get better coffee at McDonald's.

9. I'm telling you, something was holding me in bed in the middle of the night. I didn't see or hear anything, but there were hands—or something—on my chest and stomach pushing me into the bed. You can't convince me it wasn't something supernatural doing it.

▲ 10. Acid indigestion, if untreated, might burn a hole in your stomach lining. Get Pepcid AC.

11. Not picking up after your dog is unsanitary, since it is so unhygienic.

12. Baking powder is toxic. How could you doubt that?

13. We have every right to be late on the rent! Management won't fix anything. The toilet is leaking and the doorbell doesn't work. They won't even let us paint or keep a pet!

14. Don't you get sick and tired of hearing her brag? I'll bet she expects us to believe her, too.

▲ 15. BILL: Students these days are lazy and shiftless. They don't care about learning.

JILL: Are you just saying that, or do you have evidence?

BILL: Well, remember how hard we worked when we were students?

16. Portman says we ought to allow gays to marry, but he wouldn't say that if his son weren't gay.

17. Obama did an excellent job, when you consider how the Republicans tried to destroy him with endless attacks and *ad hominem* arguments.

18. Their proposal is 90 percent predictable, and 90 percent bad for the country. But what would you expect, coming from Republicans.

19. BILL: Space aliens are real.

JILL: Oh, Bill, how can you say such a thing?

BILL: Because only space aliens would have the power to erase all evidence of their existence.

▲ 20. Sure, it sounds good in theory, but curbing violence in movies doesn't make sense. It's crazy to think they should only make movies for kids.

21. If you don't align yourself a little better with conservatism you might find yourself facing a challenge come next primary. Just saying.

22. He wants to lower the drinking age? Forget about that. He owns a liquor store.

23. ANTI-GUN PERSON: Most homicides are committed with guns that were originally purchased legally.

GUN PERSON: Where did you hear that?

ANTI-GUN PERSON: Where did you hear they weren't?

24. How could God have created the world if God didn't exist?

▲ 25. Sure, a cruise would be nice, but we can't spend every last cent on vacations.

26. Honey, you are so understanding. Would you do the dishes this once?

27. The Democrats say they want the government to help all Americans. Translation: They want the government to run everything.

28. High-speed rail travel between here and St. Louis is something we should support, unless you can explain to me why we shouldn't.

29. Vote for the new parking garage! If we don't build it, people will have no place to park.

▲ 30. "You can't believe in all three religions, because that is the same as not believing in any of them."

—The Life of Pi

31. Don't bother listening. He's just going to give us a bunch of emotional garbage.

32. Look out there. See those people bent over those vegetables? Know how hot it is out there? Know how many hours they put in? And are you aware that they have a special minimum wage, lower than anyone else's? Are you still going to say they take jobs away from citizens?

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33. He wants to lower the drinking age? Since he is eighteen, I'm not surprised.

34. You see what the vandals did to Sharp's store over across the street? You need protection from that. You need to buy a little "security insurance" from us, you know what I'm saying?

▲ 35. Public schools are unfixable. Prove me wrong.

36. You can't possibly think pot is good for you, in view of how harmful it is.

37. The city council says the city needs a sales tax, but I don't buy it. Look at all the stuff they force down our throat—like, no plastic bags. Why, we can't even cut down the trees in our own backyards. They are after our hard-earned money and want to spend it on art projects and other so-called civic enhancements.

38. Your mom doesn't even own a cell, and you listen to her when she tells you not to text and drive?

39. We have been very frugal of late, so it is time to get a new car.

▲ 40. Staring at the sun will hurt your eyes. If it weren't for that, you could try it

yourself and find out.

41. That's ridiculous. Sounds like something Nancy Pelosi would say.
42. "Wholistic" or "holistic," it doesn't matter. The guy talking tonight probably believes in crystals and pyramids. Totally New Age. I wouldn't even go, let alone listen.
43. **FIRST GUY:** I'm going to buy a new Mazda.

    SECOND GUY: Hey, I think a Honda is a better deal.

    FIRST GUY: What makes you think so?

    SECOND GUY: What makes you think the Mazda is better?
44. The CEO of BlackBerry says iPhones are passé. That's clearly false. He wouldn't say that if he worked for Apple.

▲ 45. The Republican budget can't be all bad, when you consider the Democrats haven't proposed a budget in years.

46. **JILL:** I think we need a little more accountability in public schools. There should be sanctions for incompetent teachers.

    BILL: Oh I see. Eliminate tenure, huh?
47. Ashley makes me so mad! Who does she think she is, trying to tell me what I can do. If I want to play music loud, that's my right!
48. Honey, I invested our savings in equities. I didn't want to lose it all to inflation.
49. We don't need to drill in the Santa Barbara Channel. It won't solve our fuel problems, and the ugly rigs will ruin the beauty of our pristine coast.

▲ 50. This pamphlet is put out by the people who have been trying to suppress minority voters. You won't find a word of truth in it.

51. You can't believe that! That's the kind of stuff you hear on Fox.
52. **JILL:** I see that the editor of the newspaper is going to retire, which is a good thing, because he has caused a lot of trouble for the Downtown Business Association.

    BILL: I don't know about that. The paper has made a lot of money under his editorship.

53. We must honor the agreement, because it binds us.
54. Are you saying Candace's voice is better than Amber's? I disagree. You have to factor in how Amber went through so many hardships—illness, abandoned as a child. . . . Candace didn't face anything like that.

▲ 55. What, more shoes? C'mon, nobody needs a thousand pairs of shoes!

56. Bombing the despot's airports won't bring his reign to an end, so why do it?

57. Tell me this. If you aren't losing your hearing, then how come you can't hear so well?

58. Do I agree with Rand's brand of conservatism? Not entirely. He isn't doing himself any favors by pushing those ideas.

59. He wants to raise the drinking age? Are you going to accept that coming from him? Isn't he the very same person who thinks we should legalize pot?

▲ 60. You know, when you say things like that, I think you've been hanging out with the Sierra Club or something.

61. Class, when you fill out these student evaluations, I hope you remember how hard I have tried.

62. I used to think Mike Savage made a lot of sense. Then I found out he lied about his background.

63. **SENATOR TED CRUZ:** The question that I would pose to the senior senator from California is: Would she deem it consistent with the Bill of Rights for Congress to engage in the same endeavor that we are contemplating doing with the Second Amendment in the context of the First or Fourth Amendment? Namely, would she consider it constitutional for Congress to specify that the First Amendment shall apply only to the following books and shall not apply to the books that Congress has deemed outside the protection of the Bill of Rights?

SENATOR DIANE FEINSTEIN: I'm not a sixth grader. Senator, I've been on this committee for 20 years. I was a mayor for nine years. I walked in and I saw people shot. I've looked at bodies that have been shot with these weapons. After 20 years, I've been up close and personal to the Constitution. It's fine if you want to lecture me on the Constitution. I appreciate it. Just know I've been here for a long time. I passed on [*sic*] a number of bills. I study the Constitution myself. I am reasonably well educated, and I thank you for the lecture. Incidentally, this does not prohibit—you used the word "prohibit." It exempts 2,271 weapons. Isn't that enough for the people in the United States**?**

64. Estelle claims we should have the kids vaccinated, but that doesn't persuade me, since she works for Amgen or one of those other drug

companies.

▲ 65. Is the EPA trying to ruin the oil industry, or is it just plain incompetent?

66. You want to keep defense spending at current levels? What, you don't think we should be able to defend ourselves even from a place like Iceland?

67. I deserved to pass. I couldn't have missed every question!

68. Either we increase troop strength, or the Taliban will overrun the country.
I know which I would choose.

69. Drink less? And why should I believe that coming from a chain smoker
like you?

▲ 70. Hey, Professor, do you give extra credit? I missed a few classes, but I want to major in English. I love your class!

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71. Pryor's diatribe against gun control is flat-out nonsense. He probably doesn't believe that stuff himself.

72. "Mark Pryor's liberal record is out of touch with Arkansans, and it's time to hold him accountable. Mark Pryor stood with Obama on Obamacare, the failed stimulus, and bailing out the Wall Street banks. While Arkansans have had to balance their checkbooks, Mark Pryor has joined with the liberals in Washington to recklessly spend our tax dollars on the Obama agenda."

—Club for Growth President Chris Chocola

73. "Only $100? Isn't it worth more than that? We really need the money for our daughter's tuition."

—A couple trying to sell a stove on Hardcore Pawn

74. Ladies and gentlemen of the jury, you can't trust this witness. Counsel for the defense has not produced a shred of evidence that he is trustworthy.

▲ 75. Drinking wine is good for you? Where did that idea come from, Gallo?

76. Buy now while supplies last!

77. Forget those polls. They come from CBS.

78. The War on Drugs has been a disaster. It has cost us billions and hasn't reduced drug use at all. Obviously the sane thing is to legalize drugs.

79. That's nuts. That's just something someone like Ayn Rand would

think.

▲ 80. Armed guards in public schools? You think that's a solution to gun violence? That's just something the NRA put out there.

81. Heidegger was a mean, thoughtless, self-serving man—an ex-Nazi. He couldn't have been a great philosopher.

82. I don't like the idea of getting a second pet. We aren't running a zoo.

83. Mold is the leading cause of illness in the home. Schedule an appointment with our technicians now, for peace of mind.

84. Accept Jesus or rot in hell.

▲ 85. Aryan superiority is demonstrated, if a demonstration is even needed, by the manifest inferiority of the other races.

86. He thinks we should outlaw large ammunition clips. I don't buy it at all, coming from him. He also thinks we don't need the police.

87. You can hardly eliminate all carbs from your diet, so there is no point going on a low-carb diet.

88. All right. We have to decide who will be the final boss in this outfit. Clearly, the person who invested the most money ought to have the final say, and I invested the most. Therefore, I should have the final say. And since I have the final say, that's that.

89. The president lied through his teeth all through the debate, and now he expects us to agree with his ideas?

▲ 90. Cutting back on salt doesn't sound like a good idea. A person has to eat some salt, you know.

91. Not many people could appreciate the distinction, but I know it wasn't lost on you.

92. Terry will win the raffle. That girl has worked her fingers off putting this event together! She and her three sick babies deserve it.

93. All this negative publicity has hurt the Boy Scouts. They deserve our support.

94. Jackson is at least a hundred pounds overweight. He has a simple choice: Lose it, or die.

▲ 95. The idea will never work. Of course, the mainstream media like it, but they are known for their liberal bias.

96. Why raise taxes on the richest 3 percent? It would bring in only a fraction of the revenue needed to balance the budget.

97. Professor Stooler assigned two extra paragraphs to read. Dude

thinks we don’t have anything better to do.

98. The tax bill would derail the economic recovery. If you vote for it, many of your supporters might have difficulty contributing to your campaign.

99. He is so full of himself, it’s disgusting. Don’t expect me to agree with him.

▲ 100. She is trustworthy; after all, she swears she is, and you can’t doubt that.

7 Induction Fallacies

Students will learn to . . .

1. Define and recognize fallacies involved in generalizing
2. Define and recognize fallacies involved in arguments based on weak analogies
3. Define and recognize fallacies involved in citing authorities
4. Define and recognize fallacies involved in citing popular beliefs or customs
5. Define and recognize fallacies involved in cause-and-effect claims
6. Define and recognize fallacies involved in slippery slope arguments
7. Define and recognize fallacies involved in arguments based on untestable explanations

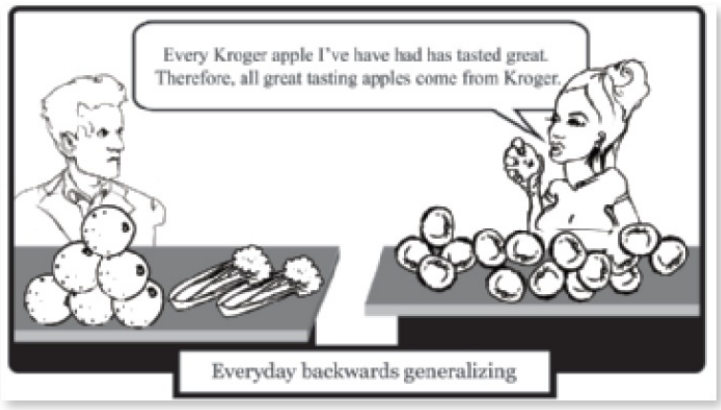
In this chapter we examine common **Fallacies of Induction**—arguments that are supposed to raise the probability of their conclusions, but are so weak as to fail almost entirely to do so. In **Chapter 11** we will discuss the basic principles of inductive reasoning. However, you do not need to read **Chapter 11** to understand the fallacies discussed here.

GENERALIZATIONS

A little background here: General claims (claims that lack specificity) are made by people every second of every day.

Pit bulls bite.
This town is dead.
The food in L.A. is lousy.
My aunt is so mean.
This country is going down the tubes.
Most people believe in God.

However, general statements are often supported by feeble, inadequate reasoning. In this section we look at two important ways this can happen. We also consider the reverse mistake, one that can be involved when we reason from a general statement to a specific case.



