

Common Logical Fallacies

Insufficient or inadequate information poses the greatest threat to the integrity of an argument, but even with adequate material to support it an argument can fail because of structural weaknesses and counterfeit strategies. Suppressed, ignored, or unconsidered evidence can invalidate conclusions. Try to identify the assumptions on which your argument rests, and consider whether your evidence adequately supports your conclusions. Anticipate possible counter-arguments or objections to your methods. Treat your own argument as you would an opponent's, checking for every possible weakness, every advantageous point of attack. Look for failures in logic; challenge your own assumptions. Be aware of the common fallacies in reasoning. These errors involve false judgments of the available factual material, and all lead to untenable conclusions.

1. *Non sequitur*

This term means "it does not follow." A *non sequitur* is an illogical statement, one that seems to draw a conclusion not supported by the premises. All fallacies are on the most elementary level *non sequiturs*, but many can be related to some more specific logical error. The term is used for the general absence of logical coherence, as in the statements below:

<i>non-sequitur</i>	explanation
Education is the only way to combat unemployment.	(many educated people are unemployed)
My essay will get a good grade because I put a lot of effort into it.	(the speaker may not write well, however much effort he or she expends)

Often a statement appears to be a *non sequitur* because the writer has failed to include the assumptions that establish connections between ideas. Often, writers fail to allow for the reader's greater distance from the subject, and forget portions of their syllogisms:

Yeats is Irish, and so he tells a good story.

This sounds like a bit of bigotry; it could be a fragment of an argument, of course:

William Butler Yeats grew up in an Irish social circle that kept alive the tradition of requiring all of its members to entertain the group with their individual accomplishments: singing, playing music, dancing, but above all story-telling.

It is a good practice to bring most assumptions behind an argument out into the open. Each of the other fallacies is also based upon a missing logical link: an unstated assumption or logical transition that the writer protects by leaving it hidden, implied rather than stated. This is a bad practice . . . and a dangerous one.

2. *Ad hominem* (two types)

An *ad hominem* argument evades the task of addressing the question and instead appeals to the feelings of the audience. The link between the personal attack and the matter at issue depends on the identification of the logical validity of the argument with the moral integrity of the speaker: a bad person cannot be right.

<i>ad hominem</i>	explanation
Clinton's infidelity to his wife invalidates his Mideast peace policy.	(marital infidelity has no direct connection with international policy)

In practice, we accept many *ad hominem* arguments. Many actions or beliefs are assumed to colour a person's argument; many arguments are dismissed on the basis of material interests.

3. Appeal to Authority (*argumentum ad verecundiam*)

Inappropriate appeals to authority are very popular in advertising; they depend upon the substitution of a famous name for a serious argument.

appeal to authority	explanation
Drink Vichy water; Paris Hilton does.	(Ms. Hilton may enjoy foul, expensive, or even toxic water)

Here, the implied argument is that because the woman is famous, the water is good. In some contexts, it is right to rely upon the testimony of experts, but problems arise when an expert in one field pronounces upon another. Many popular entertainers lend their names to support political or social causes, recognizing that they are *not* experts in the field but knowing that their support will provide an effective *argumentum ad verecundiam*. Ask yourself:

- Can the matter be decided *without* expert testimony?
- Do experts on this matter actually exist?
- Is this authority an expert *in this field*?
- Is the authority disinterested and unbiased towards one side?
- Do other authorities confirm the opinion of this one?

The world is a complicated place; one can find an equally authoritative counter to almost any "expert opinion."

4. False Analogy

A **false** or **over-extended analogy** is an assertion that because a similarity exists in one aspect, it must also exist in other aspects.

false analogy	explanation
Defending his rationale for pursuing the Vietnam War, president Lyndon Johnson said, "We learned from Hitler at Munich that success only feeds the appetite of aggression."	(Aster, Sidney. "A Shaky Grasp of History." <i>Globe and Mail</i> [Toronto] 25 Feb. 2003:A19) Aster points out that many politicians have relied heavily upon the analogy of appeasing Hitler, whether or not the circumstances justify the comparison.

Analogies lie behind all our complex thinking, but we must beware of accepting them as proof. If we suggest that outlining a report is as necessary to its design as building an architectural model, we might be believed. If we carry the comparison a step further and suggest that the best outlines, on the basis of the architectural analogy, are three-dimensional, we will be laughed at, unless we build a complete and consistent argument in support of this position. Remember that an analogy is not truly an argument but an illustration.

