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# A GUIDE TO ARGUMENT ANALYSIS

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The analysis of arguments is key to doing good philosophy, but even more than this, it is one of the most useful tools you will take with you outside a philosophy course. Many years of teaching has shown that most students analyze an argument usually by just noting that some premises are false (if they want to argue *against* the conclusion) or by noting that the premises are true, if they want to argue *for* the conclusion. Many times their arguments for or against the truth of premises are just as weak or unconvincing as the original argument, which makes for a poor counter or supportive argument. This short step by step guide with tips along the way is designed to increase your tools for analyzing arguments.

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## STEP 1. CAREFULLY READ AND THINK ABOUT THE ARGUMENT

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When presented with an argument in Philosophy, you should carefully read the argument and identify the primary conclusion and all of the premises used to support that conclusion. Informally, to identify the conclusion ask yourself, What claim or point is the author trying to make? To identify the premises ask yourself, What reasons are presented to convince you of the truth of the claim? To illustrate this skill, consider this example argument:

It is a good idea to make sure you have working fire alarms in your house. Just look at the family whose house burned down on Christmas. They lost everything in their house, and almost lost their daughter who nearly died of smoke inhalation. Their house did not have working fire alarms, and for that reason, the fire itself went unnoticed while the family slept. They were saved only by the chance occurrence of a neighbor's teenage son arriving home late from a Christmas-eve date who noticed the fire and woke the family up.

Now use the clues given above to identify the main conclusion. Check the footnote below to see if your answer is correct.<sup>1</sup> Once we have identified the main conclusion, we can treat the remaining parts of the argument as premises used to support the conclusion.

The above argument is not really “controversial” because it addresses an almost universal concern of not wanting to die of smoke inhalation, esp. since easy and cheap steps can be taken to help prevent it. But other arguments we will encounter in philosophy have conclusions which run contrary to statements which you already believe, perhaps strongly. In these cases it is very important to carefully read what the argument states and the reasons given for it. You should never argue against a given argument for a reason not actually given by the author! Here is an example of an argument and a bad counter-argument.

**Argument:** When we die, we no longer are able to think or experience anything, since experience and thinking have been shown to be the products of a working brain. Change brain chemistry or slice out parts of the brain, and we no longer think or perceive the world

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<sup>1</sup> The conclusion is that it is a good idea to have working fire alarms in one's house. In this case the conclusion comes at the beginning and the rest of the argument provides reasons that support that conclusion. Note conclusions can be anywhere in an argument, not just at the beginning.

the same. Science has clearly demonstrated the connection between the workings of a brain and thinking and experience – just consider the many examples of antidepressant drugs or the success of anesthesia to turn off experience during a major surgery or the effect of a lobotomy, to name a few. It is unreasonable to believe that brain processes which lead to thinking and experience continue when the brain is no longer working or functioning, which is the case when we die.

First carefully read the above argument. Did you agree with the conclusion before you read the argument? Did the argument give you any reason to doubt your conclusion if you did not agree, or further reasons to believe the conclusion if you did? What claims are made by the author, and what examples or evidence might the author have included? In either case, consider the following counterargument:

**Counterargument.** The author of the above claims that science is the only method by which things can be known, but this is not correct. Religion, meditation, and mystical experience are other ways things can be known, and for all the author or science knows, some thinking might be related to no changes in the brain or brain chemistry. Hence since this can not be known for certain, the author's conclusion that when we die, we no longer are able to think or experience anything can not be known for certain either.

Notice that the conclusion to the counterargument is that the occurrence of thinking and experience after death can not be known for certain. Does the author provide good reasons for this claim? Notice that he states that the first argument claims that science is the only method by which things can be known. Is this correct? Is this something claimed in the first argument? If not, then to say such a claim was made, when it was not, does not strengthen the counterargument – if anything it weakens it, since it suggests that the person making the counterargument has not carefully considered the original. Also note that the author makes certain statements which are supposed to support his point of view, but gives no reason why these statements are true. For example, what evidence (or illustrative example) is given to support the claim that religion, meditation and mystical experience are indeed other ways things can come to be known. Would you be more convinced by the counterargument if evidence for this was given, or at least alluded to? These observations lead us to the following three tips:

**Tip 1.** Always fairly and accurately represent the claims made in any argument you attempt to analyze.

**Tip 2.** Don't let your conclusions stand alone! Always provide at least one reason or illustrative example to support any claim you make in your own argument.

