# PHI 201, Introductory Logic

Feb 03, 2005

## 1 What's an argument?

Our main objects of study are **arguments**. For example:

1. If a fetus is not a person then a fetus has no rights.
2. If a fetus has no rights, then no one can be charged for murdering a fetus.
3. Someone has been charged for murdering a fetus.
4. Therefore, a fetus is a person.

You know one when you see one. But can you say what makes something an argument?

- An argument consists of one sentence (called the **conclusion** ) that is supposed to be established (or made more plausible) by the argument, and one or more other sentences (called the **premises** ) that are supposed to be doing the supporting.
- Not every sentence can be a conclusion or a premise. For example, questions, proposals, and exclamations cannot be premises or conclusions.
- A sentence is called a **statement** if it can be true or false. The premises and conclusion of an argument are all statements.

## 2 Two types of arguments

### 2.1 Ampliative arguments

Example:

1. Patient number 12 recovered after taking Acme Cold Remedy.
2. Patient number 73 recovered after taking Acme Cold Remedy.
3. Patient number 17 recovered after taking Acme Cold Remedy.
4. Therefore, probably all patients will recover after taking Acme Cold Remedy.

- Note that no matter how much evidence we collect, the conclusion still *could be* false—even if only a crazy person would deny it.
- These sorts of arguments are generally called "ampliative", because the conclusion says more than is strictly "entailed" by the premises. (This particular argument is an example of an "inductive" argument. In an inductive argument, the premises state that something holds in specific cases, and the conclusion states that we can expect the same to hold in general.)
- What's the difference between "good" and "bad" ampliative arguments? Unfortunately, we don't know. Nobody has been able to figure this out.

## 2.2 Deductive arguments

- For the most part, we will restrict ourselves to deductive arguments—those where the premises are supposed to leave no question open about the truth of the conclusion.

For example:

1. All Presidents are US citizens.
2. Bush is the President.
3. Therefore, Bush is a US citizen.

**Our main questions:** How can we tell, in general, if a deductive argument is good? What criteria determine whether or not a deductive argument is good?

## 3 We don’t care about the truth

Consider again our example argument:

1. If a fetus is not a person then a fetus has no rights.
2. If a fetus has no rights, then no one can be charged for murdering a fetus.
3. Someone has been charged for murdering a fetus.
4. Therefore, a fetus is a person.

Last lecture, many of you said that this is a bad argument. When asked why you thought it was bad, most people questioned one of the premises.

But, qua logician, I don’t care about whether a fetus is a person or about whether a person has rights. In fact, I simply do not care whether or not the premises are true. The reason I don’t care is because: *The question of whether the premises support the conclusion is a hypothetical question.* The question isn’t:

> Should one believe the conclusion?

But,

> If one believes the premises, then should one believe the conclusion.

In the case of the example argument, the answer is Yes! (You will soon see why.)

- An argument is **valid** if its conclusion follows logically from its premises.

There are many synonyms for the phrase ”follows logically from“:

- “is entailed by”
- “is a logical consequence of”

- "is implied by"

**Let's restate our goal:** We aim to define and analyze the phrase "follows logically from" (and thereby all of its synonyms). We aim to do so in such a way that it becomes *easy* to check whether or not a conclusion does follow logically from some premises.

If an argument passes our test, it is called **valid**. So, to be clear, an argument is valid just in case its conclusion follows logically from its premises.

A valid argument need not be an argument whose conclusion you would accept. For example:

1. If Princeton is New Jersey, then the moon is made of yellow cheese.
2. The moon is made of green cheese.
3. Therefore, Princeton is not in New Jersey.

**Our first shot analysis:** An argument is valid if the following hypothetical statement holds:

> If the arguments premises *were* true, then its conclusion would also be true.

An argument is called **sound** if it is valid and has true premises.

**Mini quiz:**

1. If an argument has a true conclusion, then is it valid?
2. If an argument has a false conclusion, then is it invalid?
3. If we know that an argument is valid, can we say anything about whether or not its premises or conclusion are true?

Consider now the following arguments:

1. If God doesn’t exist, then everything is permitted.
2. God exists.
3. Therefore, not everything is permitted.

1. Some CEO’s live in New Jersey.
2. Some people who live in New Jersey are rich.
3. Therefore, some CEO’s are rich.