5. Bandwagon Argument (*argumentum ad populum*)

A **bandwagon** argument appeals to the beliefs or prejudices of the crowd. Such arguments often depend on popular generalizations and associations and are widely used in advertising and political campaigns.

bandwagon	explanation
Jim MacPherson should be treasurer; as everyone knows, the Scots are naturally thrifty.	("everyone" may be quite wrong)
Everyone believes Martin's ideas are stupid; Martin must be wrong.	(that most people hold an opinion does not make it right)
Drink this soda pop; it is the choice of a new generation.	(the new generation may be very foolish in their choice)

There are happier names for the appeal to majority opinion, of course: **common sense** is one of the more appealing; **tradition** and **moral wisdom** are applicable as well. Even so, popular opinion should be the beginning, rather than the end, of an investigation.

6. Begging the Question (*petitio principii*) / Circular Reasoning

Begging the question, sometimes considered a synonym for **circular reasoning**, treats matters under debate as already established.

begging the question	explanation
The reason radiography was not discovered sooner was that men whose business it was to discover new clinical methods were coarsening and stupefying themselves with the sensual villainies of vivisection.	(This is adapted, with slight exaggeration, from George Bernard Shaw's Preface to <i>The Doctor's Dilemma</i> ; it places beyond debate whether vivisection makes one stupid, whether it delayed research into radiography, and whether it provides sensual pleasure to scientists.)
We must carefully identify these promoters of hatred so that they can be removed from positions in the public services.	(This assumes that you agree on a definition of "promoters of hatred," and on the necessity of denying them basic human rights; it also assumes that "these" particular haters exist and can be identified.)

Circular reasoning evades a real conclusion by restating the problem in new words; often, arguments that beg the question are founded on circular reasoning. **Circular definition** uses a term to define itself: "an unlikely suspect is one who is not likely to be suspected of a crime." This does not go beyond the original terms in defining itself. Dictionaries often indulge in these: "indignation: *n.* The state of being indignant." Such definitions are sufficient only when the audience already understands (or, in the case of an argument, agrees with) the central term. As arguments, they are failures.

circular reasoning	explanation
Clearly, Mary is failing the class because she cannot manage to achieve at the level required to pass.	(a restatement of a point is not a proof of it)
Sky-diving is dangerous because it is characterized by extreme risks.	(<i>danger IS the presence of extreme risks</i>)
Marxist materialism provides the only sound critique of society because, without the perspective of the economic determination of all social actions and institutions, no valid commentary is possible.	(that all social actions and institutions are economically determined is a central tenet of Marxist thought; thus, the statement is simply an assertion.)

Since the Middle Ages, logicians have pointed out that all reasoning is to some extent circular.

In order to work with any system of thought, a number of definitions and assumptions must be accepted. Naturally, conclusions are provisional, resting on the validity of the system within which each proposal is made. It is possible to distinguish between *degrees* of circularity, of course. The main distinguishing feature of the fallacy is, as in criminal law, the intention behind it. Anyone engaging in argument should be aware of the limitations of his or her position, and of argument in general. Concealing such knowledge from oneself or one's opponent is dishonorable; worse, it is a weak strategy, one which provides one's opponent with excellent ammunition. The arguments above are vicious circles because of their blankly unproductive nature. They lead nowhere but only seem to put certain questions *beyond question*.

7. False Dichotomy ("either...or" fallacy)

This is the fallacious presentation of two possibilities as the *only* possibilities. In many cases there *are* only two possibilities: Everyone must either consume nourishment or die; a battery terminal is either negative or positive. Sometimes a particular perspective is invoked: A Christian's world can be divided into Christians and pagans; in a political situation, those who are not *with* one may effectively count *against* one. Often, however, there are other possibilities, as there are, barring bizarre circumstances, in these cases:

false dichotomy	explanation
Either the government will silence dissenting voices or it will face anarchy.	(this ignores, for instance, providing a forum for debate)
I must pass Calculus, or my life will be ruined.	(this bars second chances and new paths)
Citizens must choose between supporting gun control and supporting murder.	(this could conclude an argument, and so be understood to be specially qualified, but it does not itself comprise a fair statement.)

Again, there are special cases in which only two possibilities exist. Juries must decide on a verdict of "guilty" or "not guilty" (unless they take a third course and fail to agree on a verdict!). In most situations, however, it will be difficult to limit the possibilities to a manageable half-dozen, let alone two.

