

# Logical Fallacies

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## WHAT'S COVERED

### 1. Errors in Reasoning— Formal and Informal

- a. Formal Fallacies
- b. Informal Fallacies

## 1. Errors in Reasoning— Formal and Informal

A **fallacy** is an error in reasoning. There are two basic categories of fallacies:

- Formal
- Informal



### TERM TO KNOW

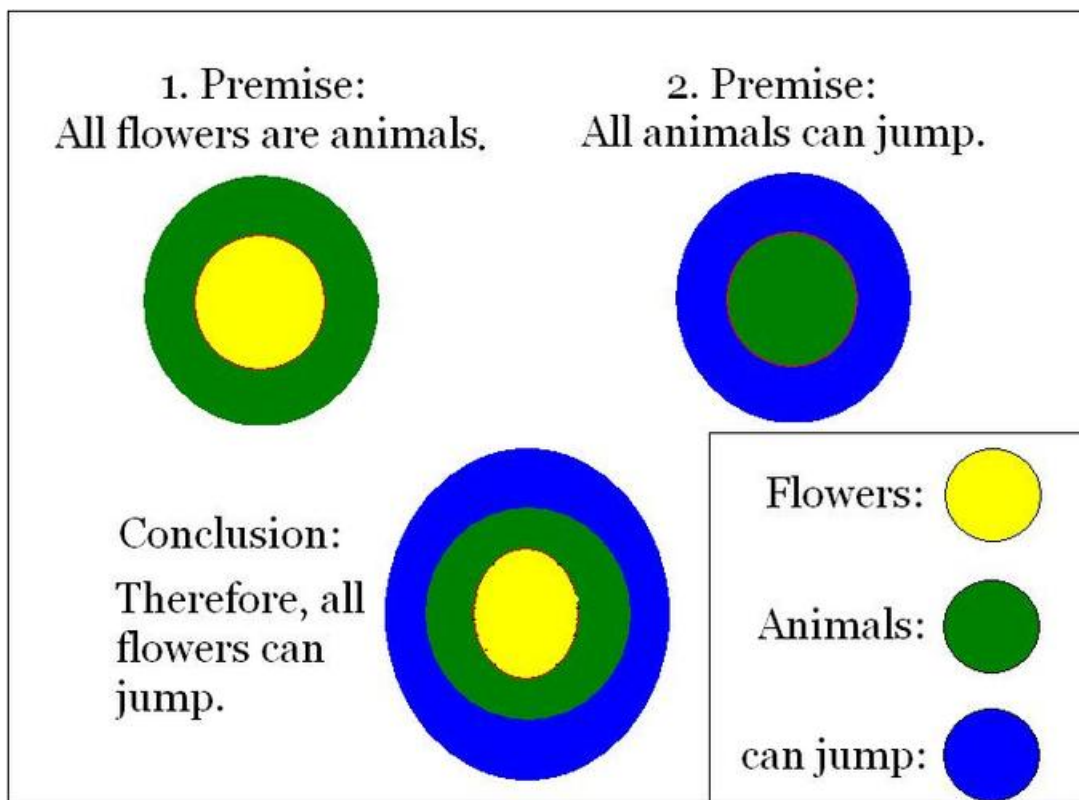
#### **Fallacy**

An error in reasoning often due to a misconception or a presumption; used in informal discourse to mean an argument which is problematic for any reason.

#### **1a. Formal Fallacies**

Formal fallacies occur when there is a problem with the form, or structure, of the argument. "*Formal*" refers to the *form* of the argument. An argument that contains a formal fallacy will always be invalid.

Consider an example with a visualization of faulty reasoning involving categorical deduction.



1. All flowers are animals.
2. All animals can jump.
3. Therefore, all flowers can jump.

Even though it is quite obvious that the first premise is not true and further that the conclusion is not true, the whole syllogism is still valid. By applying formal logic to the syllogism in the example, the conclusion is still valid.

### 1b. Informal Fallacies

An informal fallacy is an error in reasoning that occurs due to a problem with the *content*, rather than mere *structure*, of the argument. In informal logic and rhetoric, a fallacy is usually an error in reasoning often due to a misconception or a presumption.