**Tip 3.** When considering an argument – think about reasons which might support the given conclusion and reasons which might not support the given conclusion. Did the author of the original argument include these? If you are arguing against the original, point out these omissions. If you are arguing for the original, point out the absence of such omissions, or offer more evidence.

In what follows we offer several other steps one can take when analyzing an argument. They can be considered in any order and used singly or all at once. Many of these steps will be new to some, and the vocabulary terms presented might have different meanings than what you might be used to.

## **STEP 2. IDENTIFY WHETHER THE ARGUMENT IS VALID OR INVALID**

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Since the terms “valid” and “invalid” mean something different in the world of logic than in ordinary conversation, let us first define each and then discuss how knowing this aspect of an argument allows one to better analyze it.

An argument is said to be **valid** if the truth of its premises guarantee the truth of the conclusion. Another way of saying this is that an argument is valid if it is (logically) impossible to have a false conclusion and all true premises.

On the other hand, an argument is said to be **invalid** if it is possible to have a false conclusion and all true premises (no matter how remote that possibility may be).

Before turning to some examples, two points of common confusion should be mentioned now.

The term valid does not mean true, and invalid does not mean false. These terms describe instead possible truth conditions for an argument’s conclusion, *given the assumption that all of the premises are true*. With this said, re-read the above definitions one more time.

Another common misconception is to think a valid argument has a true conclusion. This is only partially correct. A valid argument must have a true conclusion **only if** every single premise is **actually** true. On the other hand, an invalid argument need not have a true conclusion, even if every single premise is true. This information is summarized in the following table:

<b>Premises</b>	<b>Conclusion</b>	
	<b>VALID</b>	<b>INVALID</b>
All true	Must be true	Need not be true
Not all true (at least one is false)	Need not be true	Need not be true

The natural question now is how does one determine whether an argument is valid or invalid? Unfortunately a complete answer to that question goes well beyond the scope of this introductory guide. That said, one way to discover whether an argument is **invalid** is to just *pretend* for a second that all the premises really are true – then ask yourself if the conclusion can be false without making one of the premises false at the same time. If the answer is no, then you have at least a reason to suspect the argument is valid. On the other hand, if the answer is clearly yes, then you have a sufficient reason to conclude the argument is **invalid**.

So how does this help with argument analysis? Well, if one knows an argument is valid, and yet suspects the conclusion to be false, the **only hope** one has of showing that is to show at least one of the argument’s premises is false. On the other hand, if an argument is **valid** and one wishes to argue for it, one need only provide reasons why the premises are actually true, since if they are, the conclusion must then be true.

Here is a very simple example of a **valid** argument:

If it is Friday, then interstate traffic will be terrible.

But interstate traffic is not terrible.

Hence it is not Friday.

Recall, we are keeping the example as simple as we can, and for the moment we are going to ignore the ability to just look at a calendar or your cell phone to check the day of the week. Now the argument is valid, but suppose you wish to argue that it is not Friday (in other words, you wish to argue against it). The only way you could do so is to somehow show either the interstate traffic really is terrible or that the connection between Friday and interstate traffic being terrible is false. In other words, you cast doubt on the second premise, the first premise, or both.

On the other hand, if you wish to agree with the argument's conclusion, since the argument is valid all you need to do is to give reasons why the premises really are true, since their truth guarantees the truth of the conclusion as that is the very definition of a valid argument.

In comparison if an argument is **invalid** to argue against it one can point out the conditions that would allow for all true premises and false conclusion, and show that those conditions are indeed reasonable (in the sense of "likely to be true"). On the other hand, if you wish to support the conclusion of an argument which is invalid, you need to show that the conditions that would result in all true premises and a false conclusion are quite rare. Again, we look at a simple example of an **invalid** argument..

If it rains, then the streets are wet.

It has not rained.

Therefore the streets are not wet.

