Stephen's Guide to the Logical Fallacies

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OVERVIEW

The point of an argument is to give reasons in support of some conclusion. An argument commits a fallacy when the reasons offered do not, in fact, support the conclusion. Each fallacy is described in the following format:

Name: this is the generally accepted name of the fallacy

Definition: the fallacy is defined

Examples: examples of the fallacy are given

Proof: the steps needed to prove that the fallacy is committed

Note: Please keep in mind that this is a work in progress, and therefore should not be thought of as complete in any way.

FALLACIES OF DISTRACTION

Each of these fallacies is characterized by the illegitimate use of a logical operator in order to distract the reader from the apparent falsity of a certain proposition.

False Dilemma

Definition: A limited number of options (usually two) is given, while in reality there are more options. A false dilemma is an illegitimate use of the "or" operator.
Examples: (i) Either you're for me or against me.
(ii) America: love it or leave it.
(iii) Either support Meech Lake or Quebec will separate.
Proof: Identify the options given and show (with an example) that there is an additional option. (Cedarblom and Paulsen: 136)

Argument From Ignorance(argumentum ad ignorantiam)

Definition: Arguments of this form assume that since something has not been proven false, it is therefore true. Conversely, such an argument may assume that since something has not been proven true, it is therefore false. (This is a special case of a false dilemma, since it assumes that all propositions must either be known to be true or known to be false.) As Davis writes, "Lack of proof is not proof." (p. 59)
Examples: (i) Since you cannot prove that ghosts do not exist, they must exist.
(ii) Since scientists cannot prove that global warming will occur, it probably won't.
(iii) Fred said that he is smarter than Jill, but he didn't prove it, so it must be false.
Proof: Identify the proposition in question. Argue that it may be true even though we don't know whether it is or isn't. (Copi and Cohen: 93, Davis: 59)

Slippery Slope

Definition: In order to show that a proposition P is unacceptable, a sequence of increasingly unacceptable events is shown to follow from P. A slippery slope is an illegitimate use of the "if-then" operator.
Examples: (i) If we pass laws against fully-automatic weapons, then it won't be long before we pass laws on all weapons, and then we will begin to restrict other rights, and finally we will end up living in a communist state. Thus, we should not ban fully-automatic weapons.
(ii) You should never gamble. Once you start gambling you find it hard to stop. Soon you are spending all your money on gambling, and eventually you will turn to crime to support your earnings.
(iii) If I make an exception for you then I have to make an exception for everyone.

Proof: Identify the proposition P being refuted and identify the final event in the series of events. Then show that this final event need not occur as a consequence of P. (Cedarblom and Paulsen: 137)

Complex Question

Definition: Two otherwise unrelated points are conjoined and treated as a single proposition. The reader is expected to accept or reject both together, when in reality one is acceptable while the other is not. A complex question is an illegitimate use of the "and" operator.
Examples: (i) You should support home education and the God-given right of parents to raise their children according to their own beliefs.
(ii) Do you support freedom and the right to bear arms?
(iii) Have you stopped using illegal sales practises? (This asks two questions: did you use illegal practises, and did you stop?)
Proof: Identify the two propositions illegitimately conjoined and show that believing one does not mean that you have to believe the other. (Cedarblom and Paulsen: 86, Copi and Cohen: 96)

APPEALS TO MOTIVES IN PLACE OF SUPPORT

The fallacies in this section have in common the practise of appealing to emotions or other psychological factors. In this way, they do not provide reasons for belief.

