

# LOGICAL FLAWS



# WHAT IS LOGICAL FLAWS?



A flaw in something such as a theory or argument is a mistake in it, which causes it to be less effective or valid.



# FALLACY



# WHAT IS FALLACIES?



It is reasoning that is logically incorrect, undermines the logical validity of an argument, or is recognized as unsound. All forms of human communication can contain fallacies.



# LOGICAL FALLACIES

# WHAT IS A LOGICAL FALLACIES?



Those logical gaps that invalidate arguments -- aren't always easy to spot.



# WHAT IS A LOGICAL FALLACIES?



Logical fallacies are like tricks or illusions of thought, and they're often very sneakily used by politicians and the media to fool people.





# Common Logical Fallacies

## I) THE STRAW MAN FALLACY

This fallacy occurs when your opponent oversimplifies or misrepresents your argument (i.e., setting up a "straw man") to make it easier to attack or refute.



## I) THE STRAW MAN FALLACY

Instead of fully addressing your actual argument, speakers relying on this fallacy present a superficially similar -- but ultimately not equal -- version of your real stance, helping them create the illusion of easily defeating you.



## I) THE STRAW MAN FALLACY

By exaggerating, misrepresenting, or just completely fabricating someone's argument, it's much easier to present your own position as being reasonable, but this kind of dishonesty serves to undermine honest rational debate.



# I) THE STRAW MAN FALLACY



Example:

John: I think we should hire someone to redesign our website.

Lola: You're saying we should throw our money away on external resources instead of building up our in-house design team? That's going to hurt our company in the long run.



# I) THE STRAW MAN FALLACY



Example:

After Will said that we should put more money into health and education, Warren responded by saying that he was surprised that Will hates our country so much that he wants to leave it defenceless by cutting military spending.



## 2) THE BANDWAGON FALLACY



Just because a significant population of people believe a proposition is true, doesn't automatically make it true.

Popularity alone is not enough to validate an argument, though it's often used as a standalone justification of validity.



## 2) THE BANDWAGON FALLACY



Arguments in this style don't take into account whether or not the population validating the argument is actually qualified to do so, or if contrary evidence exists.



## 2) THE BANDWAGON FALLACY



While most of us expect to see bandwagon arguments in advertising (e.g., "three out of four people think X brand toothpaste cleans teeth best"), this fallacy can easily sneak its way into everyday meetings and conversations.



## 2) THE BANDWAGON FALLACY



Example:

The majority of people believe advertisers should spend more money on billboards, so billboards are objectively the best form of advertisement.



### 3) THE APPEAL TO AUTHORITY FALLACY



While appeals to authority are by no means always fallacious, they can quickly become dangerous when you rely too heavily on the opinion of a single person -- especially if that person is attempting to validate something outside of their expertise.



### 3) THE APPEAL TO AUTHORITY FALLACY



Getting an authority figure to back your proposition can be a powerful addition to an existing argument, but it can't be the pillar your entire argument rests on. Just because someone in a position of power believes something to be true, doesn't make it true.



### 3) THE APPEAL TO AUTHORITY FALLACY



Example:

Despite the fact that our Q4 numbers are much lower than usual, we should push forward using the same strategy because our CEO Barbara says this is the best approach.



## 4) THE FALSE DILEMMA FALLACY



This common fallacy misleads by presenting complex issues in terms of two inherently opposed sides.

Instead of acknowledging that most (if not all) issues can be thought of on a spectrum of possibilities and stances, the false dilemma fallacy asserts that there are only two mutually exclusive outcomes.



## 4) THE FALSE DILEMMA FALLACY



This fallacy is particularly problematic because it can lend false credence to extreme stances, ignoring opportunities for compromise or chances to re-frame the issue in a new way.



## 4) THE FALSE DILEMMA FALLACY

Example:

We can either agree with Barbara's plan, or just let the project fail. There is no other option.



## 5) THE HASTY GENERALIZATION FALLACY



This fallacy occurs when someone draws expansive conclusions based on inadequate or insufficient evidence. In other words, they jump to conclusions about the validity of a proposition with some -- but not enough -- evidence to back it up, and overlook potential counterarguments.



