Philosophical Terms and Methods

Vocabulary Describing Arguments

Contents

Most of the arguments philosophers concern themselves with are--or purport to be--**deductive** arguments. Mathematical proofs are a good example of deductive argument.

Most of the arguments we employ in everyday life are not deductive arguments but rather **inductive** arguments. Inductive arguments are arguments which do not attempt to establish a thesis *conclusively.* Rather, they cite evidence which makes the conclusion *somewhat reasonable to believe.* The methods Sherlock Holmes employed to catch criminals (and which Holmes misleadingly called "deduction") were examples of inductive argument. Other examples of inductive argument include: concluding that it won't snow on June 1st this year, because it hasn't snowed on June 1st for any of the last 100 years; concluding that your friend is jealous because that's the best explanation you can come up with of his behavior, and so on.

It's a controversial and difficult question what qualities make an argument a good inductive argument. Fortunately, we don't need to concern ourselves with that question here. In this class, we're concerned only with *deductive* arguments.

Philosophers use the following words to describe the qualities that make an argument a good deductive argument:

Valid Arguments

We call an argument **deductively valid** (or, for short, just "valid") when the conclusion is entailed by, or logically follows from, the premises.

Validity is a property of the argument's *form.* It doesn't matter what the premises and the conclusion actually say. It just matters whether the argument has the right form. So, in particular, a valid argument *need not* have true premises, nor need it have a true conclusion. The following is a valid argument:

1. All cats are reptiles.
2. Bugs Bunny is a cat.
3. So Bugs Bunny is a reptile.

Neither of the premises of this argument is true. Nor is the conclusion. But the premises are of such a form that *if* they were both true, then the conclusion would also have to be true. Hence the argument is valid.

To tell whether an argument is valid, figure out what the *form* of the argument is, and then try to think of some other argument of *that same form* and having true premises but a false conclusion. If you succeed, then every

argument of that form must be invalid. A valid form of argument can *never* lead you from true premises to a false conclusion.

For instance, consider the argument:

1. If Socrates was a philosopher, then he wasn't a historian.
2. Socrates wasn't a historian.
3. So Socrates was a philosopher.

This argument is of the form "If P then Q. Q. So P." (If you like, you could say the form is: "If P then not-Q. not-Q. So P." For present purposes, it doesn't matter.) The conclusion of the argument is true. But is it a valid form of argument?

It is not. How can you tell? Because the following argument is of the same form, and it has true premises but a false conclusion:

1. If Socrates was a horse (this corresponds to P), then Socrates was warm-blooded (this corresponds to Q).
2. Socrates was warm-blooded (Q).
3. So Socrates was a horse (P).

Since this second argument has true premises and a false conclusion, it must be invalid. And since the first argument has the same form as the second argument (both are of the form "If P then Q. Q. So P."), both arguments must be invalid.

Here are some more examples of invalid arguments:

The Argument	**Its Form**
If there is a hedgehog in my gas tank, then my car will not start. My car will not start. Hence, there must be a hedgehog in my gas tank.	If P then Q. Q. So P.
If I publicly insult my mother-in-law, then my wife will be angry at me. I will not insult my mother-in-law. Hence, my wife will never be angry at me.	If P then Q. not-P. So not-Q.
Either Athens is in Greece or it is in Turkey. Athens is in Greece. Therefore, Athens is in Turkey.	Either P or Q. P. So Q.
If I move my knight, Christian will take my knight. If I move my queen, Christian will take my knight. Therefore, if I move my knight, then I move my queen.	If P then Q. If R then Q. So if P then R.

Invalid arguments give us no reason to believe their conclusions. **But be careful:** The fact that an argument is invalid doesn't mean that the argument's conclusion is false. The conclusion might be true. It's just that the invalid argument doesn't *give us any good reason to believe* that the conclusion is true.

If you take a class in Formal Logic, you'll study which forms of argument are valid and which are invalid. We won't devote much time to that study in this class. I only want you to learn what the terms "valid" and "invalid" mean, and to be able to recognize a few clear cases of valid and invalid arguments when you see them.