Generalizing from Too Few Cases (Hasty Generalization)

Arriving at a general statement or rule by citing too few supporting cases is the fallacy known as **Generalizing from Too Few Cases,** or more commonly, **Hasty Generalization.** Here is an example:

The food in L.A. is lousy, judging from this meal.

Assuming the speaker is dining at a restaurant, he or she has made a sweeping generalization about food sold at restaurants in a very large city, based on his or her experience at one restaurant. This "support" is so weak as to count as nonexistent. The speaker has offered us what might be called a lonely fact; indeed a very appropriate

alternative name for the fallacy of hasty generalization is the **Fallacy of the Lonely Fact.**

Here is another example of hasty generalization:

> The police stopped me for driving five miles over the speed limit. Around here they will stop you for everything.

That you were cited for driving five miles over the speed limit in and of itself is a "lonely fact," insufficient for thinking the police will stop everyone for every infraction.

One version of hasty generalization is known as the **Argument by Anecdote.** An anecdote is a story. When a speaker or writer tries to support a general claim by offering a story, he commits this fallacy. A story is just a single incident. It may carry psychological weight, but it has little logical force. Here is an example of an argument by anecdote:

> Did you read where John Travolta flew his plane into LAX and parked it on the tarmac—right out there in everyone's way? That's the trouble with these Hollywood actors. They don't care about anyone but themselves.

A story about John Travolta is just that—a story about John Travolta. Generalizing from that story to all Hollywood actors is a fallacy.

Here is another example of argument by anecdote:

> They say the unemployment rate is around 8 percent but I don't buy that at all. Anybody who wants a job can get one. You just have to be willing to settle for something less than ideal. When my husband was laid off he didn't sit around crying about it. He got a job with a yard service. It didn't pay much, but you know what? He learned the ropes and now he owns his own yard service and hires several employees.

Often an argument by anecdote is used in the vain hope that it *disproves* a general claim. That is what has happened here. You can't disprove a statement about the unemployment rate by telling a story, no matter how interesting the story is.

Here is another example of an argument by anecdote used to try to disprove a general claim:

> They say the health care is excellent in Canada? Well, it isn't. My new neighbor

just moved here from Toronto, and she says the health care up there is terrible. She says everyone in Canada comes to the United States for any serious medical condition.

The speaker tells us a little story, a factoid. In itself it proves or disproves nothing about overall health care in Canada. (It sounds as if the new neighbor is guilty of her own hasty generalization, too.)

The fallacy of hasty generalization frequently occurs when someone tries to derive a statement about all or most members of a **population** from a statement about a tiny sample of the population. This is sometimes called the **Fallacy of Small Sample.** Here is an example:

People who live in Cincinnati have no idea where Akron is. I didn't, when I lived in Cincinnati.

The speaker provides a solitary piece of evidence for the knowledge level of everyone in Cincinnati. He thinks he has supported a conclusion about a large population by considering a sample consisting of a single person.

Good Reasoning Can Be Based on Small Samples

Generalizations based on small samples are not necessarily fallacies, if the sampled population is known to be homogeneous. For example, if every member of a small random sample of ball bearings had the same defect, and it was known that the ball bearings were all manufactured by the same process, it would not be a fallacy to expect the next ball bearing to have the same defect.

Also, a generalization based on a small random sample from even a nonhomogeneous population is not mistaken if an appropriate error margin or confidence level is built into it. This is discussed in **Chapter 11**.

Here is one final example of the small sample version of hasty generalization:

Things cost less at Costco. I bought lawn fertilizer there for a ridiculously low price.

You can view the items Costco sells as a "population"; lawn fertilizer would then be a "sample" of that population. This argument does offer some support for the general conclusion it reaches, but the support is very weak. Lawn fertilizer might be an isolated case.

Generalizing from Exceptional Cases

Arriving at a general statement or rule by citing an atypical supporting case is the fallacy known as **Generalizing from Exceptional Cases.** Here is an example:

The police aren't required to get a search warrant if they arrest a suspect while a robbery is in progress and search him for a weapon. Therefore, they shouldn't be required to get a search warrant for any kind of search.

The speaker is generalizing about all police searches, from a premise about searches in exceptional circumstances.

Here is another example of generalizing from exceptional cases:

Animals will live longer if they are on a calorie-restricted diet. This has been shown in experiments with rats.

Rats may have unusual responses to calorie-restricted diets. Yes, what holds for rats *might* hold for other animals; the argument offers some support for its conclusion. But the conclusion overstates things. That animals will live longer on calorie-restricted diets has not been "shown" by the experiments. Further testing is called for.

One very important variety of generalizing from exceptional cases is known as the **Fallacy of Biased Sample.** It occurs when a speaker or writer incautiously bases a generalization about a large population on an atypical or skewed sample. For example:

Almost everyone in a large survey of Tea Party members thinks the president should be impeached. Therefore, most Americans think the president should be impeached.

The problem here isn't that the survey is small, because it might be large. Rather, the problem is that Tea Party members might have atypical opinions.

When logicians call a sample "biased," they don't mean that it is a

sample of people who have unfounded opinions about something. They mean that the sample is potentially atypical or skewed. Here is another example of the fallacy of biased sample:

> Judging from what car dealers say, most businesspeople now think the economy is improving.

It is unsafe to generalize about what most businesspeople think from what car dealers think, because car dealers see the economy from their own perspective. This is a biased sample, meaning not that car dealers' opinions are unfounded, but that they do not reflect every perspective.

Whom Do You Trust?

- When it comes to deciding which kind of car to buy, which do you trust more—the reports of a few friends or the results of a survey based on a large sample?
- When it comes to deciding whether an over-the-counter cold remedy (e.g., vitamin C) works, which do you trust more—a large clinical study or the reports of a few friends?

Some people trust the reports of friends over more reliable statistical information. We hope you aren't among 'em. (According to R. E. Nisbett and L. Ross, *Human Inference: Strategies and Shortcomings of Human Social Judgment* [Englewood Cliffs, N.J.: Prentice Hall, 1980], people may be quite insensitive to sample size when evaluating some products, being swayed more by the judgments of a few friends than by the results of a survey based on a large sample.)

Another version of generalizing from an exceptional case is known as the **Self-Selection Fallacy.** This fallacy happens when someone generalizes incautiously from a self-selected sample. A self-selected sample is one whose members are included by their own decision. Here is an example of the self-selection fallacy:

> Most Americans have a favorable view of the president as a person, judging from an online survey conducted by CNN.

The opinions of respondents to an online survey constitute a skewed sample, because the respondents select themselves into the sample by their own decision. Such samples underrepresent people who don't have the inclination or time or means to respond.

Accident

The fallacy of **Accident** occurs when a speaker or writer assumes that a general statement automatically applies to a specific case that is (or could well be) exceptional. This is an example:

> It is illegal to use a cell phone while driving; therefore, that police officer committed a crime when she used her cell while driving.

The general statement that it is illegal to use a cell phone while driving does not automatically apply to the special circumstance mentioned. It is easy to imagine situations when police business might best be conducted on a cell. In addition, police presumably have intensive training handling a car in challenging conditions.

The fallacy of accident has various unnamed varieties so we will provide various examples. Here is one:

> Everyone should have access to a college education. Therefore, anyone who applies should be admitted to Cal Poly.

A general rule is being applied here to an exceptional case in which it does not automatically hold. Among other things, students who attend Cal Poly may need special skills or training that Cal Poly cannot itself provide.

Here is another example:

> In this country we have a right to free speech. Therefore, if I want to threaten the mayor, that is my right.

The right to free speech does not include the right to issue threats. Even so-called absolute rights are subject to limitations where there is a compelling social interest.

Here is a slightly different type of example. It will sound familiar.

> Costco sells for less. Therefore, lawn fertilizer will cost less at Costco.

At first glance this might seem to be a good argument. However, remember what we said earlier. If you found that lawn fertilizer costs less at Costco than at other stores, you would not conclude from *that information alone* that Costco *in general* sells for less. That would be a case of hasty generalization. The reverse argument also is a fallacy, the fallacy of accident. The fact that Costco *in general* sells for less raises the probability only slightly that it will sell *this specific item* for less.

One final example:

> This city has a very high crime rate; therefore, it will be dangerous to shop in this neighborhood.

This is similar to the Costco example. It would be hasty generalization to draw a conclusion about a city's overall crime rate from what you observed in one particular location, at least if the city is large. Likewise, it is the fallacy of accident to infer from the city's overall high crime rate, considered in and of itself without regard to anything else, that a particular location in the city has a high crime rate.

WEAK ANALOGY

The fallacy known as **Weak Analogy** (sometimes called **False Analogy**) is a weak argument based on debatable or unimportant similarities between two or more things.

> My mom is just like Adolf Hitler. I doubt she will let me go out with you guys.

The speaker offers an analogy between her mom and Adolf Hitler, presumably to support the contention that she is a ruthless dictator who won't allow her daughter to do something with us. The similarities between Adolf Hitler and her mother, if there are any, are almost certainly superficial. For one thing, Adolf Hitler was a sociopath. We hope few other human beings are like him.

Here is another example:

> The federal government is just like a private household. If it doesn't balance its budget, it will go bankrupt.

This argument likens the federal government to a household like yours or mine, to support the idea that the federal government will go bankrupt if it doesn't balance its budget. But the analogy is weak because the federal government has ways of avoiding bankruptcy indefinitely that are not available to a private household. These include being able to raise taxes, print more money, and stimulate economic growth and

foreign investment.

This is another example:

> If you knife someone to death, you will be charged with murder. Therefore, if a surgeon kills someone, she should be charged with murder.

A difference is that a surgeon's error is accidental. If it isn't, he or she should be brought up on charges.

Another example:

> In the wild, wolves eat nothing but raw meat. Therefore, we should feed our dog nothing but raw meat.

The conclusion may be true, but this argument is weak support. Canine digestive systems may have evolved differently from wolves'.*

One more example:

> In the 1960s scientists were worried about global cooling, and their worries turned out to be unjustified. Therefore, their present concern with global warming will also turn out to be unjustified.

A difference is that the present concern is based on fifty years of additional and improved data, including many more monitoring stations, satellite measurements of glaciers and artic sea ice, and so forth.

Most assuredly, not every argument based on an analogy is a fallacy. To take an obvious example, a court ruling based on a legal precedent draws an analogy between the present case and a past ruling. Such arguments are the basis of legal reasoning. But jurists always look for relevant differences between an alleged legal precedent and the case currently before them. We should be similarly cautious when we are offered arguments based on analogies.

MISTAKEN APPEAL TO AUTHORITY

A speaker or writer commits the **Mistaken Appeal to Authority** when he or she tries to support a contention by offering as evidence the opinion of a nonauthoritative source. Here is an example:

> My father thinks the president lied. Therefore, the president lied.

The fact that it is one's father who thinks the president lied does not affect the probability that he did—unless, of course, the subject is something the father would have special knowledge about. There is no reason to suppose that is the case here.

Here is another example of a mistaken appeal to authority:

> My doctor thinks my car has leaking valves. Therefore, my car has leaking valves.

Everything else being equal, that your doctor thinks you have leaking heart valves raises the probability that you do. But everything else being equal, that your doctor thinks your car has leaking engine valves does not raise the probability that it does.

Of course special circumstances can diminish a physician's authoritativeness in regard to medical conditions, too—just as special circumstances can diminish any expert's authoritativeness within his or her sphere of expertise. One of the most common occurrences of mistaken appeal to authority occurs when an authority in one field, domain, or discipline is assumed without further ado to be an authority in an unrelated field, domain, or discipline. We have discussed credibility and authoritativeness at length in **Chapter 4** and refer you to that material now.

MISTAKEN APPEAL TO POPULARITY (MISTAKEN APPEAL TO COMMON BELIEF)

The fallacy known as **Mistaken Appeal to Popularity** (sometimes called **Mistaken Appeal to Common Belief**) happens when a speaker or writer treats an issue that cannot be settled by public opinion as if it can. Here is an example:

> The Iranians have nuclear weapons. Everyone knows that.

Even if you had a way of telling what "everyone" thinks on this subject, and even if everyone believed the claim in question, the argument does not provide much support for it. To find out if Iran has nuclear weapons, the International Atomic Energy Agency has technical means of investigation that do not include consulting popular opinion polls.

Here is another example:

> Almost everyone knows that plastic is contaminating the oceans. Therefore, plastic is contaminating the oceans.

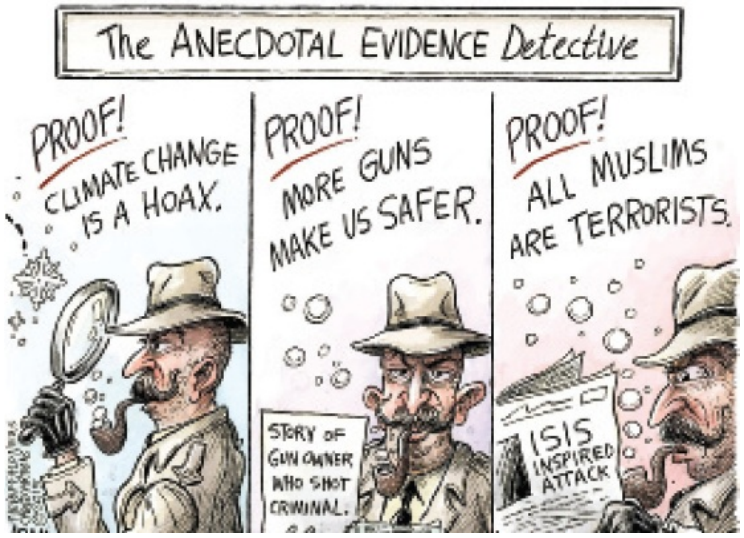
Whether plastic is contaminating the oceans cannot be determined by consulting popular sentiment.

