

Informal Fallacies

Based on Chapter 3 of Patrick Hurley's "A Concise Introduction to Logic (11th Edition)", Cengage Learning 2010.

Fallacies

- A fallacy is a defect in an argument that consists in something other than false premises alone.
- Another term for fallacy is “non sequitur”, which literally means “it does not follow”
- For a deductive arguments,
 - an argument containing fallacies are unsound
 - an unsound argument either has false premises or contains fallacies (or both)

Formal Fallacies

- Fallacies can be divided into two groups: formal and informal
- Formal fallacies: fallacies which can be detected from the form of the argument, i.e. no need to understand the content of the argument.

- For example

If apes are intelligent, then apes can solve puzzles.

Apes can solve puzzles.

Therefore, apes are intelligent.

- This argument is of the form

If A then

B

$\therefore A$

Informal Fallacies

- Informal fallacies: fallacies which can be detected only by examining the content of the argument. Consider the following arguments:

The Brooklyn Bridge is made of steel.

Steel is heavy.

Therefore, the Brooklyn Bridge is heavy.

and

The Brooklyn Bridge is made of atoms.

Atoms are invisible.

Therefore, the Brooklyn Bridge is invisible.

Classification of Informal Fallacies

- Logicians have been studying informal fallacies typically occurring in arguments and classifying them.
- Hurley divides 22 kinds of informal fallacies into 5 groups:
 1. Fallacies of relevance
 2. Fallacies of weak induction
 3. Fallacies of presumption
 4. Fallacies of ambiguity
 5. Fallacies of grammatical analogy

1. Fallacies of Relevance

Fallacies of relevance occur in arguments where the premises are logically irrelevant to the conclusion, though they may be psychologically relevant.

1.1 Appeal to Force

- **Appeal to Force (Argumentum ad Baculum: Appeal to the “Stick”)**
An arguer poses a conclusion to another person and tells that person either implicitly or explicitly that some harm will come to him or her if he or she does not accept the conclusion.

Child to playmate: Sesame Street is the best show on TV; and if you don't believe it, I'm going to call my big brother over here and he's going to beat you up.

Secretary to boss: I deserve a raise in salary for the coming year. After all, you know how friendly I am with your wife, and I'm sure you wouldn't want her to find out what's been going on between you and that sexpot client of yours.

1.2 Appeal to Pity

- **Appeal to Pity (Argumentum ad Misericordiam)**

An arguer attempts to support a conclusion by merely evoking pity from the reader or listener.

Taxpayer to judge: Your Honor, I admit that I declared thirteen children as dependents on my tax return, even though I have only two. But if you find me guilty of tax evasion, my reputation will be ruined. I'll probably lose my job, my poor wife will not be able to have the operation that she desperately needs, and my kids will starve. Surely I am not guilty.

1.3 Appeal to People

- **Appeal to People (Argumentum ad Populum)**

Nearly everyone wants to be loved, esteemed, admired, valued, recognized, and accepted by others. The appeal to the people uses these facts to get the reader or listener to accept a conclusion.

- A typical structure is this

You want to be accepted/included in the group/loved/esteemed...

Therefore, you should accept XYZ as true.

1.3 Appeal to People

- **Direct approach (aiming at the crowd):** an arguer, addressing a large group of people, excites the emotions and enthusiasm of the crowd (“Mob Mentality”) to win acceptance for his or her conclusion. Often used by propagandist.
 - **Appeal to negative motions** works in similar way, but inciting fear and suspicion, instead of enthusiasm or euphoria.

1.3 Appeal to People

- **Indirect approach (aiming at an individual):** an arguer uses the relationship of an individual with the crowd to convince him/her. Often used in advertisement.

Bandwagon argument

Of course, you want to buy Zing toothpaste. Why? 90 percent of America brushes with Zing.

Appeal to vanity

The Few, the Proud, the Marines.

Appeal to snobbery:

A Rolls-Royce is not for everyone. If you qualify as one of the select few, this distinguished classic may be seen and driven at British Motor Cars, Ltd.

Mother to child: You want to grow up and be just like Wonder Woman, don't you? Then eat your liver and carrots.

1.4 Argument Against the Person

- **Argument Against the Person (Argumentum ad Hominem)**

This fallacy involves two arguers. One of them expresses a certain argument, and the other responds by directing his/her attention not to the argument but to the first person himself.

