Types of Logical Flaws

UNIT 4

4.1 CAUSATION VS. CORRELATION

Causation is when one thing directly affects the other. Correlation is when two things have a similar trend but do not directly affect each other.

When we say correlation, there is any observed connection between two claims or two facts, particularly between two two sets of data or trend. For instance, if there were an observed upward trend in violent crime in a city, at a time when sales of violent computer games were on the increase, it would be right to say there was some correlation between two trends. Note that arguments or inferences that assume causal connections from correlations alone are generally flawed. A correlation does not always mean cause and effect. Sometimes two variables appear to correlate, but one does not lead to the other. The correlation might be coincidental or is caused by a third factor.

On the other hand, causation means that one event directly causes another to occur. The first variable may bring the second into existence or may cause the incidence of the second variable to fluctuate.

Causation is often confused with correlation, which indicates the extent to which two variables tend to increase or decrease in parallel. However, correlation by itself does not imply causation. There may be a third factor, for example, that is responsible for the fluctuations in both variables.

Here are some things you can apply to test the relationship between two variables:

- Describe a relationship between two variables.
- Identity statements consistent with the relationship between the variables.
- Identify valid conclusions about correlation and causation.
- Identify a factor that could explain why a correlation does not imply casual relationship.
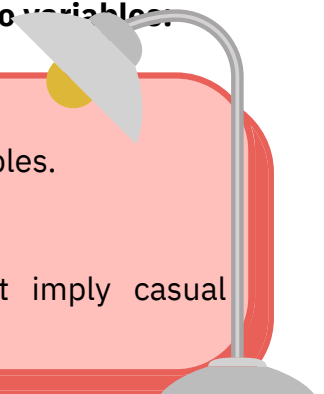
In summary, correlation and causation is an important type of overlooked possibility, in which the arguer takes two things that happen at the same time (correlation) and concludes that one of those things caused the other (causation).

EXAMPLE

This season has been nothing short of a disaster for the Bulldogs. Following an atrocious 2-9 start, the Bulldogs' executive management opted to dismiss head coach Jason Biggums. The very following game, they defeated one of the league's top teams 23-2. Biggums clearly held the squad down, and the change of head coaches made all the difference.

Which of the following best describes the flaw in the above argument?

A. *The apparent link between changing coaches and a victory might be a result of correlation rather than causality.*

B. *The argument derives a broad conclusion from information regarding a single incident.*

C. *The argument anticipates a future occurrence based on past events that may or may not be related to the anticipated event*

D. *This is a judgement based on skewed or inadequate evidence.*

In this question, Students must identify which flaw is present in the stated argument. This is a perfect example of coincidental correlation, as the arguer assumes that just because head coach jason biggums was fired, that he was the only factor that held back the team from doing well. This is not the only factor involved in the team's performance and is not necessarily true. That is why A is the correct answer. This type of fallacy comes up A LOT in exams, and is incredibly important to learn how to identify it quickly and efficiently. The language in the final part of the question is a good clue as it is very definitive. *Biggums clearly held the squad down, and the change of head coaches made all the difference.* If you see this type of language in an argument flaw question, there's a good chance it's going to be correlation vs causation.

4.2 HASTY GENERALISATION

A hasty generalization is a claim based on a few examples rather than substantial proof. Arguments based on hasty generalizations often don't hold up due to a lack of supporting evidence: The claim might be true in one case, but that doesn't mean it's always true.

Hasty generalizations are common in arguments because there's a wide range of what's acceptable for "sufficient" evidence. The rules for evidence can change based on the claim you're making and the environment where you are making it — whether it's rooted in philosophy, the sciences, a political debate, or discussing house rules for using the kitchen.

Supposedly true

Declarative,

Imperative

This is a conclusion based on insufficient or biased evidence. In other words, you are rushing to a conclusion before you have all the relevant facts

EXAMPLE

"I drove a Toyota Camry and it broke down, therefore all Toyota Camrys are unreliable."

Which of the following best describes the flaw in the above argument?

