Formal fallacies

Formal fallacies are arguments that are fallacious due to an error in their form or technical structure. All formal fallacies are specific types of non sequiturs.

- **Ad hominem**: an argument that attacks the person who holds a view or advances an argument, rather than commenting on the view or responding to the argument.
- **Appeal to probability**: assumes that because something *could* happen, it is inevitable that it *will* happen. This is the premise on which Murphy's Law is based.
- **Argument from fallacy**: if an argument for some conclusion is fallacious, then the conclusion must be false.
- **Bare assertion fallacy**: premise in an argument is assumed to be true purely because it says that it is true.
- **Base rate fallacy**: using weak evidence to make a probability judgment without taking into account known empirical statistics about the probability.
- **Conjunction fallacy**: assumption that an outcome simultaneously satisfying multiple conditions is more probable than an outcome satisfying a single one of them.
- **Correlative based fallacies**
  - **Denying the correlative**: where attempts are made at introducing alternatives where there are none.
  - **Suppressed correlative**: where a correlative is redefined so that one alternative is made impossible.
- **Fallacy of necessity**: a degree of unwarranted necessity is placed in the conclusion based on the necessity of one or more of its premises.
- **False dilemma** (false dichotomy): where two alternative statements are held to be the only possible options, when in reality there are more.
- **If-by-whiskey**: An answer that takes side of the questioner's suggestive question.
- **Ignoratio elenchi** (irrelevant conclusion or irrelevant thesis)
- **Homunculus fallacy**: where a "middle-man" is used for explanation, this usually leads to regressive middle-man. Explanations without actually explaining the real nature of a function or a process.
- **Masked man fallacy**: the substitution of identical designators in a true statement can lead to a false one.
- **Naturalistic fallacy**: a fallacy that claims that if something is natural, then it is "good" or "right".
- **Nirvana fallacy**: when solutions to problems are said not to be right because they are not perfect.
- **Negative Proof fallacy**: that, because a premise cannot be proven false, the premise must be true; or that, because a premise cannot be proven true, the premise must be false.
- **Package-deal fallacy**: consists of assuming that things often grouped together by tradition or culture must always be grouped that way.
• **Red Herring**: also called a "fallacy of relevance." This occurs when the speaker is trying to distract the audience by arguing some new topic, or just generally going off topic with an argument.

### Propositional fallacies

**Propositional fallacies**:

- **Affirming a disjunct**: concluded that one logical disjunction must be false because the other disjunct is true; *A or B; A; therefore not B*.
- **Affirming the consequent**: the antecedent in an indicative conditional is claimed to be true because the consequent is true; *if A, then B; B, therefore A*.
- **Denying the antecedent**: the consequent in an indicative conditional is claimed to be false because the antecedent is false; *if A, then B; not A, therefore not B*.

### Quantificational fallacies

**Quantificational fallacies**:

- **Existential fallacy**: an argument has two universal premises and a particular conclusion, but the premises do not establish the truth of the conclusion.
- **Proof by example**: where things are proven by giving an example.

**Formal syllogistic fallacies**

**Syllogistic fallacies** are logical fallacies that occur in syllogisms.

- **Affirmative conclusion from a negative premise**: when a categorical syllogism has a positive conclusion, but at least one negative premise.
- **Fallacy of exclusive premises**: a categorical syllogism that is invalid because both of its premises are negative.
- **Fallacy of four terms**: a categorical syllogism has four terms.
- **Illicit major**: a categorical syllogism that is invalid because its major term is *undistributed* in the major premise but distributed in the conclusion.
- **Fallacy of the undistributed middle**: the middle term in a categorical syllogism is not distributed.

### Informal fallacies

**Informal fallacies** are arguments that are fallacious for reasons other than structural ("formal") flaws.

- **Argument from repetition** *(argumentum ad nauseam)*: signifies that it has been discussed extensively (possibly by different people) until nobody cares to discuss it anymore.
• **Appeal to ridicule**: a specific type of appeal to emotion where an argument is made by presenting the opponent's argument in a way that makes it appear ridiculous.

• **Argument from ignorance** ("appeal to ignorance"): The fallacy of assuming that something is true/false because it has not been proven false/true. For example: "The student has failed to prove that he didn't cheat on the test, therefore he must have cheated on the test."

• **Begging the question** ("petitio principii"): where the conclusion of an argument is implicitly or explicitly assumed in one of the premises.

• **Burden of proof**: refers to the extent to which, or the level of rigour with which, it is necessary to establish, demonstrate or prove something for it to be accepted as true or reasonable to believe.