Ad hominem abusive

Television entertainer Bill Maher argues that religion is just a lot of foolish nonsense. But Maher is an arrogant, shameless, self-righteous pig. Obviously, his arguments are not worth listening to.

1.4 Argument Against the Person

Ad hominem circumstantial

The Dalai Lama argues that China has no business in Tibet and that the West should do something about it. But the Dalai Lama just wants the Chinese to leave so he can return as leader. Naturally, he argues this way. Therefore, we should reject his arguments.

tu quoque (“you too”): “How dare you argue that I should stop doing X; why, you do X yourself.”

Political operative Newt Gingrich has argued about the need to preserve family values. But who is he to talk? Gingrich has been married three times. He divorced his first wife while she was hospitalized for cancer, and he engaged in an extramarital affair while he was married to his second wife. Clearly, Gingrich’s arguments are trash.

1.5 Accident

- **Fallacy of accident**

A general rule is applied to a specific case it was not intended to cover.

Freedom of speech is a constitutionally guaranteed right. Therefore, John Q. Radical should not be arrested for his speech that incited the riot last week.

People are obligated to keep their promises. When Jessica married Tyler, she promised to stay with him for life. Therefore, she should stay with him now, even though he has become an abusive spouse addicted to gambling and drugs.

1.6 Straw Man

- **Straw man fallacy**

An arguer distorts an opponent's argument for the purpose of more easily attacking it, demolishes the distorted argument, and then concludes that the opponent's real argument has been demolished.

- By so doing, the arguer is said to have set up a straw man and knocked it down, only to conclude that the real man has been knocked down as well.

1.6 Straw Man

Mr. Goldberg has argued against prayer in the public schools. Obviously Mr. Goldberg advocates atheism. But atheism is what they used to have in Russia. Atheism leads to the suppression of all religions and the replacement of God by an omnipotent state. Is that what we want for this country? I hardly think so. Clearly Mr. Goldberg's argument is nonsense.

The garment workers have signed a petition arguing for better ventilation on the work premises. Unfortunately, air-conditioning is expensive. Air ducts would have to be run throughout the factory, and a massive heat exchange unit installed on the roof. Also, the cost of operating such a system during the summer would be astronomical. In view of these considerations the petition must be rejected.

1.7 Missing the Point

- **Missing the Point (Ignoratio Elenchi)**

The premises of an argument support one particular conclusion but not the conclusion explicitly claimed by the arguer.

- Ignoratio elenchi means “ignorance of the proof.” The arguer is ignorant of the logical implications of his or her own premises and, as a result, draws a conclusion that misses the point entirely.

Crimes of theft and robbery have been increasing at an alarming rate lately. The conclusion is obvious: We must reinstate the death penalty immediately.

Abuse of the welfare system is rampant nowadays. Our only alternative is to abolish the system altogether.

1.8 Red Herring

- **Red Herring**

The arguer diverts the attention of the listener by changing the subject to a different but sometimes subtly related one, then finishes by either drawing a conclusion about this different issue or by merely presuming that some conclusion has been established.

Environmentalists are continually harping about the dangers of nuclear power. Unfortunately, electricity is dangerous no matter where it comes from. Every year hundreds of people are electrocuted by accident. Since most of these accidents are caused by carelessness, they could be avoided if people would just exercise greater caution.

1.8 Red Herring

There is a good deal of talk these days about the need to eliminate pesticides from our fruits and vegetables. But many of these foods are essential to our health. Carrots are an excellent source of vitamin A, broccoli is rich in iron, and oranges and grapefruit have lots of vitamin C.

Professor Conway complains of inadequate parking on our campus. But did you know that last year Conway carried on a torrid love affair with a member of the English Department? The two used to meet every day for clandestine sex in the copier room. Apparently, they didn't realize how much you can see through that fogged glass window. Even the students got an eyeful. Enough said about Conway.

2. Fallacies of Weak Induction

The connection between premises and conclusion is not strong enough to support the conclusion.

2.1 Appeal to Unqualified Authority

- **Appeal to Unqualified Authority (Argumentum ad Verecundiam)**
An arguer cited an authority or a witness who lacks credibility.

Dr. Bradshaw, our family physician, has stated that the creation of muonic atoms of deuterium and tritium hold the key to producing a sustained nuclear fusion reaction at room temperature. In view of Dr. Bradshaw's expertise as a physician, we must conclude that this is indeed true.