Another example:

> Hondas get great gas mileage.
> Everyone knows that.

To find out whether a car gets good gas mileage you have to run tests, not ask people what they think.

However, not every argument of the form *"X is true because most people think X is true"* is a fallacy. If most people around a stream say you need a fishing license to fish those waters, that would be a good reason for thinking you do. But notice that whether or not you need a fishing license is something people from around there might well know. You would not find out *definitively* if you need a fishing license by asking people—they might be wrong—but this is the sort of circumstance in which popular belief counts as evidence for the truth of a claim.



Zyglis, Adam, Cartoon from The Buffalo News. Copyright © by Cagle Cartoons, Inc. All rights reserved. Used with permission.

Let's leave matters this way: Ask yourself, Would a scientist writing in a scientific journal offer popular opinion as evidence of something's truth or falsity? If not, then you would commit the mistaken appeal to popularity if you did. This rule of thumb won't help in every case, but it will help to weed out egregious instances of the fallacy.

Mistaken Appeal to Common Practice

Sometimes speakers and writers try to justify a *practice* on the grounds that is traditional or is commonly practiced. The **Mistaken Appeal to Common Practice** (sometimes called **Mistaken Appeal to Tradition**) is a variant of the mistaken appeal to popularity. Here is an example:

This is the right way; it's the way it has always been done.

If tradition by itself truly justified a practice, then human slavery, burning people at the stake, and any other extreme and deplorable behavior would have been justified if it happened to have been "traditional."

Bandwagon Fallacy

Sometimes by mentioning the popularity of a proposition, a speaker or writer may not be trying to offer "evidence" of its truth. Instead, he or she may be dangling a psychological inducement to believe it. He or she may be playing on the natural human tendency to want to be a part of things, to be one of the group. When a speaker or writer uses "everyone thinks" (and other such phrases) as a psychological ploy, he or she commits the **Bandwagon Fallacy.** Here is an example:

Hillary Clinton has earned your support. Everyone is endorsing her.

An Example of Appeal to Common Practice

"Shell [Oil Company] was charged with misleading advertising in its Platformate advertisements. A Shell spokesman said: 'The same comment could be made about most good advertising of most products.'"

—Samm S. Baker, *The Permissible Lie*

A perfect example of a mistaken appeal to common practice.

The speaker wants us to jump on the bandwagon. He or she has not shown that Hillary Clinton has earned our support.

Here is one more example:

> Let's get a spa. They are very popular these days.

The speaker hasn't really shown that we *need* a spa. He wants us to get on the bandwagon.

A final example:

> You shouldn't shop at Walmart. None of us does that.

If you overheard someone say this, you would have no idea what is supposed to be wrong with Walmart. You would know, however, that the speaker was employing the bandwagon fallacy.

The bandwagon fallacy also can be classified as an appeal to emotion, but its similarity to the mistaken appeal to popularity justifies its inclusion here.

Appealing to Tradition

According to Representative Steve King of Ohio (pictured here), "Equal protection [under the Constitution] is not equal protection for same sex couples to marry. Equal protection has always been for a man and a woman to be able to get married to each other."

FALLACIES RELATED TO CAUSE AND EFFECT

It can be difficult to prove a cause-and-effect relationship between two variables, which is why mistaken reasoning can occur in this context. In this section we explore two important fallacies that can be made in reasoning about cause and effect. What the two fallacies have in common is this. Both assume that the timing of two variables relative to each other, in and of itself, is sufficient to establish that one is the cause and the other is the effect. This assumption is incorrect.

Post Hoc, Ergo Propter Hoc

Post Hoc, Ergo Propter Hoc means "After this, therefore because of it." A speaker or writer commits this fallacy when he or she assumes that the fact that one event came after another establishes that it was caused by the other. Here is an example:

> After I took Zicam my cold went away fast. Therefore taking Zicam caused my cold to go away fast.

The speaker makes a mistake to assume that Zicam caused the cold to go away fast. The argument is no better than this one:

> After I played poker my cold went away fast. Therefore playing poker caused my cold to go away fast.

Here is a slightly different example, a classic illustration of *post hoc, ergo propter*

hoc:

Every day the sun comes up right after the rooster crows; therefore the rooster causes the sun to come up.

The Easy Way to Make a Killing in the Stock Market!

Sophisticated mathematical schemes for predicting the behavior of the stock market abound, but you may think you don't need any of them. You may think all you need to do is watch the Super Bowl every winter. In 80 percent of the years since the first Super Bowl in 1967, a win by a National Conference team has been followed by a good year in the market, and a win by an American Conference team has been followed by a bad year. So getting into the market after an NFC win and out of it after an AFC win should produce good results 80 percent of the time, right?

Not a sports fan? Another indicator of how the market will perform is known as the "hemline indicator," first presented in 1926 by economist George Taylor. The idea is that when the hemlines of ladies' skirts go up, it signals good economic times; and when they go down, bad times are ahead. The hemline-market correlation has held more frequently than chance would dictate.

Are you intrigued by either of these correlations? This doesn't have anything to do with the stock market, but in 17 out of the last 18 presidential elections, when the Washington Redskins football team won its last home game, the nation's presidential election went to the party of the incumbent president. Good enough odds for a big bet on the next election, no?

Well, no. The fact is, if you look at enough *possible* correlations, you will certainly find some that look like sure things. Of the many, many things that go up and down in some sort of cycle, *some* of them are coincidentally going to match the movement of the market; and of the many, many things that either happen or don't, some of them are going to match the outcome of

presidential elections.

Correlation does not equal causation! If no causal link exists between two things, then the correlation is mere coincidence, and you're best off treating it as a joke rather than the basis for making decisions. In **Chapter 11**, we discuss ways of eliminating the possibility that a correlation between two things is coincidental.

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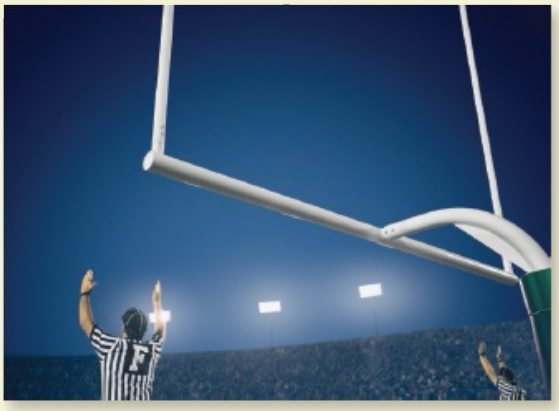
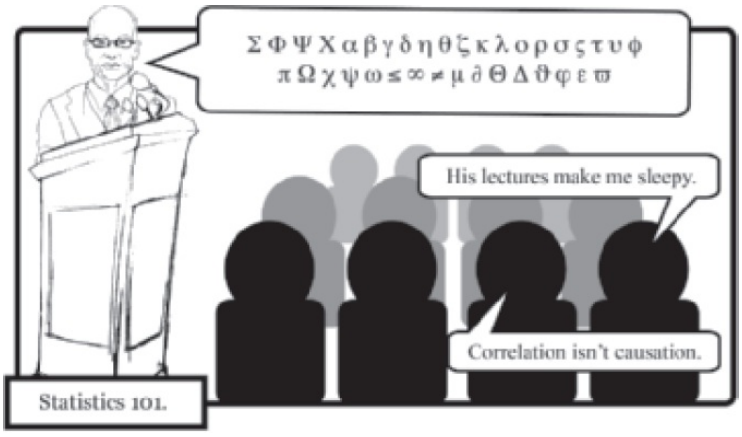
http://online.wsj.com/article/SB10001424127887324105204578384832555959160.html.



As you can see from this example, the fact that one event *invariably* follows another event *still* doesn't establish that the first event caused the second event. This fact is often expressed by saying *"Correlation does not prove causation,"* a phrase worth remembering.



Post hoc ergo propter hoc often is referred to simply as *post hoc*. Here is another example of the *post hoc* fallacy:

After you drove my car it was hard to start. Therefore, it was something you did that made my car hard to start.

You may think this is a reasonable argument. Indeed, when an unusual event is followed by another unusual event and we can see how the first might cause the second, it is not a fallacy to think that it *might* have done that. A fallacy occurs only when we assume that the sequential timing of events, in and of itself, *establishes* cause and effect between them, as in the example just given.

Overlooking the Possibility of Coincidence

A special case of the *post hoc* fallacy is known as **Overlooking the Possibility of Coincidence.** Here is an example:

> After Susan threw out the chain letter, she was in an automobile accident. Therefore throwing out the chain letter caused her to get in an automobile accident.

The speaker has overlooked the possibility that the sequential events were coincidental.

Overlooking a Possible Common Cause

Another instance of the *post hoc* fallacy is known as **Overlooking a Possible Common Cause.** Here is an example:

> I left the lights on when I went to bed. Next morning I woke up with a headache. Therefore leaving the lights on caused the headache.

The speaker has overlooked the possibility that leaving the lights on and waking up with a headache may each be the effects of a common cause, such as having gone to bed unusually tired or intoxicated.

Overlooking the Possibility of Random Variation

Yet another instance of *post hoc* reasoning occurs when we ignore the fact that values of variables fluctuate randomly. For example, the average distance that one randomly selected group of men can throw a football will vary randomly from the average distance another randomly selected group of men can throw a football. Likewise, the average distance a randomly selected group of men can throw a football will vary randomly from the average distance the *same* group of men can throw a football on a second try. If you assume that this random fluctuation is due to causation, you make the mistake known as **Overlooking the Possibility of Random Variation.** Here is an example:

In our tests, we asked randomly selected men to drive a golf ball as far as they could. We then had them wear our magnetic bracelet and try again. On the second occasion, the men hit the ball an average of ten feet further. Our bracelet can lengthen your drive as well.

The speaker is implying that the magnetic bracelet caused the improvement in the average drive lengths. However, the improvement might simply have been due to random variation. Until he has eliminated that possibility, the speaker has committed a fallacy. (In **Chapter 11** we explain what is required to reduce the likelihood that such changes are due to randomness.) If we performed the test again, the average drive length might decrease. In any case the average drive length is almost certain to change randomly from one trial to the next. So we should not by a change, or assume it must be due to something other than random fluctuation.

Overlooking the Possibility of Regression

A directly related fallacy is known as **Overlooking the Possibility of Regression.** This mistake is committed when we overlook this fact*: If the average value of a variable is atypical on one measurement, it is likely to be less atypical on a subsequent measurement*. This may sound complicated, but it isn't. If the average distance the randomly selected men drove a golf ball is relatively distant from the "true average" for all men, then on the second try, the average is apt to be closer to the true average. This phenomenon is known as *regression to the statistical mean*. The more atypical the value of a variable is on one measurement, the more likely it is that it will be less atypical on the next measurement. If we overlook this fact, we commit the fallacy of overlooking the possibility of regression. Here is an example:

We measured the IQs of a group of students and found the average to be relatively low. Then we had them take a course in critical thinking, after which we measured their IQs again. Their IQs were higher. Therefore the course in critical thinking raised their IQs.

As you now know, their average IQs were apt to be higher on the second measurement (closer to the "true average") anyway. The speaker has overlooked that fact and attributed the change in IQ scores to the critical thinking course, which is a fallacy.

Here is another example—one high school basketball coach talking to another coach:

The girls shot well below their average on Monday, so I made them do fifty sets of pushups. Guess what? Their average was much better on Tuesday. Pushups did the trick.

The coach has overlooked the fact that the girls' shooting was apt to improve even if she had served them cookies rather than having them do pushups.

For obvious reasons, researchers conducting clinical trials are careful not to overlook the possibility of regression before they conclude that a drug works. If, for example, the members of a group of people have atypically high average blood pressure on one measurement, their average blood pressure is apt to be closer to the human norm on a second measurement—even if they have had nothing fancier than a glass of water. We go into the matter in more detail in **Chapter 11**.

For equally obvious reasons, unscrupulous makers of magnetic bracelets might simply run "trials" in which men hit golf balls, until a trial happened in which the average drive was fairly short. At that point, the manufacturer of the bracelet could ask the men to put on bracelets, knowing that on the next trial their average drive is likely to improve and could be attributed, mistakenly, to the bracelet. Such misuses of data are not limited to magnetic bracelet manufacturers, of course. Any device that might be alleged to improve a measurement people are interested in could be shown to "work" by this simple technique.