## 5) THE HASTY GENERALIZATION FALLACY



Example:

Two members of my team have become more engaged employees after taking public speaking classes. That proves we should have mandatory public speaking classes for the whole company to improve employee engagement.



## 6) THE SLOTHFUL INDUCTION FALLACY



Slothful induction is the exact inverse of the hasty generalization fallacy above. This fallacy occurs when sufficient logical evidence strongly indicates a particular conclusion is true, but someone fails to acknowledge it, instead attributing the outcome to coincidence or something unrelated entirely.



## 6) THE SLOTHFUL INDUCTION FALLACY



Example:

Even though every project Brad has managed in the last two years has run way behind schedule, I still think we can chalk it up to unfortunate circumstances, not his project management skills.



## 7) THE CORRELATION/ CAUSATION FALLACY



If two things appear to be correlated, this doesn't necessarily indicate that one of those things irrefutably caused the other thing.

This might seem like an obvious fallacy to spot, but it can be challenging to catch in practice -- particularly when you really want to find a correlation between two points of data to prove your point.



## 7) THE CORRELATION/ CAUSATION FALLACY



Example:

Our blog views were down in April. We also changed the color of our blog header in April. This means that changing the color of the blog header led to less views in April.



## 8) THE ANECDOTAL EVIDENCE FALLACY



In place of logical evidence, this fallacy substitutes examples from someone's personal experience.

Arguments that rely heavily on anecdotal evidence tend to overlook the fact that one (possibly isolated) example can't stand alone as definitive proof of a greater premise.



## 8) THE ANECDOTAL EVIDENCE FALLACY



Example:

One of our clients doubled their conversions after changing all their landing page text to bright red. Therefore, changing all text to red is a proven way to double conversions.



## 9) THE TEXAS SHARPSHOOTER FALLACY



This fallacy gets its colorful name from an anecdote about a Texan who fires his gun at a barn wall, and then proceeds to paint a target around the closest cluster of bullet holes. He then points at the bullet-riddled target as evidence of his expert marksmanship.



## 9) THE TEXAS SHARPSHOOTER FALLACY



Speakers who rely on the Texas sharpshooter fallacy tend to cherry-pick data clusters based on a predetermined conclusion. Instead of letting a full spectrum of evidence lead them to a logical conclusion, they find patterns and correlations in support of their goals, and ignore evidence that contradicts them or suggests the clusters weren't actually statistically significant.



## 9) THE TEXAS SHARPSHOOTER FALLACY



Example:

Lisa sold her first startup to an influential tech company, so she must be a successful entrepreneur. (She ignores the fact that four of her startups have failed since then.)



## 10) THE MIDDLE GROUND FALLACY



This fallacy assumes that a compromise between two extreme conflicting points is always true.

Arguments of this style ignore the possibility that one or both of the extremes could be completely true or false -- rendering any form of compromise between the two invalid as well.



## 10) THE MIDDLE GROUND FALLACY



Example:

Lola thinks the best way to improve conversions is to redesign the entire company website, but John is firmly against making any changes to the website. Therefore, the best approach is to redesign some portions of the website.



## 10) THE MIDDLE GROUND FALLACY



Example:

Holly said that vaccinations caused autism in children, but her scientifically well-read friend Caleb said that this claim had been debunked and proven false. Their friend Alice offered a compromise that vaccinations must cause some autism, just not all autism.



## II) THE BURDEN OF PROOF FALLACY

The burden of proof lies with someone who is making a claim, and is not upon anyone else to disprove. The inability, or disinclination, to disprove a claim does not render that claim valid, nor give it any credence whatsoever.



## II) THE BURDEN OF PROOF FALLACY



However it is important to note that we can never be certain of anything, and so we must assign value to any claim based on the available evidence, and to dismiss something on the basis that it hasn't been proven beyond all doubt is also fallacious reasoning.



## II) THE BURDEN OF PROOF FALLACY



If a person claims that X is true, it is their responsibility to provide evidence in support of that assertion. It is invalid to claim that X is true until someone else can prove that X is not true. Similarly, it is also invalid to claim that X is true because it's impossible to prove that X is false.



## II) THE BURDEN OF PROOF FALLACY

In other words, just because there is no evidence presented against something, that doesn't automatically make that thing true.