Appeal to Force (argumentum ad baculum)

Definition: The reader is told that unpleasant consequences will follow if they do not agree with the author.
Examples: (i) You had better agree that the new company policy is the best bet if you expect to keep your job.
(ii) NAFTA is wrong, and if you don't vote against NAFTA then we will vote you out of office.
Proof: Identify the threat and the proposition and argue that the threat is unrelated to the truth or falsity of the proposition. (Cedarblom and Paulsen: 151, Copi and Cohen: 103)

Appeal to Pity(argumentum ad misercordiam)

Definition: The reader is told to agree to the proposition because of the pitiful state of the author.
Examples: (i) How can you say that's out? It was so close, and besides, I'm down ten games to two.
(ii) We hope you'll accept our recommendations. We spent the last three months working extra time on it.
Proof: Identify the proposition and the appeal to pity and argue that the pitiful state of the arguer has nothing to do with the truth of the proposition. (Cedarblom and Paulsen: 151, Copi and Cohen: 103, Davis: 82)

Appeal to Consequences(argumentum ad consequentiam)

Definition: The author points to the disagreeable consequences of holding a particular belief in order to show that this belief is false. Example: (i) You can't agree that evolution is true, because if it were, then we would be no better than monkeys and apes.
(ii) You must believe in God, for otherwise life would have no meaning. (Perhaps, but it is equally possible that since life has no meaning that God does not exist.)
Proof: Identify the consequences to and argue that what we want to be the case does not affect what is in fact the case. (Cedarblom and Paulsen: 100, Davis: 63)

Prejudicial Language

Definition: Loaded or emotive terms are used to attach value or moral goodness to believing the proposition.
Examples: (i) Right thinking Canadians will agree with me that we should have another free vote on capital punishment.
(ii) A reasonable person would agree that our income statement is too low.
(iii) Senator Turner claims that the new tax rate will reduce the deficit. (Here, the use of "claims" implies that what Turner says is false.)
(iv) The proposal is likely to be resisted by the bureaucrats on Parliament Hill. (Compare this to: The proposal is likely to be rejected by officials on Parliament Hill.)

Proof: Identify the prejudicial terms used (eg. "Right thinking Canadians" or "A reasonable person"). Show that disagreeing with the conclusion does not make a person "wrong thinking" or "unreasonable". (Cedarblom and Paulsen: 153, Davis: 62)

Appeal to Popularity(argumentum ad populum)

Definition: A proposition is held to be true because it is widely held to be true or is held to be true by some (usually upper crust) sector of the population. This fallacy is sometimes also called the "Appeal to Emotion" because emotional appeals often sway the population as a whole.
Examples: (i) If you were beautiful, you could live like this, so buy Buty-EZ and become beautiful. (Here, the appeal is to the "beautiful people".)
(ii) Polls suggest that the Liberals will form a majority government, so you may as well vote for them.
(iii) Everyone knows that the Earth is flat, so why do you persist in your outlandish claims? (Copi and Cohen: 103, Davis: 62)

CHANGING THE SUBJECT

The fallacies in this section change the subject by discussing the person making the argument instead of discussing reasons to believe or disbelieve the conclusion. While on some occasions it is useful to cite authorities, it is almost never appropriate to discuss the person instead of the argument.

Attacking the Person (argumentum ad hominem)

Definition: The person presenting an argument is attacked instead of the argument itself. This takes many forms. For example, the person's character, nationality or religion may be attacked. Alternatively, it may be pointed out that a person stands to gain from a favourable outcome. Or, finally, a person may be attacked by association, or by the company he keeps. There are three major forms of Attacking the Person: (1) ad hominem (abusive): instead of attacking an assertion, the argument attacks the person who made the assertion. (2) ad hominem (circumstantial): instead of attacking an assertion the author points to the relationship between the person making the assertion and the person's circumstances. (3) ad hominem (tu quoque): this form of attack on the person notes that a person does not practise what he preaches.
Examples: (i) You may argue that God doesn't exist, but you are just following a fad. (ad hominem abusive)
(ii) We should discount what Premier Klein says about taxation because he won't be hurt by the increase. (ad hominem circumstantial)
(iii) We should disregard Share B.C.'s argument because they are being funded by the logging industry. (ad hominem circumstantial)
(iv) You say I shouldn't drink, but you haven't been sober for more than a year. (ad hominem tu quoque)
Proof: Identify the attack and show that the character or circumstances of the person has nothing to do with the truth or falsity of the proposition being defended. (Barker: 166, Cedarblom and Paulsen: 155, Copi and Cohen: 97, Davis: 80)

