

Created by

# Science is Dope

<https://www.youtube.com/@scienceisdope>

<https://www.youtube.com/@ddrational>

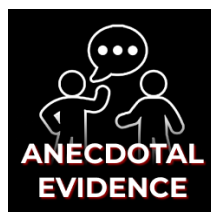
Remember - you don't need to know the names of these fallacies. Just remember that someone makes a claim(empirical claim), it has to be backed by a logical reason based in evidence. It can either be directly observed evidence or indirectly inferred from evidence.

Sometimes certain complex forms of evidence can only be obtained through study and research. This is usually the case with results in medicine and diet etc. Such studies are often faked with poor quality studies. Usually a study has to be well designed accounting for fallacies and biases. Passing peer review and being published in a reputed journal are indicators of good quality studies.

## **List of Common Biases and Fallacies:**



**Confirmation Bias** - When someone has a certain belief in an idea, whenever they see anything remotely close to that idea, they might see that as a confirmation of their belief and fail to examine it closely  
Eg:- Someone who believes we had advanced technology in ancient India, might see a text like vimaanika shastra (which has been debunked and exposed in the 1970's) as evidence that ancient Indians had flying technology.



**Anecdotal Evidence** - Citing personal experience as an evidence for a certain idea. (We need statistical evidence like from a Randomized controlled trial for things like medicine and diet.)  
Eg:- Someone might say ayurveda cured their childhood asthma. Hence ayurveda is effective.

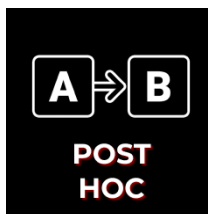


**Research not provided** - If the argument/point made is making a claim that requires research but is not provided along with the claim  
Eg:- Most medical/diet claims require research



**Appeal to tradition** - When someone gives a cultural/traditional reason to back up their point/argument.

Eg:- These medicines have been used by my ancestors for thousands of years. Hence they work.



**Post Hoc Ergo Propter Hoc(After this therefore because of this)** - When two events A and B, occur B after A, assuming that B occurred because of A, commits this fallacy.

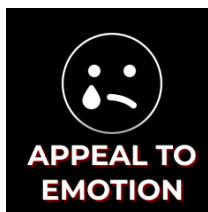
Eg:- She took the medicine and recovered. Hence she recovered because of the medicine.

Eg:- Going out in the cold makes you sick or Getting your head wet makes you sick (getting exposed to the common cold virus makes you sick)



**Bad Research** - Usually a diet or medicine claim (or things like water memory) where the research may not be peer reviewed, may be published in a terrible journal(either predatory journals with a low impact factor) or may not even be published research.

Eg:- The water memory claim by Masaru Emoto is like this



**Appeal to emotion** - When people cry to show how hurt they are by an argument. Or when people say “look at how many people feel better when they pray at a temple. Are you against all that?”



**Rationalisation** - When someone makes a decision and then finds a reason why they made that decision (but subconsciously believes that the reason was what led to their decision).

Eg:- Someone might go for Ayurveda and then talk about how effective it is. Someone might be born into a religion and then then decide it is very 'scientific'



**Black and White fallacy/ False Dichotomy** - Also known as false dichotomy - it's when someone takes two choices and pretends they're the only ones that exist.

Eg:- Either matter is a wave or a particle

Either sugar is good for you or it is harmful

Either maida is healthy or you should completely avoid it



**Middle Ground Fallacy** - When someone points out that these two options in front of you are two extremes, the truth lies in the middle. (Instead of showing evidence for where the truth lies)

Eg:- To be a hyper-religious person is one extreme and to be a hyper-scientific atheist is the other extreme. You should choose the middle path (This is a fallacy)



**Fear Mongering** - When someone creates unnecessary fear about an item, usually food or medicine, saying it's harmful without providing convincing evidence.

Eg:- Sugar is a poison



**False Analogy** - When someone compares two things and says since one is like this, the other is also the same way.

Eg:- You don't see electrons but you know they're real. The same way, even though you can't see God, he's also real. (The real reason is that even though we can't see electrons, we have evidence for their existence. We don't have the same for God)



**Oversimplification** - Often seen in food fear mongering videos. Sugar causes an insulin response in the body that may lead to insulin sensitivity if you overconsume it. And insulin sensitivity can lead to obesity. And obesity is a risk factor for heart disease. Instead of all this saying that "avoid all sugar because it causes heart disease" is an oversimplification. It ignores all nuance.



**Extraordinary Claims require Extraordinary Evidence** - Self explanatory. It's a Carl Sagan quote.



**Just Universe Fallacy** - It's the assumption that all the good deeds and bad deeds in the Universe will balance out over time.

Eg:- The gurus may sell some deceptive courses and products in their followers - but look at all the good they do. Schools, hospitals, free meals for people) (the assumption here is that the good deeds balance out the bad. Bad deeds are just bad on their own and no amount of good deeds can balance it out) Eg:- Karma



**Using Science to justify beliefs** - Self explanatory. I've made a main channel video on terms that are often used to give an impression that an idea is scientific (when it's actually not).