## II) THE BURDEN OF PROOF FALLACY



Example:

Barbara believes the marketing agency's office is haunted, since no one has ever proven that it isn't haunted.



## II) THE BURDEN OF PROOF FALLACY



Example:

Bertrand declares that a teapot is, at this very moment, in orbit around the Sun between the Earth and Mars, and that because no one can prove him wrong, his claim is therefore a valid one.



## 12) THE PERSONAL INCREDOULITY FALLACY



If you have difficulty understanding how or why something is true, that doesn't automatically mean the thing in question is false.

A personal or collective lack of understanding isn't enough to render a claim invalid.



## 12) THE PERSONAL INCREDOULITY FALLACY



Complex subjects like biological evolution through natural selection require some amount of understanding before one is able to make an informed judgement about the subject at hand; this fallacy is usually used in place of that understanding.



## 12) THE PERSONAL INCREDOULITY FALLACY



Example:

I don't understand how redesigning our website resulted in more conversions, so there must have been another factor at play.



## 12) THE PERSONAL INCREDOULITY FALLACY



Example:

Kirk drew a picture of a fish and a human and with effusive disdain asked Richard if he really thought we were stupid enough to believe that a fish somehow turned into a human through just, like, random things happening over time.



## 13) THE "NO TRUE SCOTSMAN" FALLACY



Often used to protect assertions that rely on universal generalizations (like "all Marketers love pie") this fallacy inaccurately deflects counterexamples to a claim by changing the positioning or conditions of the original claim to exclude the counter example.



## 13) THE "NO TRUE SCOTSMAN" FALLACY

In other words, instead of acknowledging that a counterexample to their original claim exists, the speaker amends the terms of the claim.



## 13) THE "NO TRUE SCOTSMAN" FALLACY



Example:

John: No marketer would ever put two call-to-actions on a single landing page.

Barbara: Lola, a marketer, actually found great success putting two call-to-actions on a single landing page for our last campaign.

John: Well, no true marketer would put two call-to-actions on a single landing page, so Lola must not be a true marketer.



## 13) THE "NO TRUE SCOTSMAN" FALLACY



In the example, when Barabara presents a valid counterexample to John's claim, John changes the terms of his claim to exclude Barabara's counterexample.





## 14) THE TU QUOQUE FALLACY

The *tu quoque* fallacy (Latin for "you also") is an invalid attempt to discredit an opponent by answering criticism with criticism -- but never actually presenting a counterargument to the original disputed claim.



## 14) THE TU QUOQUE FALLACY



Example:

Lola: I don't think John would be a good fit to manage this project, because he doesn't have a lot of experience with project management.

John: But you don't have a lot of experience in project management either!





## 14) THE TU QUOQUE FALLACY



In the example, Lola makes a claim. Instead of presenting evidence against Lola's claim, John levels a claim against Lola. This attack doesn't actually help John succeed in proving Lola wrong, since he doesn't address her original claim in any capacity.

## 15) THE FALLACY FALLACY

You presumed that because a claim has been poorly argued, or a fallacy has been made, that the claim itself must be wrong.



## 15) THE FALLACY FALLACY



Making a fallacy-riddled claim doesn't automatically invalidate the premise of the argument -- it just means the argument doesn't actually validate their premise. In other words, their argument sucks, but they aren't necessarily wrong.



## 15) THE FALLACY FALLACY



Example:

John's argument in favor of redesigning the company website clearly relied heavily on cherry-picked statistics in support of his claim, so Lola decided that redesigning the website must not be a good decision.



## 15) THE FALLACY FALLACY



Example:

Recognising that Amanda had committed a fallacy in arguing that we should eat healthy food because a nutritionist said it was popular, Alyse said we should therefore eat bacon double cheeseburgers every day.



## 16) FALSE CAUSE

You presumed that a real or perceived relationship between things means that one is the cause of the other.



## 16) FALSE CAUSE



Many people confuse correlation (things happening together or in sequence) for causation (that one thing actually causes the other to happen). Sometimes correlation is coincidental, or it may be attributable to a common cause.