Some of the more frequent common logical fallacies are:

Common Logical Fallacy	Description
Converse fallacy of accidental or hasty generalization	Argues from limited examples or a special case to a general rule. <i>Argument:</i> Every person I've met has ten fingers, therefore, all people have ten fingers. <i>Problem:</i> Those, <i>who have been met</i> are not a representative subset of the entire set.
Making the argument personal ( <i>argumentum ad</i>	Attacking or discrediting the opposition's character. <i>Argument:</i> What do you know about the U.S? You aren't even a citizen. <i>Problem:</i> personal argument against an opponent, instead of against the opponent's argument.

<i>hominem</i> )	
Popular sentiment or bandwagon appeal ( <i>argumentum ad populum</i> )	An appeal to the majority; appeal to loyalty. <i>Argument:</i> Everyone is doing it. <i>Problem:</i> Concludes a proposition to be true because many or most people believe it.
<b>Red herring</b> ( <i>Ignoratio Elenchi</i> )	Intentionally or unintentionally misleading or distracting from the actual issue. <i>Argument:</i> I think that we should make the academic requirements stricter for students. I recommend that you support this because we are in a budget crisis and we do not want our salaries affected. <i>Problem:</i> Here the second sentence, though used to support the first, does not address the topic of the first sentence, instead switching the focus to the quite different topic.
Fallacy of false cause ( <i>non sequitur</i> )	Incorrectly assumes one thing is the cause of another. Non Sequitur is Latin for "It does not follow." <i>Argument:</i> I hear the rain falling outside my window; therefore, the sun is not shining. <i>Problem:</i> The conclusion is false because the sun can shine while it is raining.
If it comes before it is the cause ( <i>post hoc ergo propter hoc</i> )	Believing that temporal succession implies a causal relation. <i>Argument:</i> It rained just before the car died. The rain caused the car to break down. <i>Problem:</i> There may be no connection between the two events.
Two events co-occurring is not causation ( <i>cum hoc ergo propter hoc</i> )	Believing that correlation implies a causal relation. <i>Argument:</i> More cows die in the summer. More ice cream is consumed in summer months. Therefore, the consumption of ice cream in the summer is killing cows. <i>Problem:</i> No premise suggests the ice cream consumption is causing the deaths. The deaths and consumption could be unrelated, or something else could be causing both, such as summer heat.
Fallacy of many questions or loaded question ( <i>Plurium Interrogationum</i> )	Groups more than one question in the form of a single question. <i>Argument:</i> Have you stopped beating your wife? <i>Problem:</i> Either a yes or no answer is an admission of guilt to beating your wife.
<b>Straw man</b>	Creates the illusion of having refuted a proposition by replacing it with a superficially similar proposition (the "straw man"), and refuting it, without ever actually refuting the original. <i>Argument:</i> Person A: Sunny days are good Person B: If all days were sunny, we'd never have rain, and without rain, we'd have famine and death. Therefore, you are wrong. <i>Problem:</i> B has misrepresented A's claim by falsely suggesting that A claimed that only sunny days are good, and then B refuted the misrepresented version of the claim, rather than refuting A's original assertion.
The false dilemma or either-or fallacy	The listener is forced to make a choice between two things which are not really related or relevant. <i>Argument:</i> If you are not with us, you are against us. <i>Problem:</i> The presentation of a false choice often reflects a deliberate attempt to eliminate any middle ground.
Card-stacking,	Deliberate action is taken to bias an argument by selective use of facts with opposing evidence being buried or discredited. <i>Argument:</i> Learn new skills, become a leader and

or cherry  
picking

see the world. *Problem:* Only the positive benefits of military service are used to recruit ,  
and not the hazards.



## BIG IDEA

As a speaker you want to carefully consider your reasoning and how you draw your logical conclusions in order to avoid faulty reasoning.



## TERMS TO KNOW

### Red Herring

A clue or information that is or is intended to be misleading, that diverts attention from a question; often thought to relate to using smelly fish to train dogs to recognize the real scent of something they were suppose to be tracking.

### Straw Man

An insubstantial concept, idea, endeavor or argument, particularly one deliberately set up to be weakly supported, so that it can be easily knocked down; especially to impugn the strength of any related thing or idea.



## SUMMARY

In this lesson, you learned that **errors in reasoning** can be formal or informal. An argument that contains a **formal fallacy** will always be invalid. However, even if a premise is not accurate, the formal conclusion could still be valid if the rules of logic are followed. An **informal fallacy** is an error in reasoning that occurs due to a problem with the content, rather than mere structure, of the argument and is often due to a misconception or a presumption.

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