Cum Hoc, Ergo Propter Hoc

Cum Hoc, Ergo Propter Hoc means "With this, therefore because of it." A speaker or writer commits this fallacy when he or she assumes that the fact that two events happen at about the same time establishes that one caused the other. This fallacy is so similar to *post hoc, ergo propter hoc* that not all logicians list the two as separate fallacies. However, we have found that confusion can crop up if the two are not listed separately. Here, then, is an example of *cum hoc, ergo propter hoc:*

John had a heart attack while he was saying a prayer. Therefore the prayer caused the heart attack.

Now, the fact that two unusual events happen at the same time can be a reason for thinking that one *might* have caused the other; but it is never sufficient to *establish* that this happened, as the speaker in the previous example implies.

Here is another example of *cum hoc:*

Children with long hair are better spellers than children with short hair. Therefore

having long hair makes a child a better speller.

This premise is perhaps absurd (though perhaps not!), but the conclusion does not follow in any case. The example is another illustration that correlation does not prove causation.

Overlooking the Possibility of Coincidence

Overlooking the Possibility of Coincidence can occur as a special case of *cum hoc* mistaken reasoning as well as a special case of *post hoc* mistaken reasoning. For example, the speaker in the hair/spelling example just given overlooks the possibility that the correlation between having longer hair and being better spellers is coincidental.

Here is another example of *cum hoc* in which a speaker overlooks the possibility of coincidence:

I got cancer when I lived under a high-voltage power line. Therefore the high-voltage power line caused my cancer.

The speaker is overlooking the possibility that the two events are coincidental. Again, when two unusual events happen at the same time it is not necessarily a fallacy to think that one *might* be causative. It is a fallacy, however, to think that the juxtaposition in and of itself *establishes* that one is causative.

Overlooking a Possible Common Cause

It was said previously that **Overlooking a Possible Common Cause** is a special case of the *post hoc* fallacy. It can also be a special case of the *cum hoc* fallacy. Here is an example:

Chimney fires and long underwear purchases increase in frequency at the very same time. Therefore chimney fires cause people to buy long underwear.

The speaker in this example has ignored the possibility that the events in question are both the effects of a common cause, the weather turning colder.

Overlooking the Possibility of Reversed Causation

Sometimes a speaker or writer who commits the *cum hoc* fallacy is guilty of **Overlooking the Possibility of Reversed Causation.** Here is an example:

People who walk long distances enjoy good health. Therefore, walking long

distances will make you healthy.

This speaker has assumed that the walking accounts for the good health. Maybe he or she has it backward. Maybe being healthy accounts for the walking.

Here is another example of overlooking the possibility of reversed causation:

Successful businesspeople often drive expensive cars. Therefore, driving an expensive car will help make you a successful businessperson.

This speaker has overlooked the possibility that driving an expensive car is the *result* of being successful, not a *cause* of it.

Argument by Anecdote (Causal Variety)

Finally, before we leave *post hoc* and *cum hoc* mistaken reasoning, we should note this: Just as it is a fallacy to try to support (or disprove) a *general* claim by telling a story, it is a fallacy to try to support (or disprove) a cause-and-effect claim by telling a story. Attempting to do the latter is also known as the fallacy of **Argument by Anecdote.** Here is an example:

I've heard doctors say eating red meat daily increases your risk of heart disease, but I don't believe it. My uncle was a rancher and he lived to be 100. His entire life he ate red meat three times a day. He didn't die of a heart attack, either. He died when he fell down a well.

A single story like this does not establish the presence or absence of causation. The matter is treated extensively in **Chapter 11**.

SLIPPERY SLOPE

The **Slippery Slope** fallacy is an argument that rests on an unsupported warning that is controversial and tendentious, to the effect that something will progress by degrees to an undesirable outcome. (A tendentious assertion is one that is slanted toward a particular point of view.) Here is an example:

We should not require gun owners to carry liability insurance, because if we do that, before long they will repeal the Second Amendment.

The speaker has made a surprising and controversial statement. This is not like saying that if you run your AC twenty-four hours a day, your utility bill will go up. The

speaker should support his theory. Until he does, his argument is a slippery slope fallacy.

Here is another example:

> No, I don't think we should tip servers 20 percent. The next thing you know we will be tipping them 25 percent, then 30 percent, then who knows what. We will be giving out our entire paycheck every time we eat out.

What we should say to this speaker is "Why couldn't we stop at 20 percent?" We could also just say, "Give me a break."

Another example:

> Raising the Pentagon's budget by 5 percent this year will just lead to a continuous 5 percent increase. In twenty years, the *whole budget* will go to the military!

There has to be support for the claim that the increases will continue. Otherwise this is a slippery slope fallacy.

For obvious reasons, some logicians treat the slippery slope fallacy as a version of scare tactics. You would not be wrong to regard any of these three examples in that light. Incidentally, a slight change in wording can convert many slippery slope fallacies into false dilemma fallacies (discussed in **Chapter 6**) and *vice versa*. For instance, the last example can be made into a false dilemma by wording it this way:

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> Either we deny the Pentagon a 5 percent increase this year, or in twenty years it will get the entire budget.

Both versions have the same objective: to get a listener to oppose the 5 percent increase for the Pentagon.

UNTESTABLE EXPLANATION

When someone offers an explanation that could not be tested even in principle, he or she is said to commit the fallacy of **Untestable Explanation.** Here is an example:

> He has heart issues because of sins done in a previous life.

This explanation is untestable. There is no way to tell if someone is a previous-life

sinner. In fact we cannot even identify people who have had previous lives. Plus, who is to say that someone's past life was in a human form? Perhaps some of us had previous lives as bugs and such. We do not know if bugs are capable of sin, but we do know that we cannot distinguish a bug that has sinned from one that has not.

Some explanations are untestable because they are circular. They merely repackage themselves in alternative language. Here is a stock example:

> Hooray! The Kings are winning again. That's because they are gaining momentum.

This explanation is not quite as circular as saying that the Kings are winning because they are ahead. Still, it does basically just repeat itself using different words. One could not test it. The only way to identify a gain in momentum is to look at the scoreboard.

Finally, some explanations are untestable because they are too vague. Here is an example:

> The crime rate has gone up because of general moral decay.

This argument isn't circular; moral decay, whatever it is, is not identical to a rising crime rate. Rather, the problem here is vagueness. We do not know what moral decay is exactly, and so we do not know how to test the assertion.

LINE-DRAWING AGAIN

When exactly does an analogy become weak? Precisely where do you draw the line between a credible authority and one who lacks credibility? When exactly does a report cease to be a report and become an anecdote? When exactly does a slippery slope become tendentious or controversial? You can't say in any of these cases. However, don't forget the line-drawing fallacy discussed in **Chapter 6**. That you cannot draw a precise demarcation between a weak analogy and one that is not weak, does not mean that every analogy is weak or that none are, or that there is no such thing as the fallacy of weak analogy. Similar remarks hold for the other distinctions just mentioned.

Recap

The fallacies in this chapter are inductive fallacies—arguments that offer at best only weak support for their conclusions. We specifically examined the following:

- Hasty generalization—generalizing from too few cases or from samples that

are too small

- Generalizing from exceptional cases—generalizing from cases that are exceptional or from samples that are biased (skewed)
- Accident—applying a general statement to a possibly exceptional case
- Weak analogy—offering an argument based on debatable similarities between two or more things
- Mistaken appeal to authority—attempting to support a claim by citing a source that is not really an authority
- Mistaken appeal to popularity—treating an issue that cannot be settled by public opinion as if it could
- *Post hoc, ergo propter hoc*—thinking that a temporal succession between two variables, in and of itself, establishes a cause-and-effect connection between them
- *Cum hoc, ergo propter hoc*—thinking that simultaneity between two variables, in and of itself, establishes a cause-and-effect connection between them
- Slippery slope—offering an argument resting on an unsupported warning that something will progress by degrees to an undesirable outcome
- Untestable explanation—an argument based on an untestable explanation

EXERCISES

Here are 125 examples of the fallacies discussed in this chapter.* Match each item to one or more of the following categories:

a. hasty generalization/generalizing from exceptional cases
b. accident
c. weak analogy
d. mistaken appeal to authority
e. mistaken appeal to popularity
f. *post hoc, ergo propter hoc/cum hoc, ergo propter hoc*
g. overlooking the possibility of random variation or regression
h. slippery slope
i. untestable explanation

Notes

- Some items arguably fall into more than one category; this is true in real life as well. But no item in this exercise could plausibly be said to fall into every

category. Your instructor will tell you if your categorization is too much of a stretch.

- It may be especially difficult to distinguish hasty generalization from generalizing from an exceptional case; and to distinguish *post hoc, ergo propter hoc* from *cum hoc, ergo propter hoc.* Your instructor may or may not ask you to do so.
- Your instructor may or may not ask you to further assign examples into one or more of the following subcategories: argument by anecdote, fallacy of small sample, fallacy of biased sample, overlooking the possibility of coincidence, overlooking the possibility of a common cause, and overlooking the possibility of reversed causation.

▲ 1. I'd better not eat this lemony dessert thing. If I do, there will be no end. Hamburgers, chips, ice cream, chocolates—you name it and I will eat all of it. I will explode.

2. Stress bad for you? That's a myth. I know all sorts of Type A people who are in excellent health.
3. These university kids drink like crazy on Halloween and St. Patrick's Day. They probably drink like crazy on Christmas, too.
4. I had a great time at the party last night; I'll bet all university parties are great.

▲ 5. The prayer leader cured her rheumatism. She said he did, and who would know better than she?

6. Salmon is very bad for dogs. You shouldn't let your cat eat it either, I'd guess.
7. You have to stand up for what you believe. Ignore it if your wife complains about how fast you are driving.
8. Most Americans watch *American Idol.* That's clear since over one million people cast votes on the season finale.
9. ONE GUY: The guy Paulson shot had climbed through a window and was coming down the darkened hallway.
   ANOTHER GUY: Doesn't matter; he still should have been charged with murder because the guy he shot was unarmed.

▲ 10. I tried to buy a portable heater from the Saber Company last winter, and it was back-ordered. After a month, I just canceled and decided not to do any more business with them.

11. "In a message about discrimination in private clubs, he [Morley Safer] wrote that all clubs, by definition, discriminate through

admissions policies and hefty annual dues. ‘What will be next?’ he asked. ‘Disassociation with clubs that do not cater to vegans on their menus? Kosher dining rooms? Special facilities for nudists and transsexuals?’”

—New York Times

12. The heart attack rate spikes the day clocks are set ahead for daylight saving time, demonstrating how time change can affect our health.
13. The professor is a fantastic teacher. He should run for Congress.
14. These days young people don’t like expensive cars. You hardly ever see a teenager driving a Maserati.

▲ 15. Prostate cancer is almost unheard of in countries where they don’t eat meat, proof positive that meat in your diet will lead to prostate cancer.

16. When the government bailed out General Motors it set a bad precedent. Now it’ll be bailing out banks and the automobile industry and any company that isn’t competent enough to stay in business on its own.
17. The new law says everybody who takes a firearms course can carry a concealed weapon, so I don’t see why I can’t take my gun to school.
18. My son thinks Galaxies are better than iPhones, and he should know since he is a teenager.
19. I’m putting my money in a Vanguard account. My history teacher thinks the firm has the best mutual funds, and he is a smart man.

▲ 20. Be prepared. We are traveling to a Third World country; there won’t be good hotels.

21. You would not go into the woods if you knew there were bears there, and the same thing therefore holds for getting into a bear market. Hang on to your money until the market changes.
22. Given the right circumstances, humans will always revert to savages. Look at the Nazis.
23. We live in a democracy. That’s why children should be allowed to vote.
24. My student evaluations were better this year. I’ll bet it’s because I had to cancel class two times.

▲ 25. Statistics show that smokers disproportionately come from low-income areas. We are trying to figure out what it is about poverty that makes people smoke.

26. Global warming is not caused by human activity—and the latest polls show the majority of Americans agree.

27. Jean plays the flute beautifully. I'll bet she could learn the guitar in no time.

28. Just after I started doing yoga in the mornings, my golf swing improved. Yoga lowered my score!

29. Hank has sold Subarus for years, and he knows them as well as anybody. So when he says they make a better car than Toyota, I believe it.

▲ 30. Eating fish three times a week is supposed to be good for you, but I tried it for several months and never noticed an improvement.

31. Women are still paid less than men. Look at Walmart. The company is always getting sued for discrimination.

32. I assume my doctor watched the Super Bowl, since it is the most popular TV program in existence.

33. If I can make time for a movie, you can make time for a movie.

34. The chancellor now requires us to post syllabi online. Before long there won't be such a thing as face-to-face teaching.

▲ 35. In Stephen Hunter's new novel he showed how a conspiracy was involved in the murder of John F. Kennedy. After reading the book, I've decided the Warren Commission was mistaken and that Lee Harvey Oswald did not act alone.

36. Over the long haul, Obamacare will cut medical expenses. Informed people all say that.

37. My blasted pen leaked and ruined my shirt. I'll never buy another Bic.

38. Don't be alarmed if the pilot seems a little tipsy. After all, flying is safer than driving.

39. The country was safer after Obama was elected. That's why the economy improved.

▲ 40. The air in American cities is pretty bad. I was in Houston the other day and the air was foul.