## 16) FALSE CAUSE



Example:

Pointing to a fancy chart, Roger shows how temperatures have been rising over the past few centuries, whilst at the same time the numbers of pirates have been decreasing; thus pirates cool the world and global warming is a hoax.



## 17) AD HOMINEM

You attacked your opponent's character or personal traits in an attempt to undermine their argument.



## 17) AD HOMINEM



Ad hominem attacks can take the form of overtly attacking somebody, or more subtly casting doubt on their character or personal attributes as a way to discredit their argument.



## 17) AD HOMINEM

The result of an ad hom attack can be to undermine someone's case without actually having to engage with it.



## 17) AD HOMINEM



Example:

After Sally presents an eloquent and compelling case for a more equitable taxation system, Sam asks the audience whether we should believe anything from a woman who isn't married, was once arrested, and smells a bit weird.



## 18) COMPOSITION/ DIVISION

You assumed that one part of something has to be applied to all, or other, parts of it; or that the whole must apply to its parts.



## 18) COMPOSITION/ DIVISION



Often when something is true for the part it does also apply to the whole, or vice versa, but the crucial difference is whether there exists good evidence to show that this is the case. Because we observe consistencies in things, our thinking can become biased so that we presume consistency to exist where it does not.



## 18) COMPOSITION/ DIVISION



Example:

Daniel was a precocious child and had a liking for logic. He reasoned that atoms are invisible, and that he was made of atoms and therefore invisible too. Unfortunately, despite his thinky skills, he lost the game of hide and go seek.





## 19) NO TRUE SCOTSMAN

You made what could be called an appeal to purity as a way to dismiss relevant criticisms or flaws of your argument.





## 19) NO TRUE SCOTSMAN

In this form of faulty reasoning one's belief is rendered unfalsifiable because no matter how compelling the evidence is, one simply shifts the goalposts so that it wouldn't apply to a supposedly 'true' example.



This kind of post-rationalization is a way of avoiding valid criticisms of one's argument.

## 20) GENETIC



You judged something as either good or bad on the basis of where it comes from, or from whom it came.



## 20) GENETIC



This fallacy avoids the argument by shifting focus onto something's or someone's origins. It's similar to an ad hominem fallacy in that it leverages existing negative perceptions to make someone's argument look bad, without actually presenting a case for why the argument itself lacks merit.



## 20) GENETIC



Accused on the 6 o'clock news of corruption and taking bribes, the senator said that we should all be very wary of the things we hear in the media, because we all know how very unreliable the media can be.





## 21) BLACK-OR-WHITE

You presented two alternative states as the only possibilities, when in fact more possibilities exist.





## 21) BLACK-OR-WHITE



Also known as the false dilemma, this insidious tactic has the appearance of forming a logical argument, but under closer scrutiny it becomes evident that there are more possibilities than the either/or choice that is presented.



## 21) BLACK-OR-WHITE



Binary, black-or-white thinking doesn't allow for the many different variables, conditions, and contexts in which there would exist more than just the two possibilities put forth. It frames the argument misleadingly and obscures rational, honest debate.

## 22) BEGGING THE QUESTION

You presented a circular argument in which the conclusion was included in the premise.



## 22) BEGGING THE QUESTION



This logically incoherent argument often arises in situations where people have an assumption that is very ingrained, and therefore taken in their minds as a given. Circular reasoning is bad mostly because it's not very good.



## 22) BEGGING THE QUESTION



Example:

The word of Zorbo the Great is flawless and perfect. We know this because it says so in The Great and Infallible Book of Zorbo's Best and Most Truest Things that are Definitely True and Should Not Ever Be Questioned.



## **23) APPEAL TO NATURE**

You argued that because something is 'natural' it is therefore valid, justified, inevitable, good or ideal.



## 23) APPEAL TO NATURE



Example:

The medicine man rolled into town on his bandwagon offering various natural remedies, such as very special plain water. He said that it was only natural that people should be wary of 'artificial' medicines such as antibiotics.





# **7 KEYS to SOLVING LOGICAL FLAW QUESTIONS**

## **Identify the Flaw: Pay attention to the end of the question**

Some Flaw questions will actually give you some “bonus language” at the end of it.

# Identify the Flaw: Example

In Flaw questions, you'll see:

- A full argument in the passage, with a main conclusion and supporting evidence.
- Choices that contain descriptions of different flaws.