This is a common format for hasty generalisations. 'I did or bought X, therefore all X's are _____'. As soon as you see this sort of language in a question you can be almost certain that it is a hasty generalisation. The answer will NEVER simply state 'the argument is flawed because the arguer made a hasty generalisation.' It will always be somehow related to the stimulus of the question (in this case Toyota Camrys). For example a correct answer to this question would look something like this:

'The arguer makes the mistake of assuming all Toyota Camry's are unreliable based off one bad experience"

Hasty generalisations are often tested, and are very important to know and be able to identify quickly.

4.3 CONFLATION

Conflation is the merging of two or more sets of information, texts, opinions etc. In simple terms, it refers to drawing inappropriate comparisons to two different ideas.

One could argue that conflation is synthesis. There is little in the standard definition to refute that. But the recent popularity of the term has more to do with its role as a **logical fallacy** than its dictionary definition.

As a **logical fallacy**, conflation differs from its standard dictionary entry in the implication that the combining of multiple parts is either unknown or done purposefully to confuse. It is typically what truly stands in contrast and opposition to real and meaningful analysis. Conflation then is very often a failure to analyze or at least analyze well. It is equally often a complete unawareness that further analysis is even required.

EXAMPLE

All Lions roar with power. Airplane engines also roar with power, therefore all aeroplane engines are lions.

'The airplane engine roared with power' is a common expression used in the English language. This argument purposely confuses a lion's roar with an airplane's engine's incredible noise and power to try and justify that since both objects 'roar' they must be the same.

4.4 EQUIVOCATION

Equivocation happens when a word, phrase, or sentence is used deliberately to confuse, deceive, or mislead. In other words, saying one thing but meaning another.

When it's poetic or comical, we call this a "play on words." But when it's done in a political speech, an ethics debate, or an economics report — and it's designed to make the audience think you're saying something you're not — that's when it becomes a fallacy.

The arguer uses a potentially ambiguous term in more than one sense and consequently misleads the audience.

Here is the common structure of equivocation:

- *Term X is used to mean Y in the premise.*
- *Term X is used to mean Z in the conclusion.*

EXAMPLE

 I promised my mum I would never speak to my best friend again, and I didn't, I just texted them on my phone.

In this example we see that the arguer told his mum that he wouldn't 'speak' to his best friend but continued to text him. Obviously that means they are still speaking, but due to the use of ambiguous language and play on words, the arguer tries to convince the audience that they followed through on their promise to their mum. Equivocations don't show up TOO much in tests, because they're generally easier to spot than other fallacies, but students should still be very well versed in how to identify this flaw in an argument.

4.5 CAUSAL FALLACY

Causal fallacies are informal fallacies that occur when an argument incorrectly concludes that a cause is related to an effect. Think of the causal fallacy as a parent category for other fallacies about unproven causes. One example is the false cause fallacy, which is when you draw a conclusion about what the cause was without enough evidence to do so. Another is the post hoc fallacy, which is when you mistake something for the cause because it came first — not because it actually caused the effect.

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4.6 SLIPPERY SLOPE

A slippery slope argument assumes that a certain course of action will necessarily lead to a chain of future events. The slippery slope fallacy takes a benign premise or starting point and suggests that it will lead to unlikely or ridiculous outcomes with no supporting evidence.

This is a conclusion based on the premise that if A happens, then eventually through a series of small steps, through B, C,..., X, Y, Z will happen, too, basically equating A and Z. So, if we don't want Z to occur, A must not be allowed to occur either.

EXAMPLE

Doug told me "If you don't brush your teeth every day, they will rot, and then no one will want to speak to you, and as a result, you'll never be able to get a job and end up living on the street."

Which of the following best describes the flaw in the above argument?

A. The initial assertion is contradicted by the conclusion.

B. The argument does not give a convincing explanation for the benefits of brushing your teeth

C. The argument equates not brushing your teeth to living on the street and will set off a series of events, in spite of the fact that no logical proof was provided.

D. It draws from a sample that does not necessarily represent most opinions

This example is a perfect example of the slippery slope fallacy. Just as the correct answer (option C) states, the arguer is equating not brushing your teeth to living on the street. This of course is highly illogical and is a common fallacy that pops up in selective exams. A clue to look for in the question, is a series of events that chain together. If you see a similarly structured question like the example above, it's a good chance it is the slippery slope fallacy.