8. Hasty Generalization

Hasty **generalizations** make poor arguments because they rely upon an non-exhaustive body of evidence. Generalizations may well be right *most* of the time, but they are also wrong *some* of the time. Moreover, they are usually not supported by specific information but by an appeal to common sense or common experience. In short, generalizations present as general and absolute something that is limited and contingent. Often, arguments are based on **anecdotal evidence** on specific, undocumented case histories. The argument for this approach is that it allows areas in which better evidence is not available to be explored. Such exploration is always exciting; the danger is that it is sometimes mistaken for coherent

argument.

hasty generalization	explanation
Mary's husband beats her; men always oppress women.	(that this one case is true proves nothing about <i>all</i> men)
People always offer the cruelest criticism they can.	(what could be the evidence for this?)
My Italian brother-in-law makes superb pasta; all Italian men are great cooks.	(your brother-in-law may be unique)

Generalization is at the heart of all inductive reasoning, of course. We live quite happily with generalizations based on imperfect evidence. Some drivers *may* actually be safer and more competent when they drive in excess of one hundred and twenty kilometers an hour than at lower speeds, and yet our laws assume that this is not so. For that matter, seatbelts can actually injure motorists terribly, and yet our laws represent a generalization about this complex situation. We accept generalizations when we must, but we should be aware of their limitations and not misrepresent or ignore the incompleteness of our research. The heterogeneous nature of people as subjects of discussion is often the real problem. If a spoonful of rice from a rice steamer is cooked, the whole pot is almost certainly ready; people are more likely to unlike one another in significant ways (significant to other people, at least!) than are grains of rice.

9. *Post hoc, ergo propter hoc/cum hoc, ergo propter hoc*

Post hoc, ergo propter hoc, "after this, thus because of this," is an error created by assuming that sequence indicates causation. Many things happen in succession without any direct connection.

<i>post hoc</i>	explanation
Withdrawals have increased substantially since Professor Tod started teaching history at UNB; clearly he has driven students away.	(there is no necessary connection between the higher dropout rates and Tod's teaching; they are related sequentially and the case for causation cannot be assumed)
Many people who enjoy a diet high in cholesterol eventually develop high blood cholesterol; clearly, high dietary cholesterol causes high blood cholesterol.	(even an important factor need not be the only or deciding one; this is a pernicious simplification)

Cum hoc arguments are based on accompaniment rather than sequence, but they are equally fallacious. Avoid such violent simplifications. Correlations of these kinds are not proofs but rather indications of areas ripe with research possibilities. Most good research projects

begin with the recognition of a sequential relationship; no good ones end at that stage.

10. *Reductio ad absurdum*

A *reductio ad absurdum*, also called *indirect proof*, is a legitimate tool under the right circumstances. In the tradition of Zeno and Euclid, it is a proof that works by discovering a contradiction in a proposition *opposite* to one under discussion. Thus, the original proposition must be true if it is a genuine negation of the one being examined. Galileo's rejection of the Aristotelian theory of the rates of falling bodies was a *reductio* of this kind.

Aristotle's claims that a heavy body falls more rapidly than a lighter one must be false. Assume a large body falls at 8 units of speed and a smaller one at only 4. Joined together, the pair would fall at a rate less than 8 but more than 4 units. However, this would be slower than the rate at which the large body itself falls, even though the composite body is still larger and should fall faster. Thus, Aristotle's supposition is false. (adapted from Galileo's *Discorsi*, 1638)

More loosely, the *reductio ad absurdum* is considered the process of indirect proof by pursuing a proposition to a point at which it is contradicted either internally or empirically. Socrates himself disarmed his opponents by showing that one of their cherished beliefs led to absurd conclusions.

Socrates upholds the proposition that virtue is *not* teachable. He assumes first that it *is* teachable. He then proposes that "Themistocles was a good man" and as such would "have desired to make his own son a good man and a gentleman." He then forces his interlocutor, Anytus, to admit that Cleophantus, son of Themistocles, was *not* a man of virtue. Socrates goes on to call upon the examples of the sons of other great men, including Lysimachus, Thucydides, and Pericles. Thus he proves that virtue cannot be taught through the empirical evidence of contrary examples. (adapted and quoted from Benjamin Jowett's translation of Plato's *Meno*)

In the tradition of ethical and legal reasoning, the *reductio* "takes the principles of a doctrine, applies them exactly as their creators did only to an entirely different subject and with horrendous results, and thus shows what absurd conclusions are logically compatible with the original thesis" (Block, 1996, p. 265). The emphasis is thus on attacking a proposition, rather than on indirectly upholding its negation. Naturally, the process is open to abuse, and the proof usually involves taking an opponent's position and "stretching it to its logical conclusion" (Scott, 1990, p. 154). Excessive stretching creates a fallacious counter-argument.