41. If the delays in this flight are any indication, this is not an airline I want to fly again.

42. I don't think the president's trip to the Middle East is a good idea. It will lead to our sending "advisers" there, and the next thing you know we'll have troops there and be involved in another war we can't get out of.

43. TV is fabulous these days. Just look at *Downton Abbey.* Refined, cultured, superb.

44. We don't have freedom of religion in this country. Public schools can't even lead kids in prayer. Atheism is being crammed down our throats.

▲ 45. Gay parents cannot raise children correctly. Reverend Jacobs says that, and as a man of God, he should know.

46. Judging from the way she carries herself, I'd say she is very self-centered.

47. My kindergarten class seemed unusually antsy today. I wonder if they were all on a sugar high.

48. No, I don't want to join a hiking club. That would just be the start, and then we'd be doing mountaineering and rock climbing and who knows what. I've got too much to do to spend all that time in the great outdoors.

49. Last year student test scores at our school were lower than usual. We responded by having teachers emphasize spelling. This year the scores were higher, showing how spelling helps kids learn.

▲ 50. It's well and good that Apple hired you, but don't expect to be paid much. In this country women still get shafted when it comes to pay.

51. They say stretching before exercising reduces your chances of a sprain. I'm skeptical. I don't stretch before I run and I'm perfectly healthy.

52. Boiled eggs are great. I'll bet boiled salmon would be great, too.

53. Tom Wolfe characterized Freud's theory concerning repression as similar to the way a boiler works. A boiler builds up pressure over time, and if the steam isn't let off somehow, an explosion will result. Similarly, therefore, if "pressure" isn't released, the result will be an emotional explosion.

54. "More and more, women are determining what everybody watches on TV. Just look at that show on HBO, starring Lena Dunham, *Girls,* it's called. Everybody's watching that show. Everybody."

—Rush Limbaugh

▲ 55. Being overweight can't be all that bad for you. Eighty percent of the population over twenty-five is overweight.

56. I didn't pray hard enough. That's why my prayers weren't answered.

57. Yawns are contagious. Ask anyone.

58. Well I'll be! Look at the great gas mileage we got on this trip! Not a whole lot better than usual, but still nothing to sneeze at. Shows what a tune-up will do.

59. Hey, it works! After I sprinkled Arm & Hammer around the sink, the ants disappeared.

▲ 60. Attendance is up today. They must think there is a test.

61. Premarital cohabitation is the road to perdition. You will end up in hell.

62. I find it very hard to lie; therefore I bet Casanova here isn't lying when he says he wants to marry me.

63. The average temperature in Arizona is much hotter than what you're used to. So I wouldn't plan on taking my vacation at the Grand Canyon. If I were you.

64. Secondhand smoke isn't harmful. My parents both smoked and I am perfectly healthy.

▲ 65. Amber isn't very good. After all, she was voted off *The X Factor.*

66. They make us come home by ten! Our parents don't let us do anything!

67. God displays his love by making Earth a paradise.

68. The park seems almost deserted today. Must be something going on downtown.

69. Siri, are there snakes around here?

▲ 70. After my granddad had his heart attack, his hair turned completely white. I didn't know a heart attack could cause that.

71. Low-fat milk has a lot of sugar in it. You want to stay away from those low-fat frozen dinners unless you want extra sugar in your diet.

72. It's not dangerous to tube here. Look at all the people doing it.

73. Most people here in Stockton think the recession will last several more years, judging from the call-in survey on Channel 5.

74. My father died at a young age. God's will.

▲ 75. I took Psych 100 last semester and it was terrible. The instructor went on

and on about stuff that never turned up on any of the quizzes or exams. I'm glad I never have to take another psychology class.

76. Watts has been doing the weather on the local channel for over ten years. I put more stock in what he says about global warming than on somebody I never heard of.

77. Look at Bill Gates. He didn't go to college, and he's a millionaire. College is such a waste of time.

78. Some skin products must help a person's skin look and feel better. After all, *Vogue* did a poll of its readers and found that most American women use them.

79. Don't start messing around with Facebook. Once you get involved with one of those social media traps you'll wind up living your whole life online.

▲ 80. There's no freedom of speech in this country. Look at how country radio wouldn't play the Dixie Chicks after they criticized George W. Bush.

81. My son loves the Boy Scouts; your son will too.

82. Facebook has to be a positive force in the world. Billions of people are signed up for it.

83. My students' scores have improved dramatically since I started giving tests online, which indicates that students learn more on online courses.

84. A person should defend his principles. Farley did the right thing slugging Wonderson during the debate last night.

▲ 85. The first time I played that golf course, I shot an 82. It must have affected my mental state, because I didn't score that well again for almost a year.

86. Since the SEC is the strongest conference in the country, Vanderbilt, long an SEC member, will doubtless beat whomever it plays in a bowl game.

87. We did a poll in my math class and found that most people believe there is sufficient tutoring help for students. So I don't think there's that much demand for more tutoring services.

88. Shoot, millions of people sunbathe. It can't hurt you.

89. Whenever I go to Kroger I'm hungry; do you suppose going to Kroger makes me hungry?

▲ 90. Obesity is more prevalent among people who live below the poverty line. It is paradoxical that a low-income level can make you fat, but it's the

truth.

91. This student isn't good at math. Therefore she won't be good at writing, either.
92. What's all this fuss about airport delays? I arrived at the airport this morning, and fifteen minutes later I had checked my bag, passed through security, and was at my gate, where I had to wait another hour to board my flight. It was dumb to have to arrive so early.
93. How can you deny global warming? This was the hottest summer on record.
94. A lot more people are near-sighted these days. Check out those kids over there on their computers. They all wear glasses.

▲ 95. It took years for Jennifer to get pregnant the first time, but it took only eighteen months after the first child for her to get pregnant again. Clearly, having one child raises the odds of having another.

96. Fatal accidents have decreased in recent years despite the fact speed limits are gradually being raised. The only conclusion you can draw from this is that driving fast makes people more careful.
97. I had severe arthritis until—thank goodness—I started taking glucosamine.
98. According to studies, people who live in poverty are much more likely to take drugs, showing how taking drugs can have economic consequences.
99. There's no unemployment in this country. I had no problem finding a job.

▲ 100. I have every right to burn tires in my backyard. It's a free country.

101. We wouldn't let the government force people to eat broccoli; therefore we should not let the government make people carry medical insurance.
102. I failed the final. But then I didn't get much sleep the night before. That explains it.
103. The police report said there were four arrests involving alcohol over the weekend near the university. Student drinking is now an epidemic.
104. Liquid egg whites are good for your health. It says so right here on the web page of this outfit that sells liquid egg whites.

▲ 105. Bad luck brought the airplane down.

106. People don't like Southwest Air. Check it out on Yelp. You will find several negative reviews.

107. Retailers have declared a war on Christmas. Walmart has replaced the traditional “Merry Christmas” greeting with “Happy Holidays.”

108. Once *American Idol* started to lose its popularity, nothing could reverse the trend. Therefore if our restaurant starts to lose its popularity, we will have a hard time stopping the trend.
109. It isn’t legal to text when you drive. I’ll bet it’s not legal to text when you ride a bike.
▲ 110. They want to make it illegal for a running back to hit someone with his helmet? Next thing you know they won’t even allow tackling.
111. You can’t walk fifty feet down the Las Vegas Strip without somebody handing you a card advertising call girls. The economy of this town must be built on prostitution.
112. I’ve always known that wine was good for your health. Do you think 40 million French people can be wrong?
113. You know about the *SI* jinx, don’t you? Players who appear on the cover of *Sports Illustrated* almost always have a poorer showing shortly afterward. Probably the extra attention affects their game.
114. In the nineties, the United States helped out in Bosnia. We should use the same strategy in Syria.
▲ 115. When I retake this stupid physiology course, I’ll get an athlete to tutor me. He’s bound to know the subject.
116. People have no right to keep vicious animals. Therefore my neighbors have no right to keep a dog that snarls at me through the fence.
117. Protein power builds muscle mass, according to my weight trainer. Obviously she would be someone who knows.
118. You shouldn’t break your word. Therefore you shouldn’t break your word to save someone’s life.
119. I signed up for one of those car giveaways at a casino, and bam! My inbox started to fill up with spam within a week. Don’t sign up for one of those things, ever.
▲ 120. Alicia doesn’t think it would be illegal, and she played an attorney in the senior play. That’s good enough for me.
121. TV is garbage these days. Just look at *2 Broke Girls.* Pornographic garbage.
122. Everyone should have access to a college education. Therefore there should be no entrance requirements here at Cal Poly.

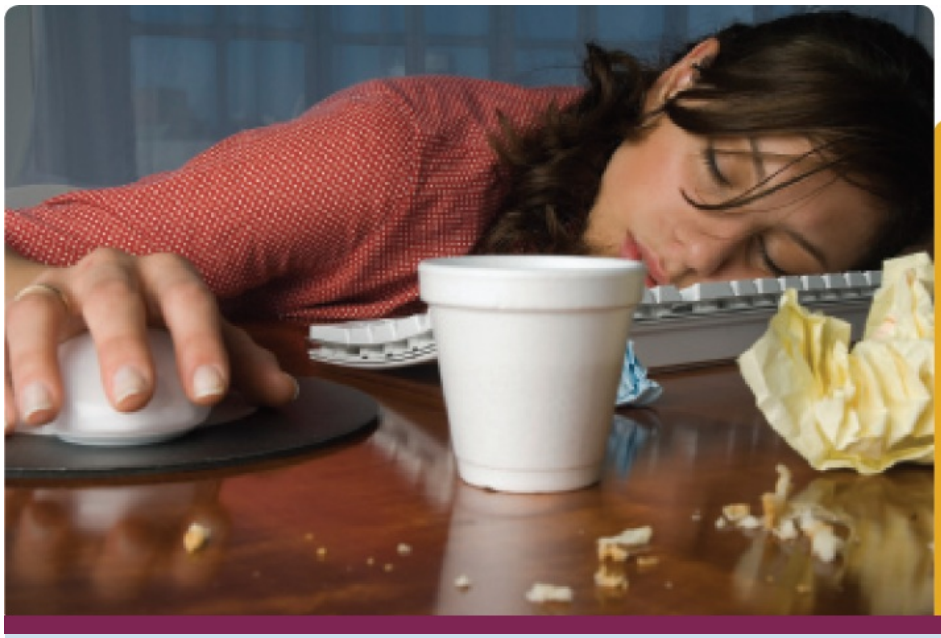
123. There they go again, the Democrats smearing us conservatives with a single brush. They all do that. Just look at this left-wing editorial in the *Washington Post,* pretending the congressperson from Missouri speaks for us all.

124. I just read about a study of obese people who went on a low-carb diet? After a year, almost none had achieved a normal weight. Shows me that this low-carb business doesn't really do the job for most folks.

▲ 125. There are about three million Muslims in England today, and it has been the fastest-growing religion in the country so far this century. If something isn't done soon, the English are all going to be facing Mecca and praying five times a day.

Formal Fallacies and Fallacies of Language

8



Students will learn to . . .

1 Define and recognize the three formal fallacies of affirming the consequent, denying the antecedent, and the undistributed middle
2. Define and recognize the fallacies of equivocation and amphiboly
3. Define and recognize the fallacies of composition and division
4. Define and recognize the fallacies of confusing explanations with excuses
5. Define and recognize the fallacies of confusing contraries with contradictories
6. Define and recognize fallacies related to consistency and inconsistency
7 Define and recognize four fallacies involved in calculating probabilities

In this chapter we'll turn our attention to fallacies that result either from a failure of form—which refers to the way the argument is set up—or from certain misuses of language.

THREE FORMAL FALLACIES: AFFIRMING THE CONSEQUENT,

DENYING THE ANTECEDENT, AND UNDISTRIBUTED MIDDLE

We'll take these three in order.

Affirming the Consequent

Let's start with an example:

(1) If Jane is a member of a sorority, then Jane is female.
(2) Jane is female.
Therefore (3), Jane is a member of a sorority.

The structure, or "form," of this argument is what makes it invalid rather than its content.

Here is the form of the argument presented previously:

If P then Q.
Q.
Therefore, P.

"P" and "Q" stand for independent clauses—parts of claims that are true or false. (The part of the first premise after the "if" is the **antecedent** of the claim; the part after the "then" is the **consequent.**) Whatever clauses the two letters might stand for, if they are arranged according to the previous form, the result is an invalid argument.* Any argument of this form commits the fallacy of **Affirming the Consequent.** Do you see why the following is also an example of this form?

If this dog is pregnant, then it is a female.
This dog is female.
Therefore, this dog is pregnant.

This form is so called because one premise affirms the consequent of the other premise. Remember, the consequent of an "if . . . then . . ." sentence like our first premise (*If this dog is pregnant, then it is a female*) is the part after the word "then." And that's all the second premise affirms.

Here is another example:

If the theory is correct, then the specimen is acidic.
The specimen is acidic.
Therefore, the theory is correct.

However valid this argument might look, it isn't—the second premise merely affirms the consequent of the first premise. The argument's form is exactly that of the previous example. One more:

If Sandy passed the final, then she passed the course.
She did pass the course.
Therefore, she passed the final.