4.7 AD HOMINEM ATTACK

An ad hominem fallacy uses personal attacks rather than logic. This fallacy occurs when someone rejects or criticizes another point of view based on the personal characteristics, ethnic background, physical appearance, or other non-relevant traits of the person who holds it.

The ad hominem fallacy occurs when someone attempts to discredit another's argument by mentioning disreputable aspects of the person's character, instead of focusing on what is wrong with the argument itself. Establishing, for example, that someone is a bully is not a good reason to conclude that their reasoning must be at fault. However, some personal characteristics (for example, a tendency to exaggerate, or a temporary or permanent mental incapacity) may be relevant to judgements about the reliability of information which others give us. But it is fallacious to claim that a particular conclusion does not follow from acceptable evidence or true reasons, simply on the grounds that the person drawing the conclusion has an unpleasant personality.

You can most easily observe an *ad hominem* attack when:

- An arguer criticizes someone's **actions** as a reason to not heed their argument.
- An arguer criticizes someone's **character** as a reason to not heed their argument.
- An arguer criticizes someone's **motives** as a reason to not heed their argument.

In conclusion, ad hominem attacks another arguer instead of the argument itself. The identity or motives of an arguer don't affect the validity of that person's argument.

EXAMPLE

"MacDougal likes Britain. Clearly he's unfit to be a police minister in Australia."

This is a perfect example of an ad hominem attack, and is yet another fallacy that students should be able to spot immediately. The arguer criticises MacDougal's beliefs and affection for Britain as a reason for him to be unfit as a police minister. This is completely illogical, as his

appreciation for Britain has nothing to do with his abilities or qualifications to be a police minister. Look out for PERSONAL attacks on beliefs, ideologies, character or appearance in questions, as it is a good sign of the ad hominem fallacy.

4.8 STRAWMAN ARGUMENT

A straw man argument attacks a different subject rather than the topic being discussed — often a more extreme version of the counter argument. The purpose of this misdirection is to make one's position look stronger than it actually is.

The straw man argument is appropriately named after a harmless, lifeless scarecrow. Instead of contending with the actual argument, they attack the equivalent of a lifeless bundle of straw — an easily defeated puppet that the opponent was never arguing for in the first place.

A strawman attack is a fallacious argument that distorts an opposing stance in order to make it easier to attack. Essentially, the person using the strawman pretends to attack their opponent's stance, while in reality they are actually attacking a distorted version of that stance, which their opponent doesn't necessarily support.

In general, the use of a strawman consists of the following three stages:

- First, person A states their position.
- Then, person B presents a distorted version of person A's original position, while pretending that there's no difference between the two versions.
- Finally, person B attacks the distorted version of person A's position, and acts as if this invalidates person A's original argument.

In conclusion, ad hominem attacks another arguer instead of the argument itself. The identity or motives of an arguer don't affect the validity of that person's argument.

Essentially, person B creates a *strawman*, which is a distorted version of their opponent's original argument, which makes it easier for them to attack their opponent's stance.

This means that there is a flaw in the premise of the strawman argument, since the stance that it addresses does not accurately reflect the stance that it was originally meant to address. As such, the strawman fallacy is considered to be a type of an *in*formal logical *fallacy*, and

specifically a type of a *relevance fallacy*, since the person using it is attacking a stance that is not directly relevant to the discussion at hand.

EXAMPLE

Here is an example of a strawman argument in the form a conversation between Two friends, Jill and Jenny

Jill: I prefer my hair to be dyed brown over black. It looks better in my opinion.

Jenny: Why do you hate black hair?! Are you saying I look bad because my hair is black?

Jenny's response is the perfect example of the straw man argument fallacy. Just because Jill prefers her hair to be dyed brown rather than black, it does not mean she hates black hair. Jenny has DISTORTED Jill's stance on her preference of hair colour and attacked her view with a completely irrelevant point that Jill never made nor implied.