If non-intoxicating beer, ale and porter may be prohibited, and even the use of their names made a criminal offense, because they look like intoxicating liquor, then grape juice, which looks like many kinds of wine, and syruped soda-water, nearly all the varieties of which look like some species of intoxicating liquors, may also be prohibited. It may be properly mentioned in this connection as a *reductio ad absurdum* that water looks like gin! (National Prohibition Cases, 253 U.S. 350 (1919); quoted in Sandra Davidson Scott, "Winning with Words: *Reductio ad absurdum* Arguments. *ETC: A Review of General Semantics* 47.2 (1990): 154-160)

11. Red Herring

A red herring is one that has been salted, dried, and smoked; it has a powerful and distinctive odour. As *Brewer's Dictionary of Phrase and Fable* points out, a red herring "drawn across a fox's path destroys the scent and sets the dogs at fault." In argument, a **red herring** describes a statement introducing an unrelated point instead of addressing the question under debate.

red herring	explanation
Loading students with hours of homework is pointless when the world is about to be destroyed by the greenhouse effect.	(the assignment of homework is irrelevant to the emission of greenhouse gases)
The evaluation of instructors by their students is a serious concern, but the quality of air in the classrooms is a more pressing issue.	(the discussion of the quality of air is irrelevant to the argument)
In spite of the good arguments for accepting more refugees, the debate must be decided on the basis of maintaining Christmas as a spiritual holiday.	(the shift to new matters is unjustified)

Defenders of red herrings suggest that they are simply practicing **lateral thinking**, the creative feat of avoiding a deadlock by taking a new approach to a question. If this is the case, announce it to your audience appropriately.

12. Argument from Ignorance (*argumentum ad ignorantiam*)

Arguments from ignorance assume that because something has *not* been proven false, it is therefore *true*. Conversely, such an argument may assume that because something has not been proven true, it must therefore be false. Note that this is a variation on the **false dichotomy**, since it assumes that all propositions must either be known to be true or known to be false. The absence of disproof is *not* proof.

argument from ignorance	explanation
The US has not proved that Iraq has weapons of mass destruction; therefore, Iraq has no such weapons.	(consider the reverse: Iraq has not disproved that it has weapons of mass destruction; therefore, it has such weapons)
Since we cannot prove that global warming is not happening, it must be happening.	(the lack of negative proof is not the same as positive proof)

The inverse forms of the last two arguments are obvious . . . and popular!

13. Emotionalism

Your capacity to recognize errors in logic has a direct bearing on your capacity to write (and think) in a logical fashion. You should always be on the lookout for the major errors in logic, and also be wary of the feelings or ungrounded opinions that can corrupt logic.

emotionalism	explanation
Paul is unpleasant; he should not be allowed to attend this workshop.	(not only is this illogical, it is a bad tactic and possibly actionable)
I dislike modern poetry; it clearly is not literature.	(this is usually disguised as a more objective statement e.g. "modern poetry is unpleasant and author-centered"; such a feeling should prompt an argument, not substitute for one)
I have been unfairly discriminated against; my outrage is real.	(you may have been treated badly, but your emotion is not proof of this by itself. After all, you may be really outraged by your own failure to achieve.)

It has dawned on me after all these years of being thrilled by parades, Prairies, the flag fluttering at the top of the pole, twilight in Muskoka, a glittering day after an ice storm, and assorted seacoasts where the waves and rocks behave erotically with one another, that Canadians are a nasty lot, have been thoroughly, confidently, serenely rotten throughout their history, and that the War Measures Act just put the ongoing, established, lusty, truly Canadian folk festival of Hate Your Neighbor on a firmer legal basis.

(June Callwood in an uncharacteristically dark mood. This is a good example of *invective*, abusive language used in place of argument)

The legal value of emotion is increasingly important; a victim's perceptions or feelings may be good and sufficient evidence of someone else's misconduct. Such arguments will only be adequate in cases in which a matter is to be decided on *other than logical grounds*. If public policy is being enacted and individual truth is unimportant, or if political objectives outweigh the facts of a situation, logic may indeed be unimportant. In the perfect laboratory of formal, written argument, of course, logic is always in demand. Even those writers who plan to conduct their arguments principally on emotional grounds must recognize what they are doing if they are to have complete control over their materials.