Fallacies are defects that cause an argument to be invalid, unsound, or weak. Logical fallacies can be separated into two general groups: formal and informal. A formal fallacy is a defect which can be identified merely by looking at the logical structure of an argument, rather than at any specific statements. Informal fallacies are defects which can be identified only through an analysis of the actual content of the argument.

Formal Fallacies

Formal fallacies are found only in [deductive arguments](https://www.learnreligions.com/deductive-and-inductive-arguments-249754) with identifiable forms. One of the things which makes them appear reasonable is the fact that they look like and mimic valid logical arguments, but are in fact invalid. Here is an example:

1. Premise: All humans are mammals.
2. Premise: All cats are mammals.
3. Conclusion: All humans are cats.

Both premises in this argument are true, but the conclusion is false. The defect is a formal fallacy, and can be demonstrated by reducing the argument to its bare structure:

1. All A are C
2. All B are C
3. All A are B

It does not matter what A, B, and C stand for. We could replace them with "wines," "milk," and "beverages." The argument would still be invalid for the exact same reason. It can be helpful to reduce an argument to its structure and ignore content in order to see if it is valid.

Informal Fallacies

Informal fallacies are defects which can be identified only through an analysis of the actual content of the argument, rather than through its structure. Here is an example:

1. Premise: Geological events produce [rock](https://www.thoughtco.com/how-to-look-at-a-rock-1441184).
2. Premise: Rock is a type of music.
3. Conclusion: Geological events produce music.

The premises in this argument are true but clearly, the conclusion is false. Is the defect a formal fallacy or an informal fallacy? To see if this is actually a formal fallacy, we have to break it down to its basic structure:

1. A = B
2. B = C
3. A = C

This structure is valid. Therefore, the defect cannot be a formal fallacy and must instead be an informal fallacy that is identifiable from the content. When we examine the content, we find that a key term ("rock") is being used with two different definitions.

Informal fallacies can work in several ways. Some distract the reader from what is really going on. Some, like in the above example, make use of ambiguity to cause confusion.

Defective Arguments

There are many ways to categorize fallacies. [Aristotle](https://www.learnreligions.com/aristotle-biography-250520) was the first to try to systematically describe and categorize them, identifying 13 fallacies divided into two groups. Since then, many more have been described and the categorization has become more complicated. The categorization used here should prove useful, but it is not the only valid way of organizing fallacies.

* Fallacies of Grammatical Analogy

Arguments with this defect have a structure that is grammatically close to arguments which are valid and make no fallacies. Because of this close similarity, a reader can be distracted into thinking that a bad argument is actually valid.

* Fallacies of Ambiguity

With these fallacies, some sort of ambiguity is introduced either in the premises or in the conclusion itself. This way, an apparently false idea can be made to appear true so long as the reader does not notice the problematic definitions.

Examples:

* Equivocation Fallacy
* [No True Scotsman Fallacy](https://www.thoughtco.com/the-no-true-scotsman-fallacy-250339)
* [Quoting out of Context](https://www.thoughtco.com/quoting-out-of-context-fallacy-250332)
* Fallacies of Relevance

These fallacies all make use of premises which are logically irrelevant to the final conclusion.

Examples:

* Ad Hominem
* [Appeals to Authority](https://www.thoughtco.com/logical-fallacies-appeal-to-authority-250336)
* Appeals to Emotion and Desire
* Fallacies of Presumption

Logical fallacies of presumption arise because the premises already assume what they are supposed to prove. This is invalid because there is no point in trying to prove something you already assume to be true. No one who needs to have something proven to them will accept a premise which already assumes the truth of that idea.

Examples:

* [Begging the Question](https://www.thoughtco.com/begging-the-question-petitio-principii-250337)
* Complex Question
* [False Dilemma](https://www.thoughtco.com/false-dilemma-fallacy-250338)
* Fallacies of Weak Induction

With this type of fallacy, there may be an apparent logical connection between the premises and the conclusion. However, if that connection is real, then it is too weak to support the conclusion.

Examples:

* [Ad Hoc Rationalization](https://www.learnreligions.com/ad-hoc-explanations-causes-and-rationalization-3968430)
* [Oversimplification & Exaggeration](https://www.thoughtco.com/oversimplification-and-exaggeration-fallacies-3968441)

**eginner’s Guide to Logical Fallacies (With Examples)**

So, what is a logical fallacy exactly? And why should you know?

By definition, logical fallacies are reasoning errors that weakens your argument or leads to an invalid conclusion. They are commonplace in politics, advertising, media and in our everyday discussions and debates, whether online on social media or in-person with our neighbor. Fallacies can be committed unintentionally or used deliberately in an attempt to influence someone’s thinking, opinions, and actions.

Studying logical fallacies and understanding them will help you to sharpen your critical thinking skills: you’ll be able to examine and evaluate arguments more efficiently and to form better, more persuasive arguments of your own.

Let’s look more closely at what logical fallacies are, how understanding them can benefit you, and examples of some of the most common fallacies.

