

DEDUCTIVE ARGUMENTS

created by Drew Schroeder, October 2005 (rev. 2007)

Any set of premises and a conclusion which is supposed to follow from them is called an **argument**. A **deductive argument** is one where the premises are supposed to logically entail the conclusion. That is, it isn't possible for the premises to be true but the conclusion false. Here is Aristotle's famous example of a good deductive argument:

1	<ol style="list-style-type: none"> 1. All men are mortal. 2. Socrates is a man. <hr/> <ol style="list-style-type: none"> 3. Socrates is mortal.
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Most of the arguments we use in everyday life are inductive. **Inductive arguments** are those whose premises make their conclusion more reasonable to believe, though they don't guarantee it. Here are two examples:

2	<ol style="list-style-type: none"> 1. No baseball team has lost 150 games in a season. 2. The Yankees are a baseball team. <hr/> <ol style="list-style-type: none"> 3. The Yankees won't lose 150 games this season. 	3	<ol style="list-style-type: none"> 1. Jones was murdered yesterday. 2. Smith was the only one near Jones yesterday. <hr/> <ol style="list-style-type: none"> 3. Smith murdered Jones.
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Deductive arguments are much simpler to analyze. An argument is **valid** (or, **deductively valid**) when the conclusion really does follow logically from the premises -- that is, when it isn't possible for the premises to be true but the conclusion false. Argument 1, above, is valid, as are these three arguments:

4	<ol style="list-style-type: none"> 1. Either God exists or pigs fly. 2. Pigs don't fly. <hr/> <ol style="list-style-type: none"> 3. God exists. 	5	<ol style="list-style-type: none"> 1. Shakespeare wrote <i>Hamlet</i>. 2. Aaron Sorkin wrote <i>The West Wing</i>. <hr/> <ol style="list-style-type: none"> 3. Fermat's last theorem is true. 	6	<ol style="list-style-type: none"> 1. All women are mortal. 2. Some women are not mortal. <hr/> <ol style="list-style-type: none"> 3. 2+2=5.
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(Notice that argument 5 is valid because the conclusion is itself logically true -- the conclusion can't be false, so it obviously can't be false at the same time the premises are true. Example 6 is valid because the premises can't possibly all be true -- therefore they can't be true while the conclusion is false. We won't worry much about cases like this.) Arguments are valid or invalid based on their form, not their content. We can replace the components in arguments 1 and 4 with different parts, and we'll still have valid arguments:

7	<ol style="list-style-type: none"> 1. All dogs are immortal. 2. Aristotle is a dog. <hr/> <ol style="list-style-type: none"> 3. Aristotle is immortal. 	8	<ol style="list-style-type: none"> 1. Either Bush won the election or Kerry won the election. 2. Kerry didn't win the election. <hr/> <ol style="list-style-type: none"> 3. Bush won the election.
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As you can see in arguments 4, 5, 6, and 7, being valid isn't enough to make an argument good. An argument is **sound** if it is valid and all its premises are true. Arguments 1 and 8 are sound. (Argument 5 is also sound, though for a non-standard reason. What is it?) Arguments 6 and 7 are unsound, since their premises are not all true. Argument 4 is sound just in case God exists.

Since we've said that a valid argument is one in which the truth of the premises guarantees the truth of the conclusion, and since a sound argument has true premises, the conclusion of a sound argument must be true. We'd ideally, then, like to find sound arguments. When you're looking to evaluate an argument, the easiest thing to do is to first check its validity. Oftentimes, the argument will have an invalid form. You can test for this by trying to create an argument with the same form which is obviously invalid -- that is, which has true premises, and a false conclusion:

<ol style="list-style-type: none"> 1. If there was a high voter turnout, Bush won. 2. Bush won. <hr/> <ol style="list-style-type: none"> 3. There was a high voter turnout. 	same → form	<ol style="list-style-type: none"> 1. If Jane lives in NYC, she's a NY resident. 2. Jane is a NY resident. <hr/> <ol style="list-style-type: none"> 3. Jane lives in NYC. 	If Jane lives in Albany, then the premises are true but the conclusion false -- this form of argument can't be valid.
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Even if the argument has a good form, it usually won't be formally valid because the author will have suppressed a premise or three. Fill in the gaps as best (and as charitably as) you can to create a valid argument. If you're able to create a valid argument, all that's left to do is evaluate the premises. If they're true, so is the conclusion. If not, then you're most of the way towards articulating your objection.

"Failing to chop up the healthy patient would lead to five more deaths, so utilitarianism requires you to chop her up, no matter how squeamish you may feel."	made → valid	<ol style="list-style-type: none"> 1. Failing to chop up the healthy patient would ensure that five die. 2. The five's dying would result in less pleasure (more pain) than would chopping up the patient. 3. Utilitarianism requires you to maximize pleasure (minimize pain). 4. Utilitarianism requires you to chop up the healthy patient. 	The most promising spot for objection seems to be premise #2.
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