4.9 RED HERRING FALLACY

A red herring is an argument that uses confusion or distraction to shift attention away from a topic and toward a false conclusion. Red herrings usually contain an unimportant fact, idea, or event that has little relevance to the real issue.

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Red herrings are a common diversionary tactic when someone wants to shift the focus of an argument to something easier or safer to address. But red herrings can also be unintentional. The first step to responding to a fallacious red herring is to recognize that a red herring has been used. You can do this by asking yourself whether the information that's been presented is relevant to the topic at hand, or whether it's meant to distract you or others from what's being discussed, often as a way to avoid a question or shift the discussion in a new direction.

When a red herring fallacy is used, you may:

- Point out the red herring fallacy
- Assess its claims
- Lastly, explain why it's fallacious

EXAMPLE

Here is an example of the red herring fallacy in the form of a conversation between a Mum and her son.

Mum: How did you go in the recent maths test? I hear the results were released today. Did you do well?

Son: The test was really hard! Everyone was struggling and mentioned how difficult it was once we came out of the exam room. I studied really hard for that test!

The son's response to his mum's question is a perfect example of the red herring fallacy. We can see in this example the son's response tried to distract his mum with information that is somewhat relevant to the topic of the conversation, but not an answer to the question she asked. Instead of saying what mark he got in the test, the son went on a tangent to explain how difficult the test was, and that he studied hard for it. The red herring is frequently tested, and is an important fallacy to be able to identify quickly and efficiently. Look out for 'dialogue' questions that ask to identify flaws in a person's argument as these types of questions commonly contain red herring fallacies.

4.10 BANDWAGON FALLACY

Because everyone says so, it must be true. The bandwagon fallacy assumes something is true (or right or good) because others agree with it. In other words, the fallacy argues that if everyone thinks a certain way, then you should, too.

One problem with this kind of reasoning is that the broad acceptance of a claim or action doesn't mean that it's factually justified. People can be mistaken, confused, deceived, or even willfully irrational in their opinions, so using them to make an argument is flawed.

Bandwagon fallacy is a logical fallacy that is based on the assumption that something must be true or good if it's in accordance with the opinions of many others. It's an extremely common error and can be committed either unintentionally or on purpose. "It's true because I know a lot of people who think so too!" is the grounds of this fallacy.

Here is an example of bandwagon fallacy structure:

- X is popular.
- Popular things are always true (unstated).
- Therefore, X is true.

The bandwagon fallacy belongs to the category of *informal fallacies*, as well as its sub-category called *fallacies of relevance*.

- ***Informal fallacies*** refer to arguments containing irrelevant or invalid evidence that renders the conclusion incorrect. They stem from an error in reasoning rather than from an error in the logical structure of the argument.
- ***Fallacies of relevance*** occur when the evidence of an argument is not relevant to the conclusion, and thus doesn't provide adequate reasons to believe its truthfulness.

EXAMPLE

The IPhone is the most popular phone on the planet. The sales figures reflect this, and pretty much everyone I know has one. It must be the best phone that's available and is certainly the best choice for anyone looking for a new phone.

The argument above is a great example of the bandwagon fallacy. Just because IPhone sales figures are extremely high and it's the most popular phone on the planet, it doesn't mean it's the BEST phone. Each individual has different needs, and may be suited to a different product based on these needs. The argument doesn't take into account any factors except popularity of the product, and presents that as the sole evidence to why the IPhone is the best phone on the market. This is flawed reasoning, and a perfect example of the bandwagon fallacy.

QUIZ

If you were a real Australian, you would defend people's freedom to drive any car they chose.

Which of the following best describes the flaw in the above argument?

- *This is an attack on the character of Australians, not on their ideas or positions.*
- *The argument is highly reliant on using emotion to make its point.*
- *This is an argument that conveys what the majority of Australians believe in order to persuade others to believe the same way.*
- *This argument conveys that if people don't have freedom, Australia will perish.*

4.11 CIRCULAR ARGUMENTS

Circular arguments occur when a person's argument repeats what they already assumed before without arriving at a new conclusion. For example, if someone says, "According to my brain, my brain is reliable," that's a circular argument.