Exercise

For each of the following arguments, determine whether it is valid or invalid. If it's invalid, explain why.

Your high idle is caused either by a problem with the transmission, or by too little oil, or both.

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You have too little oil in your car.
Therefore, your transmission is fine.

If the moon is made of green cheese, then cows jump over it.
The moon is made of green cheese.
Therefore, cows jump over the moon.

Either Colonel Mustard or Miss Scarlet is the culprit.
Miss Scarlet is not the culprit.
Hence, Colonel Mustard is the culprit.

All engineers enjoy ballet.
Therefore, some males enjoy ballet.
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Sometimes an author will not explicitly state all the premises of his argument. This will render his argument invalid as it is written. In such cases we can often "fix up" the argument by supplying the missing premise, assuming that the author meant it all along. For instance, as it stands, the argument:

1. All engineers enjoy ballet.
2. Therefore, some males enjoy ballet.

is invalid. But it's clear how to fix it up. We just need to supply *the hidden premise*:

1. All engineers enjoy ballet.
2. *Some engineers are male.*
3. Therefore, some males enjoy ballet.

You should become adept at filling in such missing premises, so that you can see the underlying form of an argument more clearly.

Exercise

Try to supply the missing premises in the following arguments:

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If you keep driving your car with a faulty carburetor, it will eventually explode.
Therefore, if you keep driving your car with a faulty carburetor, you will eventually
get hurt.

Abortion is morally wrong.
Abortion is not a constitutional right.
Therefore, abortion ought to be against the law.
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Sometimes a premise is left out because it is taken to be obvious, as in the engineer argument, and in the exploding car argument. But sometimes the missing premise is very contentious, as in the abortion argument.

Sound Arguments

An argument is **sound** just in case it's valid *and* all its premises are true.

The argument:

1. If the moon is made of green cheese, then cows jump over it.
2. The moon is made of green cheese.
3. Therefore, cows jump over the moon.

is an example of a valid argument which is not sound.

We said above that a valid argument can never take you from true premises to a false conclusion. So, if you have a sound argument for a given conclusion, then, since the argument has true premises, and since the argument is

valid, and valid arguments can never take you from true premises to a false conclusion, the argument's conclusion *must* be true. Sound arguments always have true conclusions.

This means that if you read Philosopher X's argument and you disagree with his conclusion, then you're committed to the claim that his argument is unsound. Either X's conclusion does not actually follow from his premises--there is a problem with his reasoning or logic--or at least one of X's premises is false.

When you're doing philosophy, it is never enough simply to say that you disagree with someone's conclusion, or that his conclusion is wrong. If your opponent's conclusion is wrong, then there must be something wrong with his argument, and you need to say what it is.

Exercise

Here are some sample arguments. Can you tell which ones are valid and which of the valid arguments are also sound? (There are 5 valid arguments and 2 sound arguments.)

I. If Socrates is a man, then Socrates is mortal. Socrates is a man. So, Socrates is mortal.

II. If Socrates is a horse, then Socrates is mortal. Socrates is a horse. So, Socrates is mortal.

III. If Socrates is a horse, then Socrates has four legs. Socrates is a horse. So, Socrates has four legs.

IV. If Socrates is a horse, then Socrates has four legs. Socrates doesn't have four legs. So, Socrates is not a horse.

V. If Socrates is a man, then he's a mammal. Socrates is not a mammal. So Socrates is not a man.

VI. If Socrates is a horse, then he's warm-blooded. Socrates is warm-blooded. So Socrates is a horse.

VII. If Socrates was a philosopher then he wasn't a historian. Socrates wasn't a historian. So, Socrates was a philosopher.

Persuasive Arguments

Unfortunately, merely having a sound argument is not yet enough to have the persuasive force of reason on your side. For it might be that your premises *are* true, but it's *hard to recognize* that they're true.