• **Circular cause and consequence**: where the consequence of the phenomenon is claimed to be its root cause.

• **Continuum fallacy** (fallacy of the beard): appears to demonstrate that two states or conditions cannot be considered distinct (or do not exist at all) because between them there exists a continuum of states. According to the fallacy, differences in quality cannot result from differences in quantity.

• **Correlation does not imply causation** (cum hoc ergo propter hoc): a phrase used in the sciences and the statistics to emphasize that correlation between two variables does not imply that one causes the other.

• **Equivocation** (No true Scotsman): the misleading use of a term with more than one meaning (by glossing over which meaning is intended at a particular time).

• **Fallacies of distribution**
  o **Division**: where one reasons logically that something true of a thing must also be true of all or some of its parts.
  o **Ecological fallacy**: inferences about the nature of specific individuals are based solely upon aggregate statistics collected for the group to which those individuals belong.

• **Fallacy of many questions** (complex question, fallacy of presupposition, loaded question, plurium interrogationum): someone asks a question that presupposes something that has not been proven or accepted by all the people involved. This fallacy is often used rhetorically, so that the question limits direct replies to those that serve the questioner's agenda.

• **Fallacy of the single cause** ("joint effect", or "causal oversimplification"): occurs when it is assumed that there is one, simple cause of an outcome when in reality it may have been caused by a number of only jointly sufficient causes.

• **False attribution**: occurs when an advocate appeals to an irrelevant, unqualified, unidentified, biased or fabricated source in support of an argument.
  o **Contextomy** (Fallacy of quoting out of context): refers to the selective excerpting of words from their original linguistic context in a way that distorts the source’s intended meaning.

• **False compromise/middle ground**: asserts that a compromise between two positions is correct.

• **Gambler's fallacy**: the incorrect belief that the likelihood of a random event can be affected by or predicted from other, independent events.
Historian's fallacy: occurs when one assumes that decision makers of the past viewed events from the same perspective and having the same information as those subsequently analyzing the decision. It is not to be confused with presentism, a mode of historical analysis in which present-day ideas (such as moral standards) are projected into the past.

Incomplete comparison: where not enough information is provided to make a complete comparison

Inconsistent comparison: where different methods of comparison are used, leaving one with a false impression of the whole comparison

Intentional fallacy: addresses the assumption that the meaning intended by the author of a literary work is of primary importance

Loki's Wager: the unreasonable insistence that a concept cannot be defined, and therefore cannot be discussed.

Moving the goalpost (raising the bar): argument in which evidence presented in response to a specific claim is dismissed and some other (often greater) evidence is demanded

Perfect solution fallacy: where an argument assumes that a perfect solution exists and/or that a solution should be rejected because some part of the problem would still exist after it was implemented

Post hoc ergo propter hoc: also known as false cause, coincidental correlation or correlation not causation.

Proof by verbosity (argumentum verbosium)

Prosecutor's fallacy: a low probability of false matches does not mean a low probability of some false match being found

Psychologist's fallacy: occurs when an observer presupposes the objectivity of his own perspective when analyzing a behavioral event

Regression fallacy: ascribes cause where none exists. The flaw is failing to account for natural fluctuations. It is frequently a special kind of the post hoc fallacy.

Reification (hypostatization): a fallacy of ambiguity, when an abstraction (abstract belief or hypothetical construct) is treated as if it were a concrete, real event or physical entity. In other words, it is the error of treating as a "real thing" something which is not a real thing, but merely an idea.

Retrospective determinism (it happened so it was bound to)

Special pleading: where a proponent of a position attempts to cite something as an exemption to a generally accepted rule or principle without justifying the exemption

Suppressed correlative: an argument which tries to redefine a correlative (two mutually exclusive options) so that one alternative encompasses the other, thus making one alternative impossible

Wrong direction: where cause and effect are reversed. The cause is said to be the effect and vice versa.