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**Logical Fallacy**

A logical fallacy is the use of erroneous reasoning that weakens an argument or renders the conclusion invalid. They can be committed unintentionally due to sloppiness or lack of a better understanding of them, however, often they are committed deliberately to gain an advantage in a debate by influencing people’s opinions.

The word “fallacy” comes from the Latin word “fallacia”, which translates to “deceit”, “deception” or “trick”. As such, these words describe logical fallacies quite accurately: fallacious arguments are often persuasive, appealing, and are used in an attempt to trick or fool someone.

A logical fallacy is a false statement that weakens an argument by distorting an issue, drawing false conclusions, misusing evidence, or misusing language.

*Dave Kemper et al., Fusion: Integrated Reading and Writing. Cengage, 2015.*

Logical fallacies were first introduced by Aristotle, who identified thirteen fallacies in his *Sophistical* *Refutations*. He didn’t only show how to win an argument by making logically valid claims, but he also demonstrated how to refute some of the opponent’s invalid claims. He called them sophistical and contentious arguments.

Classifying fallacies accurately is challenging because of the large variety of their application and structure. There are hundreds of identified logical fallacies and more than two dozen types and sub-types of them, however, they can be divided into two broad categories; formal and informal fallacies.

**Formal Fallacy**

Formal fallacy (or deductive fallacy) refers to a flaw in the structure of a deductive argument that renders the conclusion invalid. A deductive argument is intended to provide a necessarily valid conclusion if the premises are true, and its validity is dependant on the structure of the argument.

All formal fallacies are [*non sequiturs*](https://www.merriam-webster.com/dictionary/non%20sequitur), which means that the conclusion is not supported by what preceded it.

Even though the premises and even the conclusion may, in fact, be true in an argument that contains a formal fallacy, the conclusion cannot follow logically from the given premises due to the error in the argument’s structure.

*Affirming the consequent* is a typical type of formal fallacy, which logical form looks like this:

1. If A is true, then B is true.
2. B is true.
3. Therefore, A is true.

One example of this would be:

1. If it’s raining, then the streets are wet.
2. The streets are wet.
3. Therefore, it’s raining.

This argument doesn’t hold water since the conclusion doesn’t follow from these premises due to a flaw in its logical structure, although the conclusion and premises may be factually true.

[*The fallacy fallacy*](https://fallacyinlogic.com/argument-from-fallacy-definition-and-examples/), also known as “the argument from fallacy”, is a formal fallacy based on the assumption that if an argument contains a logical fallacy, then its conclusion must be invalid. For example:

* **Jon**: “UFOs exist because a scientist said so.” **Arnold**: “That is a fallacious argument. Just because a scientist said so doesn’t mean that they must necessarily exist. Therefore, UFOs don’t exist.”

*Appeal to probability* is another formal fallacy which occurs when someone assumes that because something is probable to happen, it will happen:

* “There are billions and billions of planets in the universe, therefore there must be another planet with intelligent life on it.”

**Informal Fallacy**

While formal fallacies are concerned with structural errors in deductive arguments, informal fallacies deal with the non-structural errors in arguments. Although informal fallacies can also apply to deductive arguments, they typically refer to errors in inductive arguments.

An inductive argument is an argument that is meant to provide strong enough premises to support only a probable truth of the conclusion. The success of an inductive argument relies on the evidence supporting the conclusion, that is, on the strength of its premises.

Informal fallacies are much more common than formal fallacies, and there is an almost infinite variety of them. Furthermore, they can be challenging to spot and evaluate; there are so many different ways and variations the premises of an argument can fail to provide sufficient support for the conclusion.

The following is one example of a reasonable inductive argument:

* “I’ve had my car for 5 years and it has never broken down. So, it won’t break down tomorrow.”

If the premise that the car has never broken down in 5 years is true, then it would be unlikely that it will break down tomorrow. The premise is strong enough to warrant a probable truth of the conclusion.

Another reasonably strong inductive argument would be:

1. Pregnancy tests are around 98% accurate.
2. Chloe got a positive result on a pregnancy test.
3. Chloe is pregnant.

Due to the complex nature of informal fallacies, they are organized into three sub-categories; fallacies of ambiguity, fallacies of relevance and fallacies of sufficiency.

**FALLACIES OF AMBIGUITY**

These are fallacies that are caused by a lack of clarity. Some examples of these include:

* ***Accent fallacy*** – placing unusual stress or emphasis on certain words to change the meaning of a sentence.
* ***Composition fallacy*** – assuming that if something is true of the parts, it must be true of the whole.

**FALLACIES OF RELEVANCE**

Fallacies of relevance attempt to persuade by using non-logical means. They use emotional appeals as evidence to support the conclusion.

* ***Ad hominem*** – shifting focus from the argument with personal attacks.
* ***The straw man fallacy*** – distorting an opponent’s argument to gain an advantage.
* ***Appeal to pity*** – using pity in an attempt to distract from the truth of the conclusion.
* ***Appeal to force***– threatening someone to get an acceptance for a conclusion.

**FALLACIES OF SUFFICIENCY**

This refers to fallacies that occur when the evidence fails to provide strong enough support for the conclusion.