Questions of this kind are worded in a variety of ways:

- The reasoning in the argument is flawed because the argument
- The argument commits which one of the following errors of reasoning?
- The argument's reasoning is questionable because the argument fails to rule out the possibility that

*The reasoning above is most vulnerable to criticism on the grounds that it*

# Identify the Flaw: Example

The third example above ends with, “the argument fails to rule out the possibility that”. This clue tells you to be on the lookout for a possibility that the arguer has overlooked. This is a specific kind of flaw, so you already have more information than you would have if the question asked “Which one of the following errors of reasoning does the argument commit?”

You should assume that the argument is defective in some way. Your job is to figure out how, and to select the choice that accurately describes an error or weakness.

# **Identify the Flaw: Pay attention to the end of the question**

Flaw: A reasoning error or defect; a feature of an argument's reasoning that keeps the argument from delivering the degree of support that it claims to deliver for its conclusion.

# **Identifying the difference between a Flaw and Identifying a Weakener**

- When you're asked to identify a weakener, you're essentially finding information in the choices that makes the argument worse than it currently is.
- When you're asked to identify a flaw, you're not adding any information but rather simply describing why the argument as it stands isn't logically strong. In other words, the argument is already unsound.

# **Identifying the difference between a Flaw and Identifying a Weakener: Example**

- I know it's going to rain tomorrow, because I heard a forecast for rain on my favorite radio station.
- If your task were to Identify a Flaw, you could predict, “A problem is that the arguer assumes that the radio station is accurate in its forecasts.”
- If your task were to Identify a Weakener, you could predict, “I’m looking for a choice that shows that the radio station isn’t always accurate in its forecasts.”

Sometimes, to identify a flaw you'll need to identify a way in which you could weaken the argument

# **Identify the conclusion and support.**

A good way to start Flaw questions, as with many other argument-based question types, is to identify the conclusion and the support.

## **Conclusion**

- Reading nutrition labels promotes healthful dietary behavior  
*because*

## **Support**

- The proportion of fat calories in the diets of people who read the nutrition labels on food products is significantly lower than it is in the diets of people who do not read nutrition labels.

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# **Identify the approach to the question**

Tip: Don't question the evidence itself.

Ask yourself, “Given that support, why can’t we arrive at the conclusion that the arguer seems so confident about?” In other words, the support may be true, but does it demonstrate that the conclusion must also be true?

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Sometimes, to identify a flaw you'll need to identify a way in which you could weaken the argument

# **Identifying the difference between a Flaw and Identifying a Weakener: Example**

In other words, having a questionable assumption can make an argument flawed, and attacking that assumption would weaken the argument.

# **Identify the conclusion and support.**

A good way to start Flaw questions, as with many other argument-based question types, is to identify the conclusion and the support.

## **Conclusion**

- Reading nutrition labels promotes healthful dietary behavior  
*because*

## **Support**

- The proportion of fat calories in the diets of people who read the nutrition labels on food products is significantly lower than it is in the diets of people who do not read nutrition labels.

# **Identify the conclusion and support.**

In every flaw question, something goes wrong when the arguer moves from the support to the conclusion, so it's a great idea to separate the two parts of the argument.

# **Identify the conclusion and support.**

Tip: Don't question the evidence itself.

Ask yourself, "Given that support, why can't we arrive at the conclusion that the arguer seems so confident about?" In other words, the support may be true, but does it demonstrate that the conclusion must also be true?

# **Do a quick check for common flaws**

A good next step is to check to see if the argument commits any common fallacies.

To recognize these:

- 1) Familiarize yourself with common flaw types
- 2) Always be on the lookout for common flaws' indicators in an argument's language and content.

# **Do a quick check for common flaws**

Whenever an argument claims something caused something else, ask: “Is there a good reason to believe in this causation, or is the arguer simply taking two events that happen together and trying to link them?”

**"What if?" If you don't find a common fallacy, describe the disconnect between the conclusion and the support in your own words.**

Some arguments are flawed, but not in a common way that's easy to categorize. In these cases, your job is to articulate the flaw in your own words, and then look for the answer you're predicting among the choices.

