Logical fallacies

Below is a list and brief description of logical fallacies commonly found in persuasive or argumentative writing and speaking. Such fallacies were first described by ancient Greek and Roman writers (especially orators and rhetoric teachers), so some of them have Latin names. Such rhetorical techniques have been used throughout history by orators, scholars, and common people alike. Today they are often used in advertising, politics, and occasionally even in professional and academic persuasive speaking or writing. Some examples may fall under more than one of the categories below. Learn to watch out for use of these fallacies. Unfortunately, these are used by all kinds of people, no matter what is their educational level, social status, political affiliation, etc. Use this knowledge for what Carl Sagan calls “baloney detection” – detecting false, nonsensical, or deceptive claims.

Errors of causality (including emotionalistic arguments)

False cause
(post hoc fallacy; post hoc, ergo propter hoc; reductive fallacy; oversimplification, correlation fallacy)

Simplistic cause-and-effect relationships are given for complex problems or issues; two events are given as cause-and-effect, when the relationship may be much more complicated or non-existent.

- Poverty causes crime. (It’s a factor, but not the cause.)
- The welfare system is causing a breakdown in American families.

In the 50’s, for example, after some nuclear bomb tests, the US was hit by a severe winter; some claimed that the bomb tests were responsible, even though meteorologists showed that the weather was caused by a predictable shift in the Gulf Stream.

Politicians rely heavily on false cause, e.g., by priding themselves on economic achievements that happened while they were in office, or by blaming incumbents for economic problems that happened during their time in office.

One might claim (facetiously) that eating ice cream causes drowning! In the summer, there are more cases of drownings, and people eat more ice cream. Of course, the real cause is the summer heat, for which people eat ice cream, and for which people go swimming more, hence the increase in drownings. Hence, no correlation exists between ice cream and drowning; ice cream does not cause drowning. The causal relationship is much more complex.

Ad hominem
(argumentum ad hominem, argument to the person/man)

Such an argument focuses on an individual’s personal life or character and ignores real issues; it is common in political campaigning and advertising.
We shouldn’t adopt the proposed health care plan, because its advocates are simply a bunch of socialists.

**Ad populum**
(argumentum ad populum, argument to the people)

This is an emotionalistic appeal to common values or deep biases of the masses; it is similar to ad hominem, and likewise is common in politics and advertising.

*This fine, patriotic, church-going American deserves your vote.*

Variations of this common in advertising and politics are:

a) **snob appeal:** Advertisements that appeal to desire for status and wealth, e.g., by associating the product with use by high-status or wealthy people.

b) **bandwagon:** “Are you the only one on your block who doesn’t have a box of Super Choco-Bombs cereal?”

c) **flattery:** “You are obviously a very intelligent person, so can I get you to take a look at our encyclopedia?”

d) **guilty by association:** “This man is a communist, because he associates with other known communists.”

**Appeal to ignorance (ad ignorantium)**

A writer asserts that a claim must be true simply because no one can disprove it; in doing so, the writer evades his/her responsibility and unfairly shifts the burden of proof onto the reader/listener.

*Although doctors say that wearing copper bracelets to improve arthritis problems has no medical basis, they haven’t shown that they don’t help or cause harm, therefore you should buy them.*

**Genetic fallacy**

The writer assumes that the nature of character of a person, object or idea can be judged based on its origins.

*She’s from Arkansas, so she must be stupid.*

*He couldn’t have done such a thing — he’s from a good family.*

*Acupuncture can’t be considered an acceptable medical technique, since it came from ancient China.*

**Red herring**

According to an old belief, dragging a red smoked herring (a particularly strong-smelling fish) across a trail would divert a pack of hunting dogs from the scent into another direction. So a red herring is a diversionary tactic that sidetracks an argument and diverts the reader’s attention with an irrelevant point.

*For example, if two candidates in a debate are discussing each other’s qualifications for holding office, one might introduce a red herring by bringing up questions about the other’s alleged socialist or “radical” connections, or travels to a communist country — totally unrelated to the discussion of qualifications.*
Argument from false authority
We should accept a claim simply because some respected person tells us to do so.

   Michael Jordan uses this product, so you should too.
   You should believe this, because this famous doctor says it’s true.

Argument from adverse consequences
One is asked not to accept a position because doing so would require them to accept unpleasant consequences that stem from it.

   If you don’t believe in Santa Claus, who’s going to bring you your Christmas presents? (a threat from a parent to a skeptical child)

Tu quoque (“you also”)
The writer evades an issue or deflects a charge or question by accusing the opponent of the same or something similar.

   Who are you to criticize me for cheating on my taxes when you pad your expense account so lavishly?

Naturalistic fallacy and moralistic fallacy (appeals to nature)
A claim is made based on the assumption that what is natural (e.g., what occurs in nature or arose via evolution) is inherently good, right or moral, and whatever is not “natural” is wrong or immoral. It may be the case that what is natural is purely neutral morally, or has nothing to do with human morality or truth claims.

   These vitamins are synthetic, not natural, and thus, are inferior. (Vitamins are simply chemicals, so scientists would say that the source does not matter.)
   Warfare should be tolerated because it is part of the violent and natural instinct of human nature.

The naturalistic fallacy (claims about what is good) overlaps with the moralistic fallacy (regarding what is moral), that what is morally desirable is to be found in nature.

   If other animal species engage in adultery or don’t stay with their partners, then why can’t we choose the same lifestyle?

These fallacies also overlap with the “is-ought” problem or fallacy – deducing an “ought” from an “is,” i.e., assuming that things should be as they are in nature or in the world. Such fallacies were invoked in the days of social Darwinism – misusing natural selection as a basis for human society.