James W. Johnston, Chairman of R. J. Reynolds Tobacco Company, testified before Congress that tobacco is not an addictive substance and that smoking cigarettes does not produce any addiction. Therefore, we should believe him and conclude that smoking does not in fact lead to any addiction.

2.2 Appeal to Ignorance

- **Appeal to Ignorance (Argumentum ad Ignorantiam)**

Using the premises that have not been known to be true or not to make a conclusion.

People have been trying for centuries to provide conclusive evidence for the claims of astrology, and no one has ever succeeded. Therefore, we must conclude that astrology is a lot of nonsense.

People have been trying for centuries to disprove the claims of astrology, and no one has ever succeeded. Therefore, we must conclude that the claims of astrology are true.

2.3 Hasty Generalization

- **Hasty Generalization (Converse Accident)**

Making a generalized statement from insufficient or non-representative evidence or data.

Today's money managers are a pack of thieves, every last one of them. Look at Bernie Madoff and Robert Allen Stanford. They ripped off billions of dollars from thousands of trusting clients. And Raj Rajaratnam profited to the tune of millions of dollars through illegal insider trading.

Before the last presidential election, three residents of Harlem were quoted as saying they supported Barack Obama even though they knew nothing about his policies. Obviously, the policies played no role in the outcome of that election.

2.4 False Cause

- **False Cause**

The link between premises and conclusion depends on some imagined causal connection that probably does not exist.

post hoc ergo propter hoc (“after this, therefore on account of this”)

During the past two months, every time that the cheerleaders have worn blue ribbons in their hair, the basketball team has been defeated. Therefore, to prevent defeats in the future, the cheerleaders should get rid of those blue ribbons.



MAY 1, 2011
Ramsey Scored Against
Man-U....
Bin Laden Dead Next Day



October 2, 2011
Ramsey Scored Against
Spurs.....
4 Days Later **Steve Jobs**
Dead



October 19, 2011
Ramsey Scored Against
Marseille.....
Gadadafi Dead Next Day



February 11, 2012
Ramsey Scored Against
Sunderland.....
Whitney Houston Dead
Next Day



May 14, 2013
Ramsey Scored Against
Wigan.....
Ferguson, Beckham,
Bommel, Caragher,
Scholes, Ballack,
Hiddink and Owen
retired from Football.



2.4 False Cause

non causa pro causa (“not the cause for the cause”)

Successful business executives are paid salaries in excess of \$100,000.
Therefore, the best way to ensure that Ferguson will become a successful executive is to raise his salary to at least \$100,000.

Oversimplified cause (Arguer only selects one of many causes to conclude that it is the only or main cause)

The quality of education in our grade schools and high schools has been declining for years. Clearly, our teachers just aren't doing their job these days.