**"What if?" If you don't find a common fallacy, describe the disconnect between the conclusion and the support in your own words.**

A good way to brainstorm is to look for what-ifs. The goal is to figure out how the conclusion could be false even if all of the support is true. In this case, can you think of a hypothetical in which the study results are misleading?

What if... fat is actually good for you?

What if... the label-readers eat less fat but more sugar?

What if... the people who read labels happen to be make healthier choices, but not because they read labels?

# **Consider assumptions**

A good way to brainstorm is to look for what-ifs. The goal is to figure out how the conclusion could be false even if all of the support is true. In this case, can you think of a hypothetical in which the study results are misleading?

# Consider assumptions: Example

The assumption that eating less fat is healthier. It could be described in a variety of ways:

- The argument assumes, without providing justification, that less fat is healthier.
- The argument takes for granted that less fat is healthier.
- The argument overlooks the possibility that eating more fat isn't necessarily less healthy.
- The argument fails to consider that eating less fat might not be healthier.

# **Consider assumptions: Example**

Notice that the assumption can be described positively or negatively: that X is true, or that the opposite of X is false. So be on the lookout for either formulation when you're anticipating an assumption.

**Identify the choice that matches your prediction; otherwise, eliminate strategically.**

When you have a strong prediction like the one we made above, you can often scan the choices without reading them in full until you find the match for your prediction.

The stronger and more confident your prediction, the faster this process generally is.



# Questions

# Question number 1

Basketball scout: Over the last 25 years, every professional basketball player who was at least 6 feet 6 inches tall could dunk a basketball. Maurice will begin his professional basketball career this coming year and his amateur team lists him as 6 feet 7 inches tall. Thus, Maurice definitely will be able to dunk.

The basketball scout's argument is most vulnerable to which one of the following objections?

# Possible Answers:

- a. The argument misinterprets evidence that a result is likely as evidence that the result is certain.
- b. The argument mistakes a condition sufficient for bringing about a result for a condition necessary for doing so.

# Possible Answers:

- c. The argument relies on data provided by Maurice's amateur team without examining the reliability of such data.
- d. The argument draws a general conclusion about a group based on data about an unrepresentative sample of that group.
- e. The argument infers that a characteristic of a certain subset of basketball players is shared by all basketball players.

# Correct answer:

- a. The argument misinterprets evidence that a result is likely as evidence that the result is certain.

**Question  
number 2**

# Identify the logical fallacy

"We surveyed all the customers in the store and they all agreed that staying open 24 hours would be a great idea. We need to put together a 24-hour schedule as soon as possible."

# **Identify the logical fallacy**

"We surveyed all the customers in the store and they all agreed that staying open 24 hours would be a great idea. We need to put together a 24-hour schedule as soon as possible."

**Answer: The Bandwagon Fallacy.**

# Identify the logical fallacy

"If we allow Susan to leave early, soon we'll be giving everyone Friday afternoon off."

# Identify the logical fallacy

"If we allow Susan to leave early, soon we'll be giving everyone Friday afternoon off."

## Answer: The Slippery Slope

This kind of argument crops up often. But, on closer inspection of the example, you can see that it's illogical to conclude that you will have to give absolutely everyone an afternoon off, every single week, just by allowing one employee to leave early one time.

# Identify the logical fallacy

A local politician plans to expand the municipality's cycle network and to add several new speed cameras in densely populated areas. Their opponent says, "They want us all to give up driving forever. They're punishing the honest car owners and commuters that help pay these politicians' salaries."

# Identify the logical fallacy

## Answer: The Straw Man Fallacy.

By arguing that the proposed changes are an attack on motorists, the opponent has knocked down the position much more easily than if they tried to address the actual concerns the proposal is dealing with – in this case, a spike in fatalities due to traffic collisions and pollution levels.

# Identify the logical fallacy

"We can either agree with Barbara's plan, or just let the project fail. There is no other option."

# **Identify the logical fallacy**

**Answer: The False Dilemma Fallacy.**

# **Identify the logical fallacy**

In place of logical evidence, this fallacy substitutes examples from someone's personal experience.

# Identify the logical fallacy

Answer: The Anecdotal Evidence  
Fallacy.

# THANK YOU!