In this case, since the argument is invalid, to argue against the conclusion all one needs to do is point out reasons where the premises are still true but the conclusion is false. One such reason might be, "It snowed last night, and warmed up today and melted, making the streets wet". On the other hand, if you wished to argue for the conclusion, you point out that the conditions that might normally make the premises true but the conclusion false rarely occur. For example, one might note that it is summer and hence the streets can't be wet due to snow melt. To be really successful, each reasonable possibility that would result in wet streets without rain would be addressed and rebuffed.

These observations lead to the following useful information concerning arguments.

**Fact 1.** If an argument is valid and actually has all true premises, then new information can not make the conclusion false, unless part of that new information makes at least one existing premise false.

**Fact 2.** If an argument is invalid and actually has true premises, then new information can change the truth of the conclusion, even if the new information does not make at least one existing premise false.

### STEP 3. ASSUME ALL PREMISES ARE TRUE AND FOLLOW THE CONSEQUENCES

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Another way one can analyze an argument is to actually consider what conclusion follows from the original premises on your own. Do you conclude the same thing as the author of the argument? Why or why not? Consider the example of our first argument given above:

It is a good idea to make sure you have working fire alarms in your house. Just look at the family whose house burned down on Christmas. They lost everything in their house, and almost lost their daughter who nearly died of smoke inhalation. Their house did not have working fire alarms, and for that reason, the fire itself went unnoticed while the family slept. They were saved only by the chance occurrence of a neighbor's teenage son arriving home late from a Christmas-eve date who noticed the fire and woke the family up.

Here one may argue that given the truth of these premises, one should conclude not that it is just a good idea to have working fire alarms in your house, but rather *it should be illegal not to have them*. Notice that concluding that "it should be illegal not to have fire alarms" is to argue *another conclusion that is different and more forceful than the original* which just states that it is a good idea. Since it is not immediately clear that someone who does this is arguing for the conclusion (by adding an additional condition, "not only is it a good idea, but it should be illegal not to have them), or against it, (it is not a merely a good idea, but should be illegal . . .), we merely note the following:

**Tip 4.** When analyzing an argument, consider other conclusions which follow from the truth of the premises which may not be included in the original argument.

Finally, it could happen that by careful reasoning, where each step in the reasoning process follows validly from previous steps, that one may arrive at a conclusion which is *contrary*<sup>2</sup> to the original conclusion, which means the original conclusion must be false (if the premises are true). Here is an example.

Where  $n$  is any whole number (positive or negative), then an even number by definition is any number which equals  $2n$  for some whole number  $n$ . An odd number, by definition is any number which equals  $2m + 1$  for some whole number  $m$ . Hence the sum of two odd numbers is odd.

Notice the conclusion to this argument is that the sum of two odd numbers is odd. Setting aside the fact that we all know this is false, let us use the above method to show that the conclusion *must always be false*. We first assume the premises are true. We need to add two odd numbers and show by valid inference that this results in a conclusion contrary to the original. Noting that mathematical operations such as rearranging terms and using the property of distribution are all valid inferences, we have the following argument:

Let  $m$  and  $n$  be two whole numbers. Then (by definition)  $2n + 1$  and  $2m + 1$  are two odd numbers. Their sum is  $2n + 1 + 2m + 1 = 2n + 2m + 2 = 2(n + m) + 2 = 2(m + n + 1)$ . Since the sum of whole numbers is another whole number, then  $m + n + 1$  is also a whole number, hence by definition  $2(m + n + 1)$  is an even number, which is contrary to the original assumption that the sum of two odd numbers is odd.

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<sup>2</sup> Two statements are *contrary* if it is impossible for both to be true (both, however might be false).

Notice that the above argument is perfectly general, it covers the addition of any two odd numbers by appealing to the general (abstract) property that makes a whole number odd. It would be impossible to prove that the sum of two odd numbers is *always* even by listing all possible sums of even numbers, as there are an infinite number of them.