Circular arguments often use a claim as both a premise and a conclusion. This fallacy only appears to be an argument when in fact it's just restating one's assumptions.

Circular reasoning occurs when someone makes an argument in which both the premises and the conclusion have to rely on the truthfulness of the other.

As such, the logic of it goes:

- A is true because B is true;
- B is true because A is true.

Circular arguments can be quite easy to identify when they are short and it's clear what the person is trying to convey. However, if the argument involves multiple, more complicated concepts, it becomes increasingly difficult to recognize them.

EXAMPLE

An incredibly popular example of a circular argument comes from Joseph Heller's novel 'Catch-22'. Within the story, soldiers are told that 'to get out of combat, you have to be considered crazy. But anyone who wants to get out of combat isn't crazy.' So essentially, it's never possible for any soldier to get out of combat. It's important to recognise that the end of the argument almost always

4.12 | APPEAL TO AUTHORITY

An appeal to authority implies that the argument is reliant on individuals of a relatively high status rather than actual evidence.

In addition, an **appeal to authority** fallacy, also known as *argument from authority*, is a type of logical fallacy that refers to the different ways of fallaciously using the statements or opinions of authority figures in order to support a conclusion. For instance, someone may assume that something must be true if a so-called expert believes it to be true, and no other evidence is needed.

Relevant experts can provide us with strong reasons to believe that something is true due to their experience, training, knowledge, and access to more information. They are able to evaluate information better and put more compelling evidence and arguments together than a non-expert could. Consequently, when someone makes a claim that is in accordance with the views of the experts, it's also supported with all the evidence the experts are relying upon.

As such, there are certain requirements that should be met for an *argument from authority* to be legitimate:

- The authority is an acknowledged expert in the field under consideration.
- The statement of the authority is relevant to their field of expertise.
- There is a general agreement among experts in the field under consideration.

Here is a common structure used for this fallacy:

- Authorities on a certain issue are usually correct.
- Authorities on the issue have a general agreement that X is correct.
- X is likely correct.

EXAMPLE

Brad Pitt runs 10km per day. That means that in order to lead a happy and successful life like he does, you must run 10km per day.

This argument relies on an 'appeal to authority', in this case being a well known celebrity, who has incredibly high socioeconomic status and is generally considered to be happy and highly successful. It uses that status that Brad Pitt holds to make the argument that just because he runs 10km per day, it is the key to being happy and successful. This is not the case, as Brad Pitt is successful for many different reasons that are most likely completely unrelated to how much he runs every day. Although that may be a contributing factor, it is not the defining reason for his success and nor will it lead other people to the same success he has achieved.

4.13 — APPEAL TO IGNORANCE

An appeal to ignorance (also known as an "argument from ignorance") argues that a proposition must be true because it has not been proven false or there is no evidence against it.

As mentioned above, one falls victim to this fallacious line of reasoning when they assert that a claim must be true if it hasn't been proven false, or false if it hasn't been proven true. Ignorance, or the lack of opposing evidence, is the main premise for the argument, hence the name "appeal to ignorance".

There are two logical forms for this argument, depending on if the argument is affirmative or negative. The affirmative claim asserts that a particular conclusion must be true since there is no evidence against it, and a negative one declares a conclusion false due to the same reason.

Affirmative form:

- There is no evidence against X.
- Therefore, X is true.

Negative form:

- There is no evidence to support Y.
- Therefore, Y is false.

The reality is that appealing to ignorance doesn't provide any real evidence — it only points out that we do not know something. If this type of argument was valid it could be used to support two opposing arguments, which is a clue that it is based on flawed reasoning. For example, "you cannot prove that ghosts don't exist, therefore they must exist" or "you cannot prove that ghosts exist, therefore they don't exist".

Furthermore, this fallacy frequently appears together with the burden of proof: the person

appealing to ignorance erroneously assumes that their opponent has the obligation to justify the opposing claim.

The argument can be used to bolster multiple contradictory conclusions at once, such as the following two claims:

EXAMPLE

"No one has ever been able to prove that extraterrestrials exist, so they must not be real."