Appeal to Authority(argumentum ad verecundiam)

Definition: While sometimes it may be appropriate to cite an authority to support a point, often it is not. In particular, an appeal to authority is inappropriate if: (i) the person is not qualified to have an expert opinion on the subject,
(ii) experts in the field disagree on this issue.
(iii) the authority was making a joke, drunk, or otherwise not being serious A variation of the fallacious appeal to authority is hearsay. An argument from hearsay is an argument which depends on second or third hand sources.
Examples: (i) Noted psychologist Dr. Frasier Crane recommends that you buy the EZ-Rest Hot Tub.
(ii) Economist John Kenneth Galbraith argues that a tight money policy s the best cure for a recession. (Although Galbraith is an expert, not all economists agree on this point.)
(iii) We are headed for nuclear war. Last week Ronald Reagan remarked that we begin bombing Russia in five minutes. (Of course, he said it as a joke during a microphone test.)
(iv) My friend heard on the news the other day that Canada will declare war on Serbia. (This is a case of hearsay; in fact, the reporter said that Canada would not declare war.)

(v) The Ottawa Citizen reported that sales were up 5.9 percent this year. (This is hearsay; we are not n a position to check the Citizen's sources.)
Proof: Show that either (i) the person cited is not an authority in the field, or that
(ii) there is general disagreement among the experts in the field on this point. (Cedarblom and Paulsen: 155, Copi and Cohen: 95, Davis: 69)

Anonymous Authorities

Definition: The authority in question is not named. This is a type of appeal to authority because when an authority is not named it is impossible to confirm that the authority is an expert. However the fallacy is so common it deserves special mention. A variation on this fallacy is the appeal to rumour. Because the source of a rumour is typically not known, it is not possible to determine whether to believe the rumour. Very often false and harmful rumours are deliberately started n order to discredit an opponent.
Examples: (i) A government official said today that the new gun law will be proposed tomorrow.
(ii) Experts agree that the best way to prevent nuclear war is to prepare for it.
(iii) It is held that there are more than two million needless operations conducted every year.
(iv) Rumour has it that the Prime Minster will declare another holiday in October.
Proof: Argue that because we don't know the source of the information we have no way to evaluate the reliability of the information. (Davis: 73)

Style Over Substance

Definition: The manner in which an argument (or arguer) is presented is taken to affect the likelihood that the conclusion is true.
Examples: (i) Nixon lost the presidential debate because of the sweat on his forehead.
(ii) Trudeau knows how to move a crowd. He must be right.
(iii) Why don't you take the advice of that nicely dressed young man?
Proof: While it is true that the manner in which an argument is presented will affect whether people believe that its conclusion is true, nonetheless, the truth of the conclusion does not depend on the manner in which the argument is presented. In order to show that this fallacy is being committed, show that the style in this case does not affect the truth or falsity of the conclusion. (Davis: 61)

INDUCTIVE FALLACIES

Inductive reasoning consists on inferring from the properties of a sample to the properties of a population as a whole. For example, suppose we have a barrel containing of 1,000 beans. Some of the beans are black and some of the beans are white. Suppose now we take a sample of 100 beans from the barrel and that 50 of them are white and 50 of them are black. Then we could infer inductively that half the beans in the barrel (that is, 500 of them) are black and half are white. All inductive reasoning depends on the similarity of the sample and the population. The more similar the same is to the population as a whole, the more reliable will be the inductive inference. On the other hand, if the sample is relevantly dissimilar to the population, then the inductive inference will be unreliable. No inductive inference is perfect. That means that any inductive inference can sometimes fail. Even though the premises are true, the conclusion might be false. Nonetheless, a good inductive inference gives us a reason to believe that the conclusion is probably true.