Again, the argument is invalid. There may have been more than one way for Sandy to pass the course, for example, either by passing the final or by doing extra work. If she passed by doing extra work, the premises are both true and the conclusion is false.

Denying the Antecedent

Just as we get an invalid argument when one premise affirms the consequent of the other, the same thing happens when one premise denies the antecedent of the other.

For example:

If Sandy passed the final, then she passed the course.
Sandy did not pass the final.
Therefore, Sandy did not pass the course.

Here, the second premise is **Denying the Antecedent** of the first premise (the antecedent is the part after the "if"). The form of the argument is:

If P then Q.
Not-P.
Therefore, not-Q.

The circumstances that showed the previous example invalid do the same for this one: It may be that Sandy could *either* have passed the final *or* done extra work in order to pass the course, and she did the extra work and passed. In that case, the premises are true and the conclusion is false.

The Undistributed Middle

The fallacy of **Undistributed Middle*** happens when a speaker or writer (or you!) assumes that two things related to a third thing, the "middle," are otherwise related to each other. The fallacy appears in a variety of guises. Here is one example:

> All cats are mammals.
> All dogs are mammals.
> Therefore, all cats are dogs.

The fact that cats and dogs are both mammals does not mean they are otherwise related.

Here is another example, one you might fall for if you aren't careful:

> All German Shepherds are dogs.
> Some dogs bite.
> Therefore, some German Shepherds bite.

Surprise! This conclusion does *not* follow. Both premises could be true and the conclusion false, as would be the case if, for example, all the biting German Shepherds (but not other types of biting dogs) suddenly died. If this happened, the remaining German Shepherds would all still be dogs, and it would still be true that some dogs bite, but it would not be true that some German Shepherds bite.

So that you can see that this really is a fallacy, here is an identical argument that you would never fall for:

> All German Shepherds are animals.
> Some animals are cats.
> Therefore, some German Shepherds are cats.

Here is slightly different example of the undistributed middle fallacy:

> The sniper had to be a great shot, have access to the roof, have a high-powered rifle and scope, and be able to get through the crowd in the ballroom without being noticed.
> Aaron is a great shot, had access to the roof, had a high-powered rifle and scope, and was wearing a tux so he would not have been noticed going through the crowd in the ballroom.
> Therefore, Aaron was the sniper.

The fact that Aaron and the sniper are both great shots, had access, have the right kind of rifle, and could go through the crowd in the ballroom without being noticed doesn't *prove* that Aaron is the sniper. These facts make Aaron look suspicious, but they don't deductively demonstrate that Aaron and the sniper are one and the same.

The scheme of the sniper argument was this:

X has features a, b, c, etc.
Y has features a, b, c, etc.
Therefore, X is Y.

Here is another schema:

All Xs are Ys.
a (some individual) is a Y.
Therefore, a is an X.

Another schema:

If something is an X then it is a Y.
a (some individual) is a Y.
Therefore, *a* is an X.

Still another schema:

X is a Z.
Y is a Z.
Therefore, X is a Y.

And there is one more way to do it:

If P is true, then Q is true.
If R is true then Q is true.
Therefore, if P is true, then R is true.

An example of the last version: If Bill wins the lottery, then he'll be happy. If Bill buys a new car, then he'll be happy. Therefore, if Bill wins the lottery, then he'll buy a new car.

As you can see, these are all basically the same kind of fallacy, just packaged differently.

The three fallacies just discussed (affirming the consequent, denying the antecedent, and undistributed middle) are not to be confused with three valid argument structures that resemble them. In the box below, the three invalid structures are displayed side by side with the three valid structures. For more information on these structures, please see **Chapters 9** and **10**.

Common Valid and Invalid Argument Structures

Valid		Invalid	
Modus ponens	If in a sorority then female In a sorority Therefore, female	Affirming the consequent	If in a sorority then female Female Therefore, in a sorority
Modus tollens	If in a sorority then female Not female Therefore, not in sorority	Denying the antecedent	If in a sorority then female Not in a sorority Therefore, not female
Chain argument	If in a sorority then female If female then have longer life expectancy Therefore, if in a sorority then have longer life expectancy	Undistributed middle	If in a sorority then female If pregnant then female Therefore, if in a sorority then pregnant

[Note: There are other forms of "undistributed middle" arguments. See text, pages 272–274]

THE FALLACIES OF EQUIVOCATION AND AMPHIBOLY

Ambiguous claims can produce a fallacy. Here is a simple example:

All banks are alongside rivers, and the place where I keep my money is a bank.
Therefore, the place where I keep my money is alongside a river.

The fallacy in this example is called **Equivocation.** It is related to semantic ambiguity, which was discussed in **Chapter 3**, and occurs when a sentence contains a word or phrase that is open to more than one interpretation. Clearly, the word "bank" is used in two different senses in the premises of the argument, and this makes the argument invalid. Here's a somewhat more sophisticated example:

The *Washington Times* engaged in censorship by refusing to publish controversial authors.
Censorship is a violation of the First Amendment.
Therefore, the *Washington Times* violated the First Amendment.

The word "censorship" is used equivocally in the premises. For the second premise to be true, the word must mean that some governmental agency has prevented publication by threats of punishment. But that is not the meaning of the term required to make the first premise true. In that case, all it means is that the *Times* decided not to publish something that it could have published.

The fallacy of equivocation does not crop up too often, but when it does it can be slippery. In **Chapter 3**, we noted that clear definitions are crucial to argumentation, and one way they can fail is to be equivocal. For example, we saw that if one defines a selfish action as any action performed because we desire to perform it, we could conclude that all our actions are selfish. But if we then conclude that all our actions are selfish *in the ordinary sense,* we commit the fallacy of equivocation.

Just as equivocation makes use of semantic ambiguity, the fallacy known as **Amphiboly** makes use of syntactic ambiguity. In these cases, it is the structure of the sentence that causes the ambiguity rather than a single word or phrase. Recall examples like these from **Chapter 3**:

If you want to take the motor out of the car, I'll sell it to you cheap.

The sentence's structure does not make it clear enough whether "it" refers to the motor or the car. If someone used a sentence like this to try to mislead us about what was for sale cheap, he or she would be guilty of amphiboly.

And here is another example of amphiboly.

AGENT: You must show a birth certificate and a driver's license or a passport in order to apply to the program.

APPLICANT: Okay. I have my passport.

AGENT: And a birth certificate?

APPLICANT: You said *or* a passport, and that's what I have here.

The agent meant that a birth certificate was required, *plus* either a license or a passport; the applicant understood that either a birth certificate and license were required *or* a passport. This kind of problem crops up now and then when people are not careful enough about punctuation in their directions.

THE FALLACIES OF COMPOSITION AND DIVISION

The fallacy known as **Composition** occurs when a feature of the parts of something is erroneously attributed to the whole. Here is a simple example:

This building is built from rectangular bricks; therefore, it must be rectangular.

The fallacy is also related to the grouping ambiguity covered in **Chapter 3**: It is fallacious to reason from a claim about members of a group taken individually to a conclusion about the group taken collectively. For example:

The public thinks highly of individual members of Congress.
Therefore, the public thinks highly of Congress as a whole.

This is fallacious reasoning, because what is true of individual members of Congress may not be true of the whole collective.

Do you need curved bricks to build a curved wall?

The fallacy known as **Division** is the same as composition but going the other direction. An example:

> During the recent recovery my financial portfolio gained considerably in value. Therefore, Microsoft stock, which is in my portfolio, gained considerably in value.

The fact that the speaker's portfolio as a whole increased in value during the recovery does not show that any particular investment within it increased in value during the recovery.

Like the fallacy of composition, division also can hinge on the grouping ambiguity. Here's an example.

> Letter carriers in this town walk hundreds of miles each day. Cheryl, who delivers letters to my block and doesn't look very athletic, must be exhausted every day after walking that far.

Obviously, in the first sentence it was letter carriers taken collectively, not individually, who are said to walk hundreds of miles. So one cannot conclude from that premise that any single carrier walks so far.

Another example of division:

> The Miami Dolphins are the only team that ever went an entire NFL season, all the way through the Super Bowl, without suffering a tie or defeat. Clearly, they were the best team in the league that year. Therefore, that year the team's quarterback, Bob Griese, was the best in the league at his position, and running back Larry Csonka and wide receiver Mercury Morris likewise were the best at their positions.

No, what was just said of the individuals on the team does not follow. What is true of the whole may not be true of the individual parts. To turn our earlier example around: The fact that a building is round does not mean it must be made of round bricks.

Confusing Fallacies I: Composition versus Hasty Generalization

The fallacy of composition is easily confused with hasty generalization (covered in **Chapter 7**). When we jump from a fact

about the individual members of a collection (*The senators are all large*) to a conclusion about the members taken collectively (*Therefore, the senate is large*), we have a case of composition. But when we jump from a fact about an individual member of a collection (*Senator Brown is overweight*) to a conclusion about all the members of the collection taken individually (*Therefore, all the senators are overweight*), it's hasty generalization.

Confusing Fallacies II: Division versus Accident

The fallacy of division is also easily confused with the fallacy of accident. If we jump from a fact about the members of a collection taken collectively (*It is a large senate*) to a conclusion about the members taken individually (*Therefore, the senators are large*), that's division. Accident occurs when we jump from a generalization about the individual members of a collection (*Senators are wealthy*) to a conclusion about this or that member of the collection (*Therefore, Senator Brown is wealthy*).

CONFUSING EXPLANATIONS WITH EXCUSES

Back in **Chapters 1** and **2** we made a careful distinction between arguments and explanations. We reason fallaciously when we take the one to be the other, as in this case:

SPEAKER: The young man who killed all those people at Sandy Hook Elementary School was suffering from a half dozen mental disorders.

HECKLER: Oh, so now you're going to tell us he had an excuse for the horrible things he did!

Not necessarily. The speaker may simply be trying to explain why things happened as they did, which is not the same thing as *excusing,* never mind *justifying* those actions.

After the September 11, 2001, suicide attacks on the World Trade Center, a speaker at our university attempted to explain possible causes of the attacks. Some

assumed him to be excusing or justifying the attacks; Rush Limbaugh invited him to move to Afghanistan.

> Several excuses are always less convincing than one.
> —Aldous Huxley

It is one thing to *explain* why or how something may have happened, and it is another thing entirely to *justify* or *excuse* the event. To mistake the first for the others is to commit a fallacy we'll call **Confusing Explanations with Excuses.** An attempt to *excuse* or *justify* a thing or event requires an argument the conclusion of which is that the thing or event is justifiable or excusable.* But an attempt to *explain* the thing or event requires a story—an account of a causal chain—showing how the thing or event may have come to be.

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Here is another example:

I heard on the History Channel about how the weak German economy after World War I contributed to the rise of Adolf Hitler. What's that about? Why would the History Channel try to excuse the Germans?

> He that is good for making excuses is seldom good for anything else.
> —Benjamin Franklin

It is one thing to seek to understand how Hitler came to power in Germany, but it is quite another thing to excuse or justify its happening. To assume without further reason that a person (or a television show) that explains an event is thereby trying to excuse or justify it is to commit this fallacy. One *can* propose an explanation for something *and then go on* to use this explanation as part of an excuse or justification, but that is going beyond the explanation itself.

Money to Burn

Inflation in Germany was so severe in the 1920s that what could be purchased for four marks very quickly required 8000 marks. Marks were soon worth so little people used them for fuel in their stoves. Such facts are usually cited as part of the explanation for German discontent and belligerence after World War I. But it would be a mistake to assume that someone who cites them is trying to excuse or justify German belligerence.

CONFUSING CONTRARIES AND CONTRADICTORIES

Here is how contraries and contradictories can be confused:

> **VISITOR:** I understand that all the fish in this pond are carp.
> **CURATOR:** No, quite the opposite, in fact.
> **VISITOR:** What? No carp?

The visitor's conclusion does not follow. "None are carp" is not the opposite of "All are carp." A pair of claims that are exact opposites of each other are **contradictories,** meaning they *never* have the same truth value. But two claims that cannot both be true but can both be *false* are not exact opposites: they are **contraries.** "None are carp" and "All are carp" are contraries, not contradictories.

Two terms—"alive" and "dead," for example—may seem to be the exact opposite of each other. If that frog isn't alive, then it must be dead. But that doesn't follow about just any old object, as can be seen from this example:

> The instructions for the scavenger hunt said to bring back something dead. So I brought this rock. Now you're telling me it doesn't count? Do you think maybe it's alive?

The speaker here does not understand how "alive" and "dead" relate to one another. Being dead implies that the thing in question was once alive. Thus, it is not correct to say that rocks are dead. The point is that "X is alive" and "X is dead" can both be false (as in the case of the rocks). They are contraries. Now consider the two

sentences “X is alive” and “It is not true that X is alive.” These sentences really *are* exact opposites in that they cannot both be true (of the same X) *and* they cannot both be false. Such sentences are contradictories. To treat contraries as if they were contradictories is fallacious reasoning.

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■ Confusion at the putter factory? If we take these markings to mean “This is a heavy putter” and “This is a mid-weight putter,” then clearly something is wrong. Are these two claims contradictories or contraries?