* ***Hasty generalization*** – drawing a conclusion from an insufficient sample.
* ***False dichotomy/False dilemma*** – presenting only two possible choices when more alternatives exist.
* ***Weak analogy*** – drawing a connection between two things, even though the connection is insufficient for a conclusion.

**Why Is It Important to Understand Logical Fallacies?**

Logical fallacies are an important part of logic, critical thinking, and argumentation. They are a common occurrence in arguments and debates everywhere; in politics, advertising, philosophical debates, as well as in our everyday discussions on internet forums or in-person with our friends and acquaintances.

We often want and need to persuade others that our opinions and arguments are valid, both in writing and verbally. Optimally, we should be doing it by using proper and sound reasoning, however, a lot of the time persuaders take shortcuts and use logical fallacies – intentionally or not – to try to prove their point. Using fallacies is a powerful tactic to persuade, and they often fly undetected under someone’s radar who doesn’t have a skillset to spot and counter them.

As William R. Smalzer explained the importance of fallacies in writing in his *Write to Be Read*:

There are three good reasons to avoid logical fallacies in your writing. First, logical fallacies are wrong and, simply put, dishonest if you use them knowingly. Second, they take away from the strength of your argument. Finally, the use of logical fallacies can make your readers feel that you do not consider them to be very intelligent.

*William R. Smalzer, Write to Be Read: Reading, Reflection, and Writing, 2nd ed. Cambridge Univ. Press, 2005.*

Studying logical fallacies has multiple attractive benefits that can enrich anyone’s life, including:

* You’ll be able to better evaluate your own or other people’s arguments and to spot and counter logical fallacies that weakens or invalidates an argument.
* It’ll help you to develop your vocabulary, reduce biases and to form better, more persuasive arguments using proper evidence and good reasoning, which will
make you seem more credible and help you to reach your own goals.
* Being able to recognize bad arguments and poor reasoning helps you to defend yourself from persuaders who want to influence your beliefs, values or actions in a way that may be against your self-interests.

Note that it is almost always easier to spot errors in other’s arguments than on your own, whether you are an expert or a beginner.

**Examples of Logical Fallacies**

If you’ve read the whole article until this point, you should now have a basic understanding of what a logical fallacy is, how they are broadly organized into formal and informal fallacies and the benefits of learning about them.

Now, let’s take a look at how some of the most common logical fallacies work with examples of them.

**Red Herring**

[*Red herring*](https://fallacyinlogic.com/red-herring-fallacy-the-definition-and-examples/), also known as “changing the subject” and “beside the point”, works by derailing the original argument to a different, irrelevant topic. It’s a deliberate attempt to move the focus away from the argument. For instance, the following phrase can be seen as an example of this:

* “There are children starving in Africa. You have to empty your plate.”

In this tweet, Donald Trump commits the *red herring fallacy*:

**Ad Hominem**

[*Ad hominem*](https://fallacyinlogic.com/ad-hominem-fallacy/) refers to personal attacks against the arguer instead of criticizing the argument itself. The attacks can be directed towards their character, morals, background, intelligence or reputation.

Name-calling an opponent instead of trying to refute their claim is extremely common in any type of argument.

* “You didn’t even finish high school. How could you possibly know about this?”

Another example from Donald Trump’s twitter, containing*ad hominem*:

**The Straw Man Fallacy**

[*The straw man*](https://fallacyinlogic.com/beginners-guide-to-the-straw-man-fallacy/) occurs when an opponent attacks a distorted version of the original argument that they have themselves created. It’s an intentionally exaggerated or misrepresented version of the argument which likely gives the arguer an advantage over their opponent.

* **John**: “I believe sport hunting is immoral.” **Michael**: “So you want us all to be vegetarians because animals are more important than people?!”
* **Kim**: “I think our company should allocate a larger portion of the budget to customer support because we are struggling in that area.” **Andy**: “We’ll go bankrupt if we spend all our money on customer support.”

**Bandwagon Fallacy**

[*Bandwagon*](https://fallacyinlogic.com/bandwagon-fallacy-definition-and-examples/), also known as “appeal to common belief” and “appeal to popularity”, is a logical fallacy that occurs when something is assumed to be good or true solely because it is popular. In other words, it’s an assumption that a majority’s opinion is always valid.

* “Intermittent fasting is the most popular way to lose weight right now. It must be the right way to do it.”
* “McDonald’s is the best fast food restaurant in the world, they have served 100 billion people in the world.”

**Slippery Slope**

This particular [fallacy](https://fallacyinlogic.com/slippery-slope-fallacy-definition-and-examples/) works by taking the argument from a relatively small first step to an ultimate conclusion via a number of inaccurate connections. The conclusion is usually some sort of extreme.

* “If I let my child play video games, she will not do her homework, her grades will suffer, and she won’t be able to go to college.”
* “If we legalize gay marriage, next people will want to legalize polygamy.”

**Appeal to Nature**

This fallacy is based on the belief that if something is natural, it must be good or the right thing to do, and something that is unnatural must be bad. For example:

* “Homosexuality is wrong because procreation can only naturally happen between heterosexual couples.”
* “Herbal medicines are natural, unlike antibiotics and other modern medicines. Therefore, they are better for you.”