Lexical / semantic fallacies

Euphemism
Using euphemisms to “soften” or hide the truth, e.g., when the Pentagon speaks of “collateral losses or damage” instead of “civilians killed”.

Misuse of jargon
Impressive jargon or academic vocabulary is used merely to make a weak argument sound impressive.
Equivocation
Using different definitions of the same words. Those who doubt evolution criticize it as “just a theory,” but ‘theory’ in science does not mean ‘hypothesis’ - it means an explanatory conceptual framework, a set of ideas, which could be proven true and still be called a theory. Another famous example was when Bill Clinton was asked if he had been alone with Ms. Lewinsky; he answered was that it depends on what one means by “being alone.” Here is an example of changing word meanings within an argument.

Socrates is a man. All men are pigs. Thus, Socrates is a pig.

Hyperbole
Exaggerated words, emotionalistic wording, or extreme examples are selected to make a point.

Weasel words
Biased wording used to present doubtful, controversial or arguable ideas as if they were facts, with wording like “some / many scientists agree that...” (but who? - which scientists? - no specific credible scientists are cited).

Logical and syllogistic errors

False syllogism
A conclusion based on faulty assumptions

\[ \text{Socrates is a man.} \]
\[ \text{All men are pigs.} \]
\[ \therefore \text{Socrates is a pig.} \]

begging the question (loaded assertion, circular reasoning/argument)
A writer “begs the question” by assuming a premise to the argument to be already proved or disproved without providing evidence for this assumption — a sort of circular reasoning.

Since evolution is simply a theory, and has never been observably proven, public schools should teach any other theory of origins alongside evolution.

Are you going to listen to this liar, or impeach him like you should?!

(His reputation as a liar here is asserted, not proven.)

either/or fallacy (black/white fallacy, false dilemma fallacy, fallacy of insufficient options)
Writers and speakers often try to force their audience to choose between two conflicting alternatives by suggesting that no other options or middle ground exist — an unfair oversimplification of options.

America — love it or leave it!
Those who reject socialism are merely neo-fascists.
If you don’t like our capitalist system, you’re some kind of communist!”

loaded question (complex question)
A question is worded unfairly so that any kind of answer will support the writer’s assumptions.

Have you stopped beating your wife?
How long have you been consorting with known Mafia types?
How often have you been cheating on your taxes?

**non-sequitur (“it doesn’t follow”)**

One point or argument does not follow logically from the preceding one, i.e., no logical relationship exists between two or more supposedly connected ideas.

- He has my vote for senator, because he has the best run campaign.
  (What does a campaign organization have to do with qualifications?)

**comment on the obvious**

A statement which is obvious, but is very general or uninformative, and does not actually prove any point.

- If we don’t do anything about the drug problem, millions of Americans will continue to suffer from drug addiction, drug-related crime, and other social hazards.
  (While this is unarguably true, this obvious statement does not support the writer’s arguments in favor of his/her proposed policies or solutions.)

**tautology**

An empty statement composed of simpler statements so that makes it is logically true whether the simpler statements are true or false (x=x, not x=y); e.g., “Either it will rain tomorrow or it will not rain tomorrow”.

- If we don’t succeed, we will fail.

**Errors of evidence**

**hasty generalization**

This is a conclusion based on too little evidence or unrepresentative evidence.

- If the team is losing, the coach should be fired.
  He always screws up important projects. (“always” may not be true — just sometimes)

**insufficient statistical evidence**

The statistics cited do not support the conclusion; or the sample size of the study is too small to make meaningful conclusions; or samples or statistics are arbitrarily selected; or one study is cited when more studies are needed to confirm the results.

**observational selection**

Noticing only the observations that tend to form the patterns that one wants to see and ignoring those that either don't fit or form undesirable patterns.
Complex fallacies

false analogy

The writer draws a comparison between two essentially unlike things, based on too few similarities. Just because they are alike in a few respects, they must supposedly be similar in other respects as well. Analogies can only illustrate a point, not prove it.

Non-human primates care for their young and protect their weak members. Why then must contemporary humans go excessively beyond this, with their Social Security, child care, welfare, national health care, etc., to protect every conceivable class of weak or infirm?
(To be consistent, one must ask why we speak to each other when apes do not.)

special pleading

This is an extended fallacy in which one presents an unfairly one-sided view of an issue. Although the particular points may be valid, the whole argumentation is biased and fails to consider opposing valid points.

For example, some famous and intelligent writers like Mark Twain and Jean Paul Sartre have argued against religion by focusing solely on all the negative aspects (religious extremism, the Crusades, wrongs committed by organized religion, religious fundamentalism, the prevalence of suffering and evil in the world, etc), without conceding any good points to religion (humanitarian benefits, ethical and moral teachings, positive social and personal benefits, etc.).

strawman argument

One argues against a theory or idea not by objectively criticizing the idea, but by attacking a misrepresentation of it. An incorrect and distorted representation of the idea is set up, like a fake strawman, and attacked. Or if a theory exists in several different versions or interpretations among its adherents, a critic attacks one particular version of the theory and then claims to have discredited the entire theory.

For example, controversy has raged in psychology and linguistics over whether human language ability is an innate or environmentally acquired. Opponents of innateness have sometimes attacked only one version of innateness theory without considering other versions, or have misrepresented the theory to attack it.

slippery slope

One creates an irrational fear that by accepting a valid argument you will be drawn in turn toward similar, but less valid ones, until you are persuaded to accept completely unacceptable arguments. In other words, if you accept one argument, this automatically leads to accepting more serious claims.

If you accept a nationalized health care system, you’ll be on the road toward socialism, and then communism.