

Logic and Argument

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WHAT IS AN ARGUMENT?

We've talked in depth about what constitutes an argument in [What is an Academic Paper?](#) Still, it's worth repeating the fundamental elements of argument here.

A good argument will have, at the very least:

- a thesis that declares the writer's position on the problem at hand;
- an acknowledgment of the opposition that nods to, or quibbles with other points of view;
- a set of clearly defined premises that illustrate the argument's line of reasoning;
- evidence that validates the argument's premises;
- a conclusion that convinces the reader that the argument has been soundly and persuasively made.

If your paper has these essential features, then you've probably presented a sound argument. Of course, "probably" isn't good enough for the good writer and scholar. How can you be *sure* that your argument is sound?

UNDERSTANDING FORMAL LOGIC

It's important to understand that an argument can be logical without necessarily being true. Consider, for example, the following:

- All women are brilliant.
- I am a woman.
- Therefore, I am brilliant.

Is this argument logical? Indeed, it is. The test for logic in this instance is not whether the statement is reasonable, but whether the argument follows the almost mathematical construction of the *syllogism*.

A syllogism, like the one above, is made up of three statements: the major premise, or general observation; the minor premise, or particular observation; and the conclusion, which is something that one might rightly deduce from the premises given.

Consider the following syllogism, and note how it differs from the one above:

- Everyone who has been exposed to the Ebola virus has died.
- John Q. has been exposed to the Ebola virus.
- John Q. will die.

What is the difference between the two syllogisms? It's very clear that in the first syllogism, the major premise is not true. Surely there are women in the world who are not brilliant. On the other hand, the major premise of the second syllogism we can accept as true. While there may in fact be people who have been exposed to this virus and lived, we have no record of them. On the other hand, every case of Ebola that we've seen has resulted in death. Therefore, we can proceed confidently from our major premise to a conclusion that is sound.

Of course, in any syllogism all premises must be true (or considered true) if the argument is to stand. Consider the following syllogism:

- Murder is a terrible crime.
- Abortion is murder.
- Abortion is a terrible crime.

In this case, it is the minor premise that is most open to challenge. Is abortion indeed murder? If the writer can convince his reader that it is, then the reader will accept his conclusion.

This way of arguing is called **deduction**. When one deduces, she moves from a general argument to a specific argument. The great detective Sherlock Holmes was famous for his deductive arguments. A crime might be solved, for example, along these lines:

- All watchdogs bark at strangers.
- When X was murdered, the dogs did not bark.
- X was not killed by a stranger.

Most detectives, however, use a different kind of reasoning when they try to solve a crime: **inductive reasoning**. When you reason inductively, you observe the specific(s) and move to the general. Detectives like Columbo and Kojak might gather their clues from specific observations. From these observations they then determine inductively who the murderer is.

It's important to note that many of the major premises used in syllogisms are often arrived at through inductive reasoning. For example, epidemiologists studying the Ebola virus certainly had to observe the disease carefully before they could come to the general observation that Ebola always kills. If we recall the early days of the AIDS virus, we will remember that researchers were initially stumped by the illness. Because so many cases in America involved gay men, researchers erroneously dubbed the disease, "Gay Cancer." When they began to gather more information about the disease, researchers were able to understand that the disease is a virus passed from one individual to another via bodily fluids. AIDS is not cancer. Nor is it a gay disease.

Reasoning inductively is perhaps more difficult than reasoning deductively, because it is easy to make a mistake in your observations. It is also possible that the evidence you have to work with isn't complete, making it difficult to draw persuasive conclusions.

REVIEWING YOUR ARGUMENT'S EVIDENCE

So how do you create an argument with solid premises? You review your evidence, making sure that it is fair, objective, and complete.

Ask yourself the following questions about the evidence in your paper.

- *Have you suppressed any facts?*

The opponent's point of view needs to be reckoned with, not ignored. Perhaps you are in the middle of writing what you think is a brilliant paper that argues that Christianity as we know it was created (or recreated) by Paul. You discover a compelling argument that states otherwise. (Or, even more depressing, you discover a book that steals your thunder.) Resist the temptation to pretend that you never saw these books. Work them into your argument in such a way that your work as a whole is strengthened by their presence.

- *Have you manipulated any facts?*

Sometimes we dig up information that can only loosely support our point of view. But we need that information in order to make our argument stand. Is it fair to stretch the information to suit our own purposes? Absolutely not - unless you are going to acknowledge the stretch to the reader, and leave it to him to decide whether your stretch is a fair one.

- *Do you have enough evidence?*

Review the main points of your argument and consider whether or not each point is convincing based on the evidence alone. Do you find yourself relying on your rhetoric alone to make a point? If you are, you may need to return to your sources for evidence.

- *Do you have too much evidence?*

Take a look at your paper. Do your quoted passages outweigh your own prose? If so, perhaps your argument has been buried under the arguments of others. It's likely, too, that your reader will find so much information difficult to wade through. She'll be looking hard for an argument that may in fact be impossible to find.

- *Is your evidence current? Reputable?*

It's not that you can't use dated sources in a paper, it's simply that you run the risk of not considering more current information that might challenge your point of view. You've also got to make sure that your evidence is reputable. Remember the dictum, "You can't believe everything you read." This is especially true of information you find on the Internet, where anyone can post anything, sometimes without the slightest concern for its validity.

AVOIDING LOGICAL FALLACIES

Logical fallacies are mistakes in reasoning. They may be intentional or unintentional, but in either case they undermine the strength of an argument. Some common fallacies are defined below.

1. **Hasty Generalization:** A generalization based on too little evidence, or on evidence that is biased. Example: All men are testosterone-driven idiots. Or: After being in New York for a week, I can tell you: all New Yorkers are rude.
2. **Either/Or Fallacy:** Only two possibilities are presented when in fact several exist. Example: America: love it or leave it. Or: Shut down all nuclear power plants, or watch your children and grandchildren die from radiation poisoning.
3. ***Non Sequitur*:** The conclusion does not follow logically from the premise. Example: My teacher is pretty; I'll learn a lot from her. Or: George Bush was a war hero; he'll be willing to stand tough for America.
4. ***Ad Hominem*:** Arguing against the man instead of against the issue. Example: We can't elect him mayor. He cheats on his wife! Or: He doesn't really believe in the First Amendment. He just wants to defend his right to see porno flicks.
5. **Red Herring:** Distracting the audience by drawing attention to an irrelevant issue. Example: How can he be expected to manage the company? Look at how he manages his wife! Or: Why worry about nuclear war when we're all going to die anyway?
6. **Circular Reasoning:** Asserting a point that has just been made. Sometimes called "begging the question." Example: She is ignorant because she was never educated. Or: We sin because we're sinners.

7. False Analogy: Wrongly assuming that because two things are alike in some ways, they must be alike in all ways. Example: An old grandmother's advice to her granddaughter, who is contemplating living with her boyfriend: "Why should he buy the cow when he can get the milk for free?"
8. *Post Hoc, Ergo Propter Hoc*: The mistake of assuming that, because event *a* is followed by event *b*, event *a* caused event *b*. Example: It rained today because I washed my car. Or: The stock market fell because the Japanese are considering implementing an import tax.
9. Equivocation: Equates two meanings of the same word falsely. Example: The end of a thing is its perfection; hence, death is the perfection of life. (The argument is fallacious because there are two different definitions of the word "end" involved in the argument.)

LINKS

- [Critical Thinking on the Web: A Directory of Quality Online Writing Materials](#) (Univ. of Melbourne)

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