2.4 False Cause

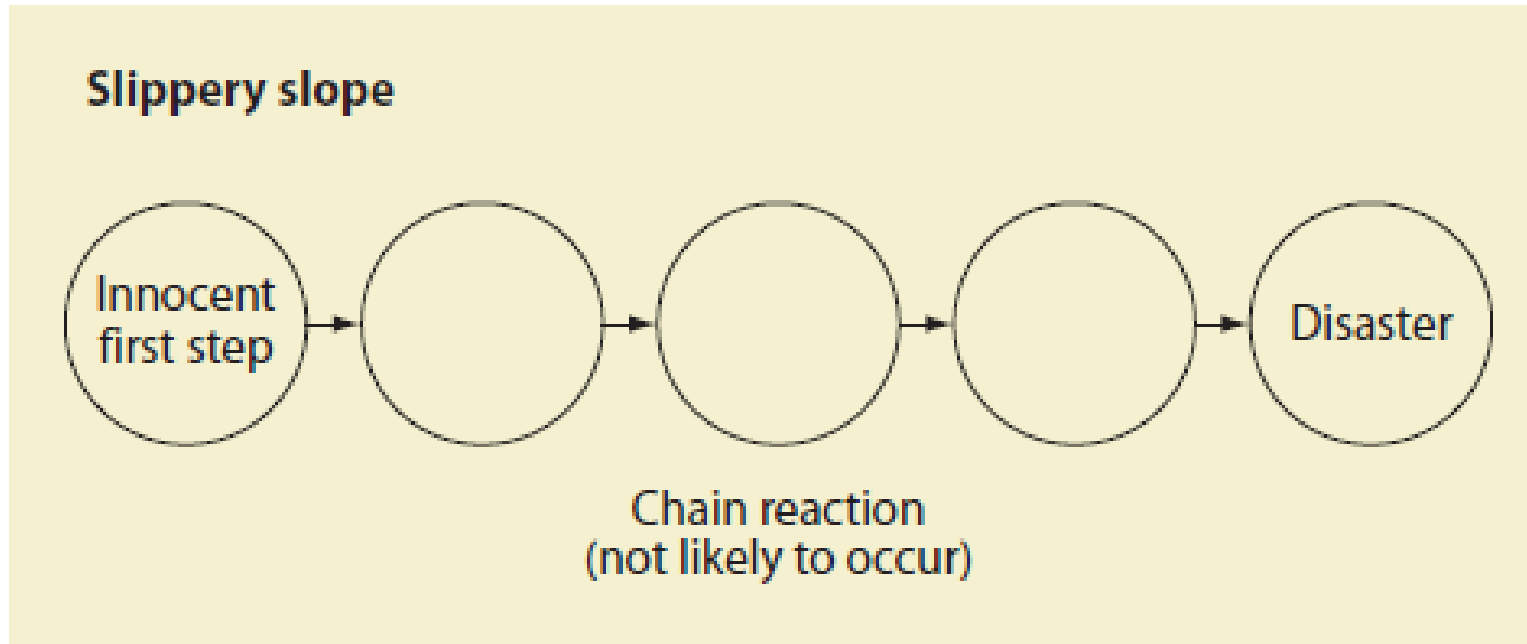
Gambler's fallacy: The conclusion depends on the supposition that independent events in a game of chance are causally related.

A fair coin was flipped five times in a row, and each time it came up heads. Therefore, on the next flip, the coin is more likely to come up tails than heads.

2.5 Slippery Slope

- **Slippery Slope**

The conclusion rests on an alleged chain reaction and there is not sufficient reason to think that the chain reaction will actually take place.



2.5 Slippery Slope

Immediate steps should be taken to outlaw pornography once and for all. The continued manufacture and sale of pornographic material will almost certainly lead to an increase in sex-related crimes such as rape and incest. This in turn will gradually erode the moral fabric of society and result in an increase in crimes of all sorts. Eventually a complete disintegration of law and order will occur, leading in the end to the total collapse of civilization.

Attempts to outlaw pornography threaten basic civil rights and should be summarily abandoned. If pornography is outlawed, censorship of newspapers and news magazines is only a short step away. After that there will be censorship of textbooks, political speeches, and the content of lectures delivered by university professors. Complete mind control by the central government will be the inevitable result.

2.6 Weak Analogy

- **Weak analogy**

The conclusion depends on the existence of an analogy, or similarity, between two things or situations, but the analogy or similarity is not strong enough to support the conclusion.

- Basic structure of an argument from analogy:

Entity A has attributes a, b, c, and z.

Entity B has attributes a, b, c.

Therefore, entity B probably has attribute z also.

2.6 Weak Analogy

Amber's dog is similar in many ways to Kyle's cat. Both like being petted, they enjoy being around people, they beg for food at the dinner table, and they sleep with their owners. Amber's dog loves to romp on the beach with Amber. Therefore, Kyle's cat probably loves to romp on the beach with Kyle.

The flow of electricity through a wire is similar to the flow of water through a pipe. When water runs downhill through a pipe, the pressure at the bottom of the hill is greater than it is at the top. Thus, when electricity flows downhill through a wire, the voltage should be greater at the bottom of the hill than at the top.

3. Fallacies of Presumption

The premises presume what they purport to prove

3.1 Begging the Question

- **Begging the Question (Petitio Principii)**

Arguer creates the illusion that inadequate premises provide adequate support for the conclusion by leaving out a possibly false (shaky) key premise, by restating a possibly false premise as the conclusion, or by reasoning in a circle.

Murder is morally wrong. This being the case, it follows that abortion is morally wrong.

We know that humans are intended to eat lots of fruit because the human hand and arm are perfectly suited for picking fruit from a tree.

Clearly, terminally ill patients have a right to doctor-assisted suicide. After all, many of these people are unable to commit suicide by themselves.