Hasty Generalization

Definition: The size of the sample is too small to support the conclusion.
Examples: (i) Fred, the Australian, stole my wallet. Thus, all Australians are thieves. (Of course, we shouldn't judge all Australians on the basis of one example.)
(ii) I asked six of my friends what they thought of the new spending restraints and they agreed it is a good idea. The new restraints are therefore generally popular.
Proof: Identify the size of the sample and the size of the population, then show that the sample size is too small.
Note: a formal proof would require a mathematical calculation. This is the subject of probability theory. For now, you must rely on common sense. (Barker: 189, Cedarblom and Paulsen: 372, Davis: 103)

Unrepresentative Sample

Definition: The sample used in an inductive inference is relevantly different from the population as a whole.
Examples: (i) To see how Canadians will vote in the next election we polled a hundred people in Calgary. This shows conclusively that the Reform Party will sweep the polls. (People in Calgary tend to be more conservative, and hence more likely to vote Reform, than people in the rest of the country.)
(ii) The apples on the top of the box look good. The entire box of apples must be good. (Of course, the rotten apples are hidden beneath the surface.)
Proof: Show how the sample is relevantly different from the population as a whole, then show that because the sample is different, the conclusion is probably different. (Barker: 188, Cedarblom and Paulsen: 226, Davis: 106)

False Analogy

Definition: In an analogy, two objects (or events), A and B are shown to be similar. Then it is argued that since A has property P, so also B must have property P. An analogy fails when the two objects, A and B, are different in a way which affects whether they both have property P.
Examples: (i) Employees are like nails. Just as nails must be hit in the head in order to make them work, so must employees.
(ii) Government is like business, so just as business must be sensitive primarily to the bottom line, so also must government. (But the objectives of government and business are completely different, so probably they will have to meet different criteria.)
Proof: Identify the two objects or events being compared and the property which both are said to possess. Show that the two objects are different in a way which will affect whether they both have that property. (Barker: 192, Cedarblom and Paulsen: 257, Davis: 84)

Slothful Induction

Definition: The proper conclusion of an inductive argument is denied despite the evidence to the contrary.
Examples: (i) Hugo has had twelve accidents n the last six months, yet he insists that it is just a coincidence and not his fault. (Inductively, the evidence is overwhelming that it is his fault. This example borrowed from Barker, p. 189)
(ii) Poll after poll shows that the N.D.P will win fewer than ten seats in Parliament. Yet the party leader insists that the party is doing much better than the polls suggest. (The N.D.P. in fact got nine seats.)
Proof: About all you can do in such a case is to point to the strength of the inference. (Barker: 189)

Fallacy of Exclusion

Definition: Important evidence which would undermine an inductive argument is excluded from consideration. The requirement that all relevant information be included is called the "principle of total evidence".
Examples: (i) Jones is Albertan, and most Albertans vote Tory, so Jones will probably vote Tory. (The information left out is that Jones lives in Edmonton, and that most people in Edmonton vote Liberal or N.D.P.)
(ii) The Leafs will probably win this game because they've won nine out of their last ten. (Eight of the Leafs' wins came over last place teams, and today they are playing the first place team.)
Proof: Give the missing evidence and show that it changes the outcome of the inductive argument. Note that it is not sufficient simply to show that not all of the evidence was included; it must be shown that the missing evidence will change the conclusion. (Davis: 115)

FALLACIES INVOLVING STATISTICAL SYLLOGISMS

A statistical generalization is a statement which is usually true, but not always true. Very often these are expressed using the word "most", as in "Most conservatives favour welfare cuts." Sometimes the word "generally" s used, as in "Conservatives generally favour welfare cuts." Or, sometimes, no specific word is used at all, as in: "Conservatives favour welfare cuts." Fallacies involving statistical generalizations occur because the generalization is not always true. Thus, when an author treats a statistical generalization as though it were always true, the author commits a fallacy.

Accident

Definition: A general rule is applied when circumstances suggest that an exception to the rule should apply.