"No one has ever been able to prove that extraterrestrials do not exist, so they must be real."

Both of these statements are an example of the 'appeal to ignorance' fallacy. Just because nobody has proven something exists, it doesn't mean that they certainly do NOT exist. Similarly, just because someone hasn't proved something doesn't exist, it does not mean that they certainly DO exist.

4.14 FALSE DILEMMA

A false dilemma or false dichotomy presents limited options — typically by focusing on two extremes — when in fact more possibilities exist. Do not be limited by the information in the text

The false dilemma fallacy is a manipulative tool designed to polarize the audience, promoting one side and demonizing another. It's common in political discourse as a way of strong-arming the public into supporting controversial legislation or policies.

Accordingly, it's also known as the **either-or fallacy**, *all-or-nothing fallacy*, and *black-and-white thinking*. Furthermore, it's frequently characterized by "either-this-or-that" type of language, implying that if one of the choices is true, the other one must be false, or if you don't accept one, the other must be accepted. In reality, however, both of the options may be false or could be accepted at the same time.

EXAMPLE

 "America: Love it or leave it".

This argument is presenting two options, to either love America or leave the country. This is very misleading as there are many OTHER options that don't involve either of those scenarios. You could simply be content with living in America, and be willing to put up with the downfalls of the country. Living in a country doesn't mean you have to LOVE it, and not want any changes to happen for example in policies, laws etc.

QUIZ

We can either start using sustainable energy sources or destroy the earth.

Which of the following best describes the flaw in the above argument?

A. *It assumes that a sequence of events will inevitably occur.*

B. *This is an oversimplified conclusion that reduces the debate to simply two sides or options.*

C. *It draws from a sample that does not necessarily represent most opinions.*

D. *The initial assertion is contradicted by the conclusion.*

4.15 SYLLOGISTIC FLAW

A syllogistic logical flaw is one that breaks the logic by confusing sufficiency with necessity.

When logical fallacies occur in the syllogisms of deductive reasoning. This occurs with a reference to something general, and then makes a conclusion about something more specific. A syllogism is an argument that has a major premise, a minor premise and a conclusion, and often appears in the form 'A is B, C is D, therefore E is F'. This is a specific form of argument with very specific rules that are easy to break. In many ways, syllogistic fallacies are the 'classic' form of fallacy.

X is Y does not necessitate that Y is X.

How to create a contrapositive:

1. Invert the order (switch the left with the right, switch the right with the left)
2. Negate (positive becomes negative, negative becomes positive)

Formula: A+ -> B+

      (flip and negate)

      -B -> -A

Sufficiency or Necessity?

- Sufficiency (if, when, where etc. - does not exclude)

Example: Steven will get fit if he goes to the gym - Contrapositive -> If Steven does not go to the gym, he will not have gotten fit. (It is possible for Steven to get fit without going to the gym)

- Necessity (only, only if, must etc. - excludes other possibilities)

EXAMPLE

 Steven will get fit only if he goes to the gym - Contrapositive -> Only if Steven does not go to the gym, he will not have gotten fit. (It is not possible for Steven to get fit without going to the gym)

QUIZ

1. "If you are a tall person, you are good at basketball"

If this is true, which of the following statements must also be true?

A. If you are not tall, you can be good at basketball

B. If you are tall, you can be good or bad at basketball

C. If you are not good at basketball, you are not tall

D. If you are not good at basketball, you can be tall

2. "If you go camping, you are a lover of the outdoors."

If this is true, which of the following statements must also be true?

A. If you are not a lover of the outdoors, you don't go camping.

B. If you are a lover of the outdoors, you might go camping.

C. If you are not a lover of the outdoors, you sometimes go camping.

D. If you are not a lover of the outdoors, you go camping.

3. "All good Cellos are made from Rosewood"

If this is true, which of the following statements must also be true?

A. If a Cello is not made from Rosewood, it is good.

B. If a Cello is not made from Rosewood, it isn't good.

C. If a Cello is made from Rosewood, it might be good.

D. If a Cello is made from Rosewood, it isn't good.