3.1 Begging the Question

Capital punishment is justified for the crimes of murder and kidnapping because it is quite legitimate and appropriate that someone be put to death for having committed such hateful and inhuman acts.

Verizon has the best cell phone service. After all, their phones have the clearest sound. And we know this is so because customers hear better on Verizon phones. And this follows from the fact that Verizon has digital technology. But this is exactly what you would expect given that Verizon has the best cell phone service.

3.2 Complex Question

- **Complex question**

Two (or more) questions are asked in the guise of a single question and a single answer is then given to both of them.

Have you stopped cheating on exams?

Where did you hide the marijuana you were smoking?

3.3 False Dichotomy

- **Complex question**

A disjunctive (“either . . . or . . .”) premise presents two unlikely alternatives as if they were the only ones available, and the arguer then eliminates the undesirable alternative, leaving the desirable one as the conclusion.

Either you let me attend the Dixie Chicks concert or I’ll be miserable for the rest of my life. I know you don’t want me to be miserable for the rest of my life, so it follows that you’ll let me attend the concert.

Either you use Ultra Guard deodorant or you risk the chance of perspiration odor. Surely you don’t want to risk the chance of perspiration odor. Therefore, you will want to use Ultra Guard deodorant.

3.4 Suppressed Evidence

- **Suppressed evidence**

Some strong evidence against the claim is suppressed or omitted.

Most dogs are friendly and pose no threat to people who pet them. Therefore, it would be safe to pet the little dog that is approaching us now.

During the past sixty years, Poland has enjoyed a rather low standard of living. Therefore, Poland will probably have a low standard of living for the next sixty years.

3.4 Suppressed Evidence

The Second Amendment to the Constitution states that the right of the people to keep and bear arms shall not be infringed. But a law controlling handguns would infringe the right to keep and bear arms. Therefore, a law controlling handguns would be unconstitutional.

The Second Amendment reads, "A well regulated militia being necessary to the security of a free state, the right of the people to keep and bear arms shall not be infringed."

4. Fallacies of Ambiguity

Fallacies caused by ambiguities in the premises or in the conclusion (or both)

4.1 Equivocation

- **Equivocation**

The conclusion depends on the fact that a word or phrase is used, either explicitly or implicitly, in two different senses in the argument.

Any law can be repealed by the legislative authority. But the law of gravity is a law. Therefore, the law of gravity can be repealed by the legislative authority.

Some triangles are obtuse. Whatever is obtuse is ignorant. Therefore, some triangles are ignorant.

A mouse is an animal. Therefore, a large mouse is a large animal.

4.2 Amphiboly

- **Amphiboly**

Arguer misinterprets an ambiguous statement and then draws a conclusion based on this faulty interpretation.

The tour guide said that standing in Greenwich Village, the Empire State Building could easily be seen. It follows that the Empire State Building is in Greenwich Village.

John told Henry that he had made a mistake. It follows that John has at least the courage to admit his own mistakes.

Professor Johnson said that he will give a lecture about heart failure in the biology lecture hall. It must be the case that a number of heart failures have occurred there recently.

5. Fallacies of Grammatical Analogy

A bad argument that is similar in grammatical form to a good argument.

5.1 Composition

- **Composition**

The conclusion depends on the erroneous transference of an attribute from the parts of something onto the whole.

The Brooklyn Bridge is made of steel.

Steel is heavy.

Therefore, the Brooklyn Bridge is heavy.

The Brooklyn Bridge is made of atoms.

Atoms are invisible.

Therefore, the Brooklyn Bridge is invisible.

5.1 Composition

Maria likes anchovies. She also likes chocolate ice cream. Therefore, it is certain that she would like a chocolate sundae topped with anchovies.

Each player on this basketball team is an excellent athlete. Therefore, the team as a whole is excellent.

5.2 Division

- **Division**

The conclusion depends on the erroneous transference of an attribute from a whole (or a class) onto its parts (or members).

The students in this class are 18 years old. Thompson is a member of this class. Therefore, Thompson is 18 years old.

The Royal Society is over 300 years old. Thompson is a member of the Royal Society. Therefore, Thompson is over 300 years old.

5.2 Division

Ford Model T have almost disappeared. This car is a Ford Model T.
Therefore, this car has almost disappeared.

The average American family has 2.5 children.
The Jones family is an average American family.
Therefore, the Jones family has 2.5 children.