**Strawman** - Misrepresenting an argument so that it's easier to argue against

Eg:-

Me: I don't believe that God exists.

Him: How can you say that God doesn't exist? (He is misrepresenting my argument because I never said that)



**Tu Quoque fallacy** - Literally means "who are you to say that?". A type of response to an argument where they say "what about what you're doing?" or "what about what they are doing".

Eg:-

A: Don't smoke. It's harmful.

B: But you smoke all the time. (B has just committed a Tu Quoque fallacy. Because whether A smokes or not does not decide the truth of the statement "smoking is harmful")



**Whataboutery/whataboutism** - It's a variant of the tu quoque fallacy where the opponent tries to deflect an argument by pointing out "What about them? They're also doing the same thing". Often see



**Misinformation** - Self Explanatory.



**Begging The Question** - A type of reasoning where the conclusion to the question/premise(s) is already part of the question itself.

Eg:- This creation definitely has to have a creator



**Appeal to Popularity/Bandwagon Fallacy** - Many people believe this so it must be true.

Eg:- Most people believe that God exists. So it must be true.



**Special Pleading** - Making an exception to a rule on unfair grounds.

Eg:- Everything in the universe is caused by something else that came before it. And that first cause is God (So what caused God to exist?)



**Appeal to ignorance** - When you argue that there must be some reason why this is true, I don't know the reason but there must be some reason.

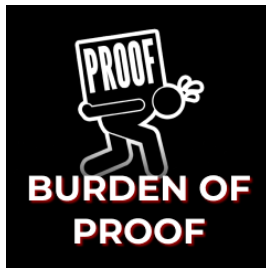
Eg:- I think there must be a higher power in the Universe. I don't know what it is like but there must be something.



**Ad Hominem** - Literally means “against the person”. Arguing that someone has XYZ quality. So, They must be wrong.

Eg:- You’re wrong because you’re stupid.

Eg:- You’re lying because you’re a communist/atheist/anti-national



**Burden of Proof Fallacy** - This is when someone claims something to be true until it can be proven false.

Eg:- Karma exists. If it doesn’t, then you prove it.



**Appeal to authority** - Arguing that this well reputed person said so. Hence this must be true.

Eg:- Hinduism is very scientific because Carl Sagan said so.



**Cherry Picking** - Taking only some facts to make a point, while not the others. Basically, picking and choosing what you want to support your argument, when you should make an argument based on all the known fallacies.

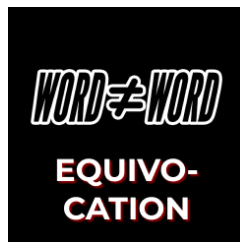
Eg:- Look at your eye. It’s so well made. There is a lens, there is colour perception, there is a socket in your skull for protection of the eye. There has to be a designer who made this.

(They ignore the fact that some people are born blind from birth, there are diseases of the eye which can make a person blind like cataracts or diabetic retinopathy - A perfect designer would never do this)



**Hasty Generalization** - Taking something true for a very small sample of things to saying that that something is true for this large sample.

Eg:- Water has memory, therefore fire must have memory, earth must have memory etc.



**Equivocation** - When the same word has two different meanings and the wrong meaning of the word is used to justify the point.

Eg:- Evolution is just a theory. (Here, the word theory is confused with its colloquial meaning where it's the same as a hypothesis. Whereas the word 'theory' in 'theory of evolution' means a scientific theory)



**Untestable Claim** - An empirical claim has to be testable. If someone talks about a thing that is not detectable or measurable, then he's making an untestable claim.

Eg:- I have an invisible, intangible dragon that breathes heatless fire. I wish I could show it to you.



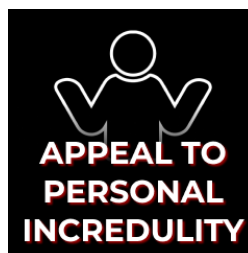
**Hindsight Bias** - When you look back at the past and think about how you should have acted, after knowing how the future turned out.

Eg:- After the cricket match, "I knew India was gonna beat Pakistan today. Should have bet on them."



**Slippery Slope** - When someone takes the truth of one or two facts and extrapolates it to conclude an extreme fact will be true.

Eg:- Yesterday sex before marriage is considered ok. Today homosexuality is considered ok. Tomorrow sex with animals will be considered ok.



**Appeal to Personal Incredulity** - Saying that this has to be true because I can't think of any other possibility.

Eg:- If it's not some supreme being that created the Universe, I can't think of any other explanation



**Negativity Bias** - When people have a tendency to weigh negative outcomes more than positive ones. Or when people have more aversion to harm than they have affinity toward a reward.



**Gish Gallop** - When someone overwhelms the opponent in an argument by making many points(probably faulty) and making it difficult for them to address each one.



**God of the Gaps** - Science has advanced so much that the same phenomena that were initially attributed to God are now clearly understood. People now use God to explain the few gaps their knowledge that science doesn't understand yet.

Eg:- The fact that consciousness exists, the fact that this Universe was created out of a single point or the fact that



**False Equivalence** - Saying two things are similar when they are clearly not.

Eg:- On sunny days black clothes absorb the most heat. The same way black clothes absorb the most negative energy