Examples: (i) The law says that you should not travel faster than 50 kph, thus even though your father could not breathe, you should not have travelled faster than 50 kph.
(ii) It is good to return things you have borrowed. Therefore, you should return this automatic rifle from the madman you borrowed it from. (Adapted from Plato's Republic, Book I).
Proof: Identify the generalization in question and show that it s not a universal generalization. Then show that the circumstances of this case suggest that the generalization ought not to apply. (Copi and Cohen: 100)

Converse Accident

Definition: An exception to a generalization is applied to cases where the generalization should apply.
Examples: (i) Because we allow terminally ill patients to use heroin, we should allow everyone to use heroin.
(ii) Because you allowed Jill, who was hit by a truck, to hand in her assignment late, you should allow the entire class to hand in their assignments late.
Proof: Identify the generalization in question and show how the special case was an exception to the generalization. (Copi and Cohen: 100)

CAUSAL FALLACIES

It is common for arguments to conclude that one thing causes another. But the relation between cause and effect is a complex one. It is easy to make a mistake. In general, we say that a cause C is the cause of an effect E if and only if:
(i) Generally, if C occurs, then E will occur, and (ii) Generally, if C does not occur, then E will not occur ether. We say "generally" because there are always exceptions. For example: We say that striking the match causes the match to light, because: (i) Generally, when the match is struck, it lights (except when the match is dunked in water), and (ii) Generally, when the match is not struck, it does not light (except when it is lit with a blowtorch). Many writers also require that a causal statement be supported with a natural law. For example, the statement that "striking the match causes it to light" is supported by the principle that "friction produces heat, and heat produces fire".

Coincidental Correlation (post hoc ergo prompter hoc)

Definition: The name in Latin means "after this therefore because of this". This describes the fallacy. An author commits the fallacy when it is assumed that because one thing follows another that the one thing was caused by the other.
Examples: (i) Immigration to Alberta from Ontario increased. Soon after, the welfare rolls increased. Therefore, the increased immigration caused the increased welfare rolls.
(ii) I took EZ-No-Cold, and two days later, my cold disappeared.
Proof: Show that the correlation is coincidental by showing that: (i) the effect would have occurred even if the cause did not occur, or
(ii) that the effect was caused by something other than the suggested cause. (Cedarblom and Paulsen: 237, Copi and Cohen: 101)

Joint Effect

Definition: One thing is held to cause another when in fact both are the effect of a single underlying cause. This fallacy is often understood as a special case of post hoc ergo prompter hoc.
Examples: (i) We are experiencing high unemployment which s being caused by a low consumer demand. (In fact, both may be caused by high interest rates.)
(ii) You have a fever and this is causing you to break out in spots. (In fact, both symptoms are caused by the measles.)
Proof: Identify the two effects and show that they are caused by the same underlying cause. It is necessary to describe the underlying cause and prove that it causes each symptom. (Cedarblom and Paulsen: 238)

Genuine but Insignificant Cause

Definition: The object or event identified as the cause of an effect is a genuine cause, but insignificant when compared to the other causes of that event. Note that this fallacy does not apply when all other contributing causes are equally insignificant. Thus, it is not a fallacy to say that you helped cause defeat the Tory government because you voted Reform, for your vote had as much weight as any other vote, and hence is equally a part of the cause.

Examples: (i) Smoking is causing air pollution in Edmonton. (True, but the effect of smoking is insignificant compared to the effect of auto exhaust.)
(ii) By leaving your oven on overnight you are contributing to global warming.
Proof: Identify the much more significant cause. (Cedarblom and Paulsen: 238)

Wrong Direction

Definition: The relation between cause and effect is reversed.
Examples: (i) Cancer causes smoking.
(ii) The increase in AIDS was caused by more sex education. (In fact, the increase in sex education was caused by the spread of AIDS.)
Proof: Give a causal argument showing that the relation between cause and effect has been reversed. (Cedarblom and Paulsen: 238)