While this example may lead you to think that arguments of this type are only found in mathematics, this is not so. As you start examining arguments, you will probably come across an argument of this type that is not in the field of mathematics, and when they occur, they are devastating, since not only do you argue against the stated conclusion, your argument shows the stated conclusion *must be false!*

## STEP 4. IDENTIFY LOGICAL FALLACIES

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A logical fallacy is an argument that seems to present a good case for its conclusion, but for various reasons fails to do so. There are many logical fallacies, so many that we will only discuss one for illustrative purposes and provide a list of the more common fallacies with an online reference for further information. The point we wish to make here is that the existence of a logical fallacy in an argument does not mean the conclusion to the argument must be false or is probably false. This means when analyzing an argument (assuming it contains more reasons to accept the conclusion than just the fallacious ones), one should point out that part of the argument which is a fallacy, name the fallacy (or explain in your analysis why it is a fallacy), and state the conclusion of the argument is neither strengthened or weakened by the part of the argument that is fallacious.

As usual, it is helpful to illustrate this process by an example. First we need a logical fallacy.

An **ad hominem fallacy** occurs when some personal characteristic of the arguer is attacked rather than the conclusion of the argument itself.

**Example:** President Smith just signed a treaty with Bolivia which will open the doors to more trade between those two countries by removing tariffs and other economic obstacles which prevented many companies from doing business with Bolivia. However, these tariffs were put in place to prevent corporations from simply packing up and moving to whichever country is the most economically depressed and hence has the cheapest work force. The end result will be loss of jobs in the USA, and no real help to the Bolivian people, since the profits will go to those Bolivians which are already extremely rich. Beside this, President Smith's wife, who accompanied him on his diplomatic mission to Bolivia to sign the treaty, refused to eat "*cuy*" which is a national dish of Bolivia, offending all Bolivians present at the treaty signing ceremony. Hence not only does President Smith not care about his own fellow Americans, he has a wife who is so insensitive to the Bolivian people that she insulted all of them needlessly. Clearly President Smith's decision to sign the treaty with Bolivia is wrong.

Observe the above argument gives some reasons why the given treaty would be a bad idea, but also commits the *ad hominem fallacy* by attacking President Smith's wife. The correct way to analyze this argument is to point out the premises whose truth does affect the conclusion (e.g. jobs being lost in the USA, economic benefits not going to the average Bolivian), and point out that the comment about President Smith's wife is an *ad hominem* attack and is irrelevant to the truth of the conclusion.

Since it is impossible to point out logical fallacies if you are unable to identify them, I list below some common logical fallacies and give a link at the end where many more are given. It is helpful to become familiar with as many as possible.

<b>Some Common Logical Fallacies</b>	
<b>Common Name</b>	<b>Characteristic Properties</b>
<i>Post hoc (ergo propter hoc)</i>	Since <i>y</i> follows <i>x</i> , then <i>x</i> is the cause of <i>y</i>
Hasty generalization	Takes a small set of examples and assumes all other examples are the same
Appeal to (inappropriate) authority	Appeals to the opinions of someone who is not an expert in the given field under debate
False dilemma	Presents two choices (many times extreme) as if they were the only ones, when there are others
Argument from ignorance	Assumes <i>x</i> is false since it has not been proven true, or that <i>x</i> is true, since <i>x</i> has not been shown to be false (hint: this fallacy is committed in the counterargument on page 2, can you find it?)

There are several great online sites with many more logical fallacies. The link listed below is a good place to start. The author, Stephen Downes, is the chair of the Philosophy department at the University of Utah at the time of this writing.

<http://onegoodmove.org/fallacy/>

## CONCLUSION

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In conclusion, notice that in all of the above steps, not a single one starts first by examining the actual truth or falsity of the premises – which is normally the first (and perhaps only) method that beginning learners use when starting to analyze an argument. Also, we should point out that one should decide the reasonableness of a given conclusion in light of all available arguments. It is bad philosophy to decide beforehand whether you accept an argument's conclusion before careful consideration of the argument and the evidence.

In closing we remind the reader that the above steps are not exhaustive. There are many more ways one can analyze an argument (for example, the very powerful method of *argument by analogy* or the *role of definitions* in argument analysis), and much more could be said about the actual steps that we have outlined. But when learning something new, it is best to start out with small steps and then move onward, and hopefully the steps presented here accomplish that task.

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