Exercise 8-1

For each of the following pairs of sentences, determine whether they are contraries, contradictories, or neither.

▲—See the answers section at the back of the book.

▲ 1. a. Some of the exercises are difficult.
b. None of the exercises are difficult.

2. a. All kangaroos are marsupials.
b. No kangaroos are marsupials.

3. a. There is only a little gas in the tank.
b. There is a lot of gas in the tank.

▲ 4. a. John comes here every Tuesday.
b. John comes here every day.

5. a. Today is Friday.

b. Today is not Friday.

6. a. Many over-the-counter medicines are expensive.

b. Many over-the-counter medicines are not expensive.

▲ 7. a. Hillary ran a better campaign than Marco.

b. Marco ran a better campaign than Hillary.

8. a. The Bible is divinely inspired writing.

b. The Koran is divinely inspired writing.

9. a. The Bible is the only divinely inspired writing.

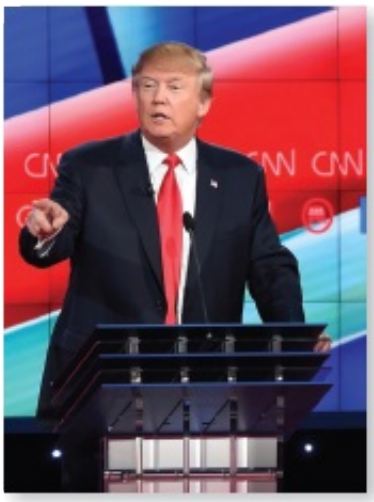
b. The Koran is the only divinely inspired writing.

▲ 10. a. All Dobermans are aggressive.

b. My dog is a Doberman and he is not aggressive.

CONSISTENCY AND INCONSISTENCY

How many times have you heard a politician accused of doing a "flip-flop"? The term is used to describe politicians who have changed their position on something. But what is so bad about flip-flopping? Aren't you ever supposed to change your mind? Page 231 We'll look at that question in a moment, but first let's get a couple of simple concepts clear. A group of beliefs is *consistent* if, and only if, it is possible that each and every one of them is true at the same time. A group of beliefs is *inconsistent* if and only if it *isn't* possible for all of them to be true at the same time.



An individual claim is also consistent or inconsistent. It is consistent if it is at least *possible* for it to be true, and it is inconsistent if it simply cannot be true—in which case it is *self-contradictory*. "It is raining on my window as I write this" is a consistent statement. It is false, but it at least could be true. But "it is raining on my window as I write this and it is not raining on my window as I write this" is self-contradictory.

Now, let's remind ourselves that knowing that a *person* has been inconsistent does

not tell us a thing about his or her *position*. To think that it does is to commit an *argumentum ad hominem*, as explained on pages 174–176. Flip-flopping is *never* a reason for thinking that the person's *position* is defective. An inconsistent position is unacceptable, but the position of an inconsistent person might not be.

Exercise 8-2

In early 2013, Senator Rand Paul was questioning Kathleen Hogan in a Senate Energy and Natural Resources hearing. Among his remarks was a charge of inconsistency: "You favor choice in the matter of a woman's right to an abortion, but you don't favor a woman's or a man's right to choose what kind of light bulb, what kind of dishwasher or washing machine [they will buy]." Evaluate whether the inconsistency charge is reasonable.

MISCALCULATING PROBABILITIES

In this section, we examine four mistakes people sometimes make when they calculate probabilities.

Incorrectly Combining the Probability of Independent Events

Sometimes people make a mistake when they combine the probability of unrelated events. For example:

> Bill's chances of becoming a professional football player are about 1 in 1,000, and Hal's chances of becoming a professional hockey player are about 1 in 5,000. So the chance of both of them becoming professionals in their respective sports is about 1 in 6,000.

The conclusion is incorrect. The two events—Bill's becoming a professional football player and Hal's becoming a professional hockey player—are independent events. One *independent event* cannot affect the outcome of another; whether one happens does not change the probability of the other. When we gauge the probability of two independent events, we multiply their two individual probabilities. So, to find the probability of Bill and Hal both becoming professionals, we multiply 1/1,000 times 1/5,000. The probability of both making pro teams is thus 1 in 5,000,000. We hope they have backup plans.

Gun Owners and the Second Amendment

Possibly 100% of gun owners support the right to bear arms. What is the probability that someone who supports the right to bear arms owns a gun? You would need to know what percent of people who don't own guns support the right to bear arms as well as the base rate or "prior probability" of gun ownership. This is explained in the text.

Another example of the same mistake:

Since there are six sides on a die, the chances of rolling a 1 (a "snake eye") are 1 in 6. Therefore, the chances of rolling two of them in a row are 2 in 12.

Nope. These events are independent, so we multiply $^1/_6$ times $^1/_6$ and we get $^1/_{36}$. The chances of two consecutive snake eyes are 1 in 36, or a little less than 3 percent.

The principles behind combining probabilities will be further explained in **Chapter 11**.

Gambler's Fallacy

The *Gambler's Fallacy* is a common and seductive mistake that happens when we don't realize that independent events *really are independent*. Like this speaker:

The last three coin flips have all been heads, so the next flip is more likely to come up tails.

It's true that four heads in a row is fairly unlikely ($^1/_2 \times {}^1/_2 \times {}^1/_2 \times {}^1/_2 = {}^1/_{16}$ or 6.25 percent), but once the first three heads have come up, the odds of the fourth flip coming up heads is still 1 in 2, that is, 50 percent. Remember when dealing with independent events: past history has no effect.

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Overlooking Prior Probabilities

The **prior probability** of something is its probability everything else being equal. (What that last phrase means should be clear in a moment.) The prior probability of a coin flip coming up heads is 1 in 2, or .5. The prior probability of a given newborn baby's being male is also .5, since about 50 percent of newborns are male. If 20 percent of the students at your college are business majors, then the prior probability of any given student at your college being a business major is .2, or 2 in 10.

The fallacy of **Overlooking Prior Probabilities** occurs when someone fails to take these underlying probabilities into account. Here's an example:

> Bill is the best football player in our high school, and Hal is the best hockey player in our high school. So it appears that Bill's chances of becoming a professional football player and Hal's chances of becoming a professional football player are equally good.

What is overlooked here is that the prior probability of someone's becoming a professional football player is greater than the prior probability of someone's becoming a professional hockey player. Now you can see what we meant earlier by "everything else being equal." Bill has a 1/1,000 chance to play pro ball, let's say, presuming he has the same chance as any other player at his level. If Bill were a high school All-American, that would improve his chances, but then "everything else" would not be equal—he would have an odds advantage over other players. Similarly, if the dice we are rolling are loaded, the prior probabilities of a given number coming up will change, since not all the numbers will have an equal chance of coming up.

Faulty Inductive Conversion

Information about the percentage of As that are Bs does not in itself tell you anything about the percentage of Bs that are As. Those who think it does are guilty of a **Faulty Inductive Conversion,** the fourth mistake people sometimes make when they calculate probabilities.

Here is an example:

Most professional football players are men.
Therefore, most men are professional football players.

Here is another example:

Almost everyone who has Alzheimer's disease once ate carrots.
Therefore, eating carrots makes it more likely that you will get Alzheimer's disease.

These examples are so obviously mistaken nobody would be fooled by them. Here, however, is a less obvious example:

Ten percent of the students living in the dorm came down with a stomach ailment, and most of them ate at the student union. It seems wise to steer clear of student union food.

Our speaker fears the food at the student union, because most of the dorm students who fell ill ate it. He or she thinks eating the food at the student union is apt to cause illness.

But what if most of the students in the dorm who *didn't* fall ill also ate at the student union?

Let's presume the following numbers: The dorm (let us say) has 100 students. Thus ten became ill and ninety didn't. Let's say that seven of the ten dorm residents who became ill ate at the student union. But let's also suppose that 70 percent of the ninety dorm residents who *didn't* fall ill also ate at the student union. That's an additional sixty-three students who ate student union food. So a total of seventy students ate student union food, and only six of them fell ill. That means that only 8.5 percent of the people who ate student union food fell ill. Nothing in these facts should make our speaker leery of dining at the student union.

One more example:

Sam's parents have learned that, at Blue Mountain State, 60 percent of students on academic probation (AP) party every week. Sam, who attends Blue Mountain, has confided that her sorority hosts a party every Friday. Her parents worry that this makes it more likely she will end up on AP.

Sam's parents are guilty of a faulty inductive conversion, jumping from the fact that most AP students party to the conclusion that partying increases a student's

chances of ending up on AP. Sam's parents need more information. Specifically, they need to know what percentage of Blue Mountain students who are *not* on AP party every week, and what percentage of Blue Mountain students are on AP in the first place. For all they know, Sam's parents should be encouraging her to party.

Don't believe it? Let's say only 10 percent of Blue Mountain students are on AP. That means that, out of every 100 students at Blue Mountain, ninety are *not* on AP. Suppose now that of these ninety students who are *not* on AP, 60 percent—fifty-four students—party every week. Now we have the situation that fifty-four students who are *not* on AP party every week and six students who *are* on AP party every week. Do the math. At Blue Mountain, a student who parties every week is more apt to *not* be on AP.

So, to repeat, information about the percentage of As that are Bs doesn't by itself tell you anything about the percentage of Bs that are As. You need to know as well the percentage of *not-As* that are Bs, and how many of them there are to begin with. More details coming up in **Chapter 11**.

Exercise 8-3

Show that the reasoning in the next paragraph is unsound based on what you've read in this section.

> The test said I was allergic to cats. It says "yes" 90 percent of the time when people really do have the allergy and it says "yes" 10 percent of the time when people really do not have it. So more than likely I have the allergy, which is unlucky since only 1 percent of the population has this affliction.

Recap

In this chapter, we examined fallacies and mistakes in reasoning that generally are based on a faulty argument structure or a careless use of language. Specifically, we discussed the following:

- Affirming the consequent—affirming the consequent of an "if . . . then . . ." claim and attempting to infer its antecedent
- Denying the antecedent—denying the antecedent of an "if . . . then . . ." claim and attempting to infer the denial of its consequent

- Undistributed middle—assuming that two things that are related to a third thing must be related to each other
- Equivocation—the use of claims as premises and/or conclusions that contain words or phrases that are interpreted in more than one way
- Amphiboly—the use of claims as premises and/or conclusions that contain ambiguity because of their grammatical structure
- Composition—assuming that what is true of a group of things taken individually must also be true of those same things taken collectively; or assuming that what is true of the parts of a thing must be true of the thing itself
- Division—assuming that what is true of a group of things taken collectively must also be true of those same things taken individually; or assuming that what is true of a whole is also true of its parts
- Confusing explanations and excuses—presuming that, because someone is explaining how or why some event came to pass, he or she is attempting to excuse or justify that event
- Confusing contraries and contradictories—to fail to notice that two conflicting claims can be either contraries (cannot both be true but can both be false) or contradictories (cannot both be true and cannot both be false)
- Consistency and inconsistency—consistency in one's beliefs is a requirement of rationality, but the inconsistency of a person (in changing from one belief to another inconsistent with the first) does not impugn either the previously held belief or the current one
- Incorrectly combining the probabilities of independent events—failing to realize that the probability of several independent events is determined by multiplying the probabilities of the various events
- Gambler's fallacy—believing that the past performance of independent events will have an effect on a further independent event
- Overlooking prior probabilities—failing to take into consideration the likelihood of an event all other things being equal; that is, its likelihood apart from any outside influences
- Faulty inductive conversion—mistakenly thinking that, from information about the percentage of As that are Bs, you can derive a conclusion about the percentage of Bs that are As

Additional Exercises

Exercise 8-4

Here are 106 examples of the fallacies discussed in this chapter. Match each item to one or more of the following categories or otherwise answer as indicated:

a. affirming the consequent
b. denying the antecedent
c. undistributed middle fallacy
d. confusing explanations with excuses
e. equivocation
f. composition
g. division
h. miscalculating probabilities

Note

Your instructor may or may not ask you to further assign miscalculating probabilities into the following subcategories: Incorrectly combining the probabilities of independent events, the gambler's fallacy, overlooking prior probabilities, and faulty inductive conversion.

▲ 1. Professor Parker can tell you if you are sick; after all, he is a doctor.

2. If this man is the president, then he believes in immigration reform. If this man is vice president, then he believes in immigration reform. Therefore, if this man is president, then he is vice president.

3. If global warming is for real, then the mean global temperature will have risen over the past ten years. And that is what happened. Therefore, global warming is for real.

4. My chance of being born on December 25 was the same as yours. So the chances we were both born on December 25 have to be twice as good.

▲ 5. Sodium is deadly poisonous, and so is chlorine. Salt consists of sodium and chlorine, which must be why we're told not to eat too much of it.

6. The Bible commands you to leave life having made the world a better place. And therefore it commands you to make the world a better place each and every day.

7. A dialogue:

   JILL: Helen has her mother's eyes.

   BILL: Good lord! Can the woman still see?