Complex Cause

Definition: The effect is caused by a number of objects or events, of which the cause identified is only a part. A variation of this is the feedback loop where the effect is itself a part of the cause.
Examples: (i) The accident was caused by the poor location of the bush. (True, but it wouldn't have occurred had the driver not been drunk and the pedestrian not been jaywalking.)
(ii) The Challenger explosion was caused by the cold weather. (True, however, it would not have occurred had the O-rings been properly constructed.)
(iii) People are in fear because of increased crime. (True, but this has lead people to break the law as a consequence of their fear, which increases crime even more.)
Proof: Show that all of the causes, and not just the one mentioned, are required to produce the effect.)Cedarblom and Paulsen: 238)

MISSING THE POINT

These fallacies have in common a general failure to prove that the conclusion is true.

Begging the Question (petitio principii)

Definition: The truth of the conclusion is assumed by the premises. Often, the conclusion is simply restated in the premises in a slightly different form. In more difficult cases, the premise is a consequence of the conclusion.
Examples: (i) Since I'm not lying, it follows that I'm telling the truth.
(ii) We know that God exists, since the Bible says God exists. What the Bible says must be true, since God wrote it and God never lies. (Here, we must agree that God exists in order to believe that God wrote the Bible.)
Proof: Show that in order to believe that the premises are true we must already agree that the conclusion is true. (Barker: 159, Cedarblom and Paulsen: 144, Copi and Cohen: 102, Davis: 33)

Irrelevant Conclusion (ignoratio elenchi)

Definition: An argument which purports to prove one thing instead proves a different conclusion.
Examples: (i) You should support the new housing bill. We can't continue to see people living in the streets; we must have cheaper housing. (We may agree that housing s important even though we disagree with the housing bill.)
(ii) I say we should support affirmative action. White males have run the country for 500 years. They run most of government and industry today. You can't deny that this sort of discrimination is intolerable. (The author has proven that there is discrimination, but not that affirmative action will end that discrimination.)
Proof: Show that the conclusion proved by the author is not the conclusion that the author set out to prove. (Copi and Cohen: 105)

Straw Man

Definition: The author attacks an argument which is different from, and usually weaker than, the opposition's best argument.
Examples: (i) People who opposed the Charlottown Accord probably just wanted Quebec to separate. But we want Quebec to stay in Canada.

(ii) We should have conscription. People don't want to enter the military because they find it an inconvenience. But they should realize that there are more important things than convenience.
Proof: Show that the opposition's argument has been misrepresented by showing that the opposition has a stronger argument. Describe the stronger argument. (Cedarblom and Paulsen: 138)

FALLACIES OF AMBIGUITY

The fallacies in this section are all cases where a word or phrase is used unclearly. There are two ways in which this can occur. (i) The word or phrase may be ambiguous, in which case it has more than one distinct meaning. (ii) The word or phrase may be vague, in which case it has no distinct meaning.

Equivocation

Definition: The same word is used with two different meanings.
Examples: (i) Criminal actions are illegal, and all murder trials are criminal actions, thus all murder trials are illegal. (Here the term "criminal actions" is used with two different meanings. Example borrowed from Copi.)
(ii) The sign said "fine for parking here", and since it was fine, I parked there.
(iii) All child-murderers are inhuman, thus, no child- murderer is human. (From Barker, p. 164; this is called "illicit obversion")
(iv) A plane is a carpenter's tool, and the Boeing 737 is a plane, hence the Boeing 737 is a carpenter's tool. (Example borrowed from Davis, p. 58)
Proof: Identify the word which is used twice, then show that a definition which is appropriate for one use of the word would not be appropriate for the second use. (Barker: 163, Cedarblom and Paulsen: 142, Copi and Cohen: 113, Davis: 58)

Amphiboly

Definition: An amphiboly occurs when the construction of a sentence allows it to have two different meanings.
Examples: (i) Last night I shot a burglar in my pajamas.
(ii) The Oracle of Delphi told Croseus that if he pursued the war he would destroy a mighty kingdom. (What the Oracle did not mention was that the kingdom he destroyed would be his own. Adapted from Heroditus, The Histories.)
(iii) Save soap and waste paper. (From Copi, p. 115)
Proof: Identify the ambiguous phrase and show the two possible interpretations. (Copi and Cohen: 114)