Faulty generalizations

Faulty generalizations:
• **Accident (fallacy):** when an exception to the generalization is ignored
• **Cherry picking:** act of pointing at individual cases or data that seem to confirm a particular position, while ignoring a significant portion of related cases or data that may contradict that position
• **Composition:** where one infers that something is true of the whole from the fact that it is true of some (or even every) part of the whole
• **Dicto simpliciter**
  - **Converse accident** (*a dicto secundum quid ad dictum simpliciter*): when an exception to a generalization is wrongly called for
• **False analogy:** false analogy consists of an error in the substance of an argument (the content of the analogy itself), not an error in the logical structure of the argument
• **Hasty generalization** (*fallacy of insufficient statistics, fallacy of insufficient sample, fallacy of the lonely fact, leaping to a conclusion, hasty induction, secundum quid*)
• **Loki's Wager:** insistence that because a concept cannot be clearly defined, it cannot be discussed
• **Misleading vividness:** involves describing an occurrence in vivid detail, even if it is an exceptional occurrence, to convince someone that it is a problem
• **Overwhelming exception** (hasty generalization): It is a generalization which is accurate, but comes with one or more qualifications which eliminate so many cases that what remains is much less impressive than the initial statement might have led one to assume
• **Pathetic fallacy:** when an inanimate object is declared to have characteristics of animate objects
• **Spotlight fallacy:** when a person uncritically assumes that all members or cases of a certain class or type are like those that receive the most attention or coverage in the media
• **Thought-terminating cliché:** a commonly used phrase, sometimes passing as folk wisdom, used to quell cognitive dissonance.

### Red herring fallacies

A red herring is an argument, given in response to another argument, which does not address the original issue. See also irrelevant conclusion

• **Ad hominem:** attacking the personal instead of the argument. A form of this is *reductio ad Hitlerum.*
• **Argumentum ad baculum** (*"appeal to force", "appeal to the stick"*): where an argument is made through coercion or threats of force towards an opposing party
• **Argumentum ad populum** (*"appeal to belief", "appeal to the majority", "appeal to the people"): where a proposition is claimed to be true solely because many people believe it to be true
• **Association fallacy** (guilt by association)
• **Appeal to authority:** where an assertion is deemed true because of the position or authority of the person asserting it
• **Appeal to consequences**: a specific type of appeal to emotion where an argument that concludes a premise is either true or false based on whether the premise leads to desirable or undesirable consequences for a particular party

• **Appeal to emotion**: where an argument is made due to the manipulation of emotions, rather than the use of valid reasoning
  - Appeal to fear: a specific type of appeal to emotion where an argument is made by increasing fear and prejudice towards the opposing side
  - Wishful thinking: a specific type of appeal to emotion where a decision is made according to what might be pleasing to imagine, rather than according to evidence or reason
  - Appeal to spite: a specific type of appeal to emotion where an argument is made through exploiting people's bitterness or spite towards an opposing party
  - Appeal to flattery: a specific type of appeal to emotion where an argument is made due to the use of flattery to gather support

• **Appeal to motive**: where a premise is dismissed, by calling into question the motives of its proposer

• **Appeal to novelty**: where a proposal is claimed to be superior or better solely because it is new or modern

• **Appeal to poverty** (*argumentum ad lazarum*): thinking a conclusion is correct because the speaker is financially poor or incorrect because the speaker is financially wealthy

• **Appeal to wealth** (*argumentum ad crumenam*): concluding that a statement is correct because the speaker is rich or that a statement is incorrect because the speaker is poor

• **Argument from silence** (*argumentum ex silentio*): a conclusion based on silence or lack of contrary evidence

• **Appeal to tradition**: where a thesis is deemed correct on the basis that it has a long-standing tradition behind it

• **Chronological snobbery**: where a thesis is deemed incorrect because it was commonly held when something else, clearly false, was also commonly held

• **Genetic fallacy**: where a conclusion is suggested based solely on something or someone's origin rather than its current meaning or context. This overlooks any difference to be found in the present situation, typically transferring the positive or negative esteem from the earlier context.

• **Judgmental language**: insulting or pejorative language to influence the recipient's judgment

• **Poisoning the well**: where adverse information about a target is pre-emptively presented to an audience, with the intention of discrediting or ridiculing everything that the target person is about to say

• **Sentimental fallacy**: it would be more pleasant if; therefore it ought to be; therefore it is

• **Straw man argument**: based on misrepresentation of an opponent's position

• **Style over substance fallacy**: occurs when one emphasizes the way in which the argument is presented, while marginalizing (or outright ignoring) the content of the argument
- **Texas sharpshooter fallacy**: information that has no relationship is interpreted or manipulated until it appears to have meaning
- **Two wrongs make a right**: occurs when it is assumed that if one wrong is committed, another wrong will cancel it out
- **Tu quoque**: the argument states that a certain position is false or wrong and/or should be disregarded because its proponent fails to act consistently in accordance with that position

### Conditional or questionable fallacies

- **Definist fallacy**: involves the confusion between two notions by defining one in terms of the other
- **Luddite fallacy**: related to the belief that labour-saving technologies increase unemployment by reducing demand for labour
- **Broken window fallacy**: an argument which disregards hidden costs associated with destroying property of others.
- **Slippery slope**: argument states that a relatively small first step inevitably leads to a chain of related events culminating in some significant impact