8. Is an explanation clearly being offered as an excuse/justification? I didn't buy tickets to see Chris Angel's show because I heard that he spends half his act with his shirt off strutting around in front of the ladies in the audience.
9. If Congress changes marijuana from a Class 1 drug to something lesser, next year the penalties for possession will be much less than they are now. But Congress is not going to declassify marijuana anytime soon. So we'll have to live with the drastic penalties for at least another year.

▲ 10. If you are rich, then your car is something like a Mercedes or a Bentley. Oh! Is that your Bentley, you rich old thing, you?

11. Man! Three sons in a row? Your next kid is bound to be a girl.

12. The design team for the new project is made up of the best designer from each division of the company. So you know it is the best design team ever.
13. I like cranberry juice and I like beer. So I'm going to buy a case of this new thing, cranberry beer.
14. Voters overwhelmingly approved the reelection of Barack Obama. Therefore, Sean Hannity overwhelmingly approved the reelection of Barack Obama.

▲ 15. Anybody who is serious about losing weight will go on a low-carbohydrate diet. Since Jerry is now on such a diet, that tells me he's serious about losing weight.

16. George, you will have only a small probability of Alzheimer's disease if you study a language, play a musical instrument, or work puzzles. Unfortunately, you don't do any of these things, so you aren't going to lower your chances of Alzheimer's.
17. If bankers were honest, they'd turn back the bonuses they got when their companies were going broke. But they're not honest, so you know they won't turn back those bonuses.
18. If you filed before the first, then we received your taxes on time, which we did. See how nice it is to file before the first?
19. I'll bet the Baltimore Ravens lose the coin toss today. The last Super

Bowl they were in, they won it, remember?

▲ 20. Tyrannosaurs probably ate more of their fellow creatures than any other dinosaurs. After all, they were the largest carnivores on the planet during the Cretaceous period.

21. If anybody in the race can raise their speed by four miles per hour, they will surely win the race. So, if everybody in the race can raise their speed by four miles per hour, they can all win the race!

22. I know I gave more in taxes this year! The federal government collected about $2.4 trillion in taxes this year, and that's more than ever before in history.

23. Child molesters are inhuman. So I think it's perfectly acceptable to punish them any way we want because they are not really human.

24. Is an explanation clearly being offered as an excuse/justification? Under pressure from members of Congress, the administration said it uses drones against some American citizens in the Middle East because they present a terrorist threat to this country. "An American who has gone over to the other side, and who wants to harm us and our allies, is just as much an enemy as a foreign national would be," a spokesperson said. "When he agreed to attack or plan to attack this country, he gave up his rights as a citizen."

▲ 25. All the hotels in the Southwest chain are known for their elaborate lobbies and spectacular lobby bars. The Arlington has a fantastic lobby and a great lobby bar, which makes me believe it's a Southwest hotel.

26. Joel will automatically be accepted provided he got his forms in on time. Unfortunately, though, he did not get his forms in on time, so he won't be automatically accepted.

27. If a Mosquito Magnet actually works, then there won't be any bugs around here, and there aren't. So it works.

28. I need more insurance. Chances are I won't get in a car accident, and chances are my house won't burn down, but between the two of them the odds are one might happen.

29. A couple dozen great singers came to the audition. Just think of what a great chorus they would make.

▲ 30. Mercedes-Benz is the most expensive car line in the world, on average. Therefore, its top-of-the-line model will be more expensive than the top-of-the-line Bentley.

31. Sucrose is a necessary nutrient. Without it the body cannot generate

energy. So, since sucrose is sugar, it is important to have a sufficient amount of sugar in your diet.

32. Is an explanation clearly being offered as an excuse/justification? Billy behaves poorly in restaurants because he's a little kid. What would you expect?

33. Dooley wants to conserve clean air and water. If that doesn't make him a conservative, I don't know what does.

34. All German shepherds are dogs, and some dogs are trained to attack people. Therefore, some German shepherds are trained to attack people.

▲ 35. If the government response to Hurricane Sandy is large enough and fast enough, then New Jersey and the surrounding area will avoid years of economic hard times. But there is no chance its response will be both big enough and fast enough. Therefore, there will be years of hard times in that part of the country.

36. Is this an explanation or an excuse/justification? You shouldn't condemn bullfighting on account of the bulls' well-being. After all, the bulls that enter the ring have had lives that are many times better than the cattle that are raised to be killed in slaughterhouses.

37. With college board scores like these, Charles can probably get into Princeton as easily as State.

38. Is an explanation clearly being offered as an excuse/justification? Tiger Woods isn't winning tournaments like he once was because he has messed with his golf swing too many times.

39. Small pieces of litter are barely visible; therefore, as long as you throw out only small pieces of litter, there shouldn't be a problem.

▲ 40. Rare diseases are very common and hemophagocytic lymphohistiocytosis is a rare disease. Therefore, you should be on the lookout for it.

41. The paint store is the best place to work on your diet. You can get thinner there.

42. Is an explanation clearly being offered as an excuse/justification? When former candidate for vice president John Edwards was asked why he did not favor gay marriage, he replied, "I don't know. It was just the way I was raised, I guess."

43. All feral cats are wild creatures, and many wild creatures cannot be successfully socialized. Therefore, many feral cats cannot be

successfully socialized.

44. If she hates her parents as much as she says, she has her own apartment. She doesn't hate her parents as much as she says. Therefore, she does not have her own apartment.

▲ 45. Everybody who can legally drink in this state is twenty-one or older. Sally is twenty-one or older. Therefore, she can legally drink.

46. Most Parkinson's disease victims were once wine drinkers; therefore, drinking wine raises your chances of having Parkinson's disease.

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47. Lightning struck that barn a year ago, and everybody knows lightening never strikes twice in the same spot. So the barn is safe.

48. Each individual has the right to be heard. Therefore, our group has the right to be heard.

49. Sandra has had some bad arthritis in her left hand. But, on the other hand, she's just fine.

▲ 50. Is an explanation clearly being offered as an excuse/justification? It's true, Geoffrey said some very unpleasant things to some of the people at the table last night. But that's because he's had a lot to drink and he really doesn't hold his liquor all that well. He's a completely different person when he's sober.

51. Is an explanation clearly being offered as an excuse/justification? Well, yes, I read Christine's diary—but that's because, good grief, she read mine!

52. All members of the club have strong views, and all the men in this community have strong views. So all the men in this community are members of the club.

53. If you are not twenty-one or older, then it is not legal for you to drink. You are twenty-one. Therefore, it is legal for you to drink.

54. If Sally is over twenty-one, then she can legally drink. Sally can legally drink. Therefore, she is over twenty-one.

▲ 55. If it is legal for Sally to drink, then she is twenty-one or older. It is not legal for Sally to drink. Therefore, she is not twenty-one or older.

56. If Sally is over twenty-one, then it is legal for her to drink. Sally is not over twenty-one. Therefore, it is not legal for her to drink.

57. Posey hit two home runs in the last game, so you know he's on track to hit at least one today.

58. Is the speaker viewing an explanation as an excuse/justification?

Her car broke down is why she says she isn't here? Why does she try to duck her responsibilities all the time?

59. Virtually every heroin addict once smoked marijuana. Therefore, your chances of becoming a heroin addict are increased if you smoke marijuana.

▲ 60. Water is liquid. Water consists of hydrogen and oxygen molecules. Therefore, hydrogen and oxygen molecules are liquid.

61. Somebody drilled a hole in the nudist camp wall. The police are looking into it.

62. Is an explanation clearly being offered as an excuse/justification? Monica was unable to take the test today because she was very ill with the flu and a high fever.

63. Jackson believes in democracy—you know, let the voters decide. And as a Democrat he will support whomever the party decides to nominate.

64. If she passed the course, she is very bright. If she did well on the final, she is very bright. Therefore, if she did well on the final, she passed the course.

▲ 65. If a person dropped out of college, that person will not make much money. Chris doesn't make much money. Therefore, he dropped out of college.

66. Is an explanation clearly being offered as an excuse/justification? Dinner is late because I had to work late is why, so don't get on my case.

67. Don't worry about your recital tonight. Every note sounds great on a Steinway.

68. Laura's physics class came out with an A-minus average on the exam. She has to be a smart cookie to do so well in such a difficult class.

69. The sign at the drug rehabilitation center said "Keep off the grass." They're even doing propaganda out in the yard!

▲ 70. In my child's class there are thirty students, and ten of them got flu shots this year. Five of the kids who got shots wound up getting the flu. The shots were a bad idea: kids were just as likely to get the flu as not, even after their shots!

71. You say he's had his fill of flies? Gross. Does he eat rats, too?

72. She wouldn't have said it if she didn't believe it. And she didn't do it

if she didn't believe it. Therefore, she wouldn't have said it if she didn't do it.

73. This zinfandel would have a smooth finish if it came from very old vines. In fact, it does have a smooth finish, so it came from very old vines.

74. Nearly all advanced prostate cancer victims have elevated PSA levels. Therefore, if you have an elevated PSA level, you probably have advanced prostate cancer.

▲ 75. Is SUE clearly offering an explanation as an excuse/justification?

SUE: I'm sorry, Mom. I really didn't know I was supposed to be home by ten.

SUE'S MOM: Stop making excuses, Sue!

76. I read somewhere that Ford owners buy lots more gas than Chrysler and Jeep owners put together. So Chryslers and Jeeps must get better mileage.

77. "The sign said 'Fine for parking here' so I parked there. And damned if I didn't get a ticket. Don't they follow their own rules?"

—Steven's Guide

78. The menu said, "Soup or salad and dessert." So I asked for salad and desert.

79. If you like Ayn Rand, you are a libertarian. And, of course, if you're an anarchist, you're a libertarian. Therefore, if you like Ayn Rand, you are an anarchist.

▲ 80. It's true, if Ms. Presson is accepted into law school, then you know she had to have very good grades. And I'm telling you, you should see her transcript; she's made straight As for the past two years. So I wouldn't worry about her being accepted into law school; she'll be accepted without a doubt.

81. Most straight-A students own cell phones. Obviously owning a cell enhances learning.

82. They told me their computers were down, but I am sick and tired of people blaming everything on computer issues.

83. If you aren't wealthy, adding a single dollar to your bank account won't change things. Therefore, single dollars cannot make you wealthy.

84. Councilman Smith says he thinks we should make liberal payouts to local organizations. I knew he was a liberal in conservative's

clothing!

▲ 85. Of course he couldn't see your point. Dude's blind.

86. Everybody who took the exam passed the course, and everybody who did an outside project passed the course too. So everybody who did an outside project took the exam.

87. If global warming is for real, then the mean global temperature would have risen over the past ten years. Global warming is not for real. Therefore, the mean global temperature didn't rise over the past ten years.

88. Don't play that number. It won the lottery last week!

89. He can lift every weight in that stack; therefore, he can lift the entire stack.

▲ 90. The chance of rain in Washington, D.C., tomorrow is 50% and it's 50% in London too. So we're pretty much 100% sure to get rain in one capital or the other.

91. Well, as you know, if you had taken aspirin daily, your blood would have become thinner. According to your latest blood test, you have no problem in that department, so I conclude that you've been taking aspirin.

92. MARINA: Given how harsh he was, it was wrong for us to support the Shah.

OLIVIA: Well, he was harsh because strong measures were needed to improve his country's economy. Given his motives, he did not act immorally.

Is OLIVIA's explanation being offered to justify the Shah's harsh measures?

93. I've always wondered how they could breathe, there on the Underground Railway.

94. All mammals bear their young live. Guppies also bear their young live. So, surprisingly, guppies must be mammals.

▲ 95. When James gets the paper on the porch every day, Mr. Fields gives him a small tip at the end of the month. I noticed he gave him a tip yesterday, so James was doing a good job of getting the paper on the porch.

96. The chances of my bus to the airport being late is about 50 percent, but the chance of my flight taking off late is also about 50 percent.

So together the chance of them happening is 100 percent.

97. The San Francisco Giants won the World Series. No way the San Francisco 49ers won the Super Bowl the same year!

98. Smoke from a single fireplace can hardly pollute the air; therefore, people should be able to use their fireplaces anytime they want.

99. That field of flowers is really colorful. Some of the plants in there are hostas; they must be quite colorful.

▲ 100. I'll tell you right now, Horace. No daughter of mine is going to work in a strip mall.

101. Is an explanation clearly being offered as an excuse/justification? No surprise that pit bulls are involved in more attacks on people than most other breeds. I mean, after all, those dogs are bred to be aggressive and to fight. That was the whole point of the breed.

102. If it weren't for a gerrymandered district, our local congressperson would never be reelected. Therefore, since the district is gerrymandered, our person will be elected again.

103. If you had cooked this meat for at least three hours, it would be tender enough to go in the stew. But you cooked it for only two hours, so it won't be tender enough.

104. Given the number of tickets I bought, I have a 33 percent chance of winning a raffle prize, and Bill also has a 33 percent chance, and Juanita has a 33 percent chance too. So one of us is bound to win something!

▲ 105. I read that tiger mosquitos are spreading across the country more rapidly than any other type. I'm thinking they must be able to fly faster than other mosquitos.

106. A dialogue:

JILL: Professor Heinz is delivering a paper to a scientific meeting.

BILL: The *Post* or the *Times?*