Consider the following two arguments:

Argument A	**Argument B**
1. Either God exists, or 2+2=5.	1. Either God does not exist, or 2+2=5.
2. 2+2 does not equal 5.	2. 2+2 does not equal 5.
3. So God exists.	3. So God does not exist.

Both of these arguments have the form "P or Q. not-Q. So P." That's a valid form of argument. So both of these arguments are valid. What's more, at least one of the arguments is sound. If God exists, then all the premises of Argument A are true, and since Argument A is valid, it must also be sound. If God does not exist, then all the premises of Argument B are true, and since Argument B is valid, it must also be sound. Either way, one of the arguments is sound. But we can't tell *which* of these arguments is sound and which is not. Hence neither argument is very **persuasive**.

In general, when you're engaging in philosophical debate, you don't just want valid arguments from premises that happen to be true. You want valid arguments from premises that are *recognizable* as true, or already accepted as true, by all parties to your debate.

Hence, we can introduce a third notion:

> A **persuasive** argument is a valid argument with plausible, or obviously true, or antecedently accepted premises.

These are the sorts of arguments you should try to offer.

Conditionals

A claim of the form "If P then Q" is known as a **conditional**. P is called the **antecedent** of the conditional, and Q is called the **consequent** of the conditional.

In this class, you can take all of the following to be variant ways of saying the same thing:

- If P then Q
- P implies Q
- P -> Q
- P is sufficient (or: a **sufficient condition**) for Q
- If you've got P you must have Q
- A **necessary condition** for having P is that you have Q
- Q is necessary for having P
- It's only the case that P if it's also the case that Q
- P only if Q

Note the terms **sufficient condition** and **necessary condition**.

> To say that one fact is a sufficient condition for a second fact means that, so long as the first fact obtains, that's enough to guarantee that the second fact obtains, too. For example, if you have ten children, that is sufficient for you to be a parent.
>
> To say that one fact is a necessary condition for a second fact means that, in order for the second fact to be true, it's required that the first fact also be true. For example, in order for you to be a father, it's necessary that you be male. You can't be a father unless you're male. So being male is a necessary condition for being a father.
>
> When P entails Q, then P is a sufficient condition for Q (if P is true, that guarantees that Q is true, too); and Q is a necessary condition for P (in order for P to be true, Q also has to be true).

Exercise

Consider the following pairs and say whether one provides sufficient and/or necessary conditions for the other.

1. a valid argument, a sound argument

2. knowing that it will rain, believing that it will rain

Now, just because P entails Q, it doesn't follow that Q entails P. However, sometimes it's *both* the case that P entails Q *and* also the case that Q entails P. When so, we write it as follows (again, all of these are variant ways of saying the same thing):

- P if and only if Q
- P iff Q
- P just in case Q
- P <-> Q
- if P then Q, and if Q then P
- P is both sufficient and necessary for Q
- P is a necessary and sufficient condition for Q

For example, being a male parent is both necessary and sufficient for being a father. If you're a father, it's required that you be a male parent. And if you're a male parent, that suffices for you to be father. So we can say that someone is a father if and only if he's a male parent.

Consistency

When a set of propositions cannot all be simultaneously true, we say that the propositions are **inconsistent**. Here is an example of two inconsistent propositions:

1. Oswald acted alone when he shot Kennedy.
2. Oswald did not act alone when he shot Kennedy.

When a set of propositions is *not* inconsistent, then they're **consistent**. Note that consistency is no guarantee of truth. It's possible for a set of propositions to be consistent, and yet for some or all of them to be false.

Sometimes we say that a proposition P is **incompatible** with another proposition Q. This is just another way of saying that the two propositions are inconsistent with each other.

A **contradiction** is a proposition that's inconsistent with itself, like "P and not-P."

Sometimes it's tricky to see that a set of propositions is inconsistent, or to determine which of them you ought to give up. For instance, the following three propositions all seem somewhat plausible, yet they cannot all three be true, for they're inconsistent with each other:

1. If a person promises to do something, then he's obliged to do it.
2. No one is obliged to do things which it's impossible for him to do.
3. People sometimes promise to do things it's impossible for them to do.

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