Accent

Definition: Emphasis is used to suggest a meaning different from the actual content of the proposition.
Examples: (i) It would be illegal to give away Free Beer!
(ii) The first mate, seeking revenge on the captain, wrote in his journal, "The Captain was sober today." (He suggests, by his emphasis, that the Captain is usually drunk. From Copi, p. 117) (Copi and Cohen: 115)

CATEGORY ERRORS

These fallacies occur because the author mistakenly assumes that the whole is nothing more than the sum of its parts. However, things joined together may have different properties as a whole than any of them do separately.

Composition Definition

Definition: Because the parts of a whole have a certain property, it is argued that the whole has that property. That whole may be either an object composed of different parts, or it may be a collection or set of individual members.
Examples: (i) The brick wall is six feet tall. Thus, the bricks in the wall are six feet tall.
(ii) Germany is a militant country. Thus, each German is militant.
(iii) Conventional bombs did more damage in W.W. II than nuclear bombs. Thus, a conventional bomb is more dangerous than a nuclear bomb. (From Copi, p. 118)

Proof: Show that the properties in question are the properties of the whole, and not of each part or member or the whole. If necessary, describe the parts to show that they could not have the properties of the whole. (Barker: 164, Copi and Cohen: 117)

Division

Definition: Because the whole has a certain property, it is argued that the parts have that property. The whole in question may be either a whole object or a collection or set of individual members.
Examples: (i) Each brick is three inches high, thus, the brick wall is three inches high.
(ii) Because the brain is capable of consciousness, each neural cell in the brain must be capable of consciousness.
Proof: Show that the properties in question are the properties of the parts, and not of the whole. If necessary, describe the parts to show that they could not have the properties of the whole. (Barker: 164, Copi and Cohen: 119)

NON-SEQUITUR

The term non sequitur literally means "it does not follow". In this section we describe fallacies which occur as a consequence of invalid arguments.

Affirming the Consequent

Definition: Any argument of the following form is invalid: If A then B B Therefore, A
Examples: (i) If I am in Calgary, then I am in Alberta. I am in Alberta, thus, I am in Calgary. (Of course, even though the premises are true, I might be in Edmonton, Alberta.)
(ii) If the mill were polluting the river then we would see an increase in fish deaths. And fish deaths have increased. Thus, the mill is polluting the river.
Proof: Show that even though the premises are true, the conclusion could be false. In general, show that B might be a consequence of something other than A. For example, the fish deaths might be caused by pesticide run-off, and not the mill. (Barker: 69, Cedarblom and Paulsen: 24, Copi and Cohen: 241)

Denying the Antecedent

Definition: Any argument of the following form is invalid: If A then B Not A Therefore, Not B
Examples: (i) If you get hit by a car when you are six then you will die young. But you were not hit by a car when you were six. Thus you will not die young. (Of course, you could be hit by a train at age seven.)
(ii) If I am in Calgary then I am in Alberta. I am not in Calgary, thus, I am not in Alberta.
Proof: Show that even though the premises are true, the conclusion may be false. In particular, show that the consequence B may occur even though A does not occur. (Barker: 69, Cedarblom and Paulsen: 26, Copi and Cohen: 241)

Inconsistency

Definition: The author asserts more than one proposition such that the propositions cannot all be true. In such a case, the propositions may be contradictories or they may be contraries.
Examples: (i) Montreal is about 200 km from Ottawa, while Toronto is 400 km from Ottawa. Toronto is closer to Ottawa than Montreal.
(ii) John is taller than Jake, and Jake is taller than Fred, while Fred is taller than John.
Proof: Assume that one of the statements is true, and then use it as a premise to show that one of the other statements is false. (Barker: 157)