**Philosophical Method Day 9: Fallacies**

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| **Content:**  1. Fallacies (15 minutes)  2. Formal Fallacies (15 minutes)  3. Informal Fallacies (20 minutes) | **Method:**  1. Lecture and class exercise  2. Lecture  3. Lecture and small group activity |

***Instructor’s Introduction***: This lesson introduces students to logical fallacies: argument types which people commonly think are valid but which are not.

# *Goals and Key Concepts*

1. Students should understand what a fallacy is and some common types of fallacies.
2. Students should understand the distinction between a formal fallacy and an informal fallacy.
3. Key concepts: **(logical)** **fallacy, formal fallacy, informal fallacy**

**1. Fallacies**

Simply put, fallacies (sometimes more precisely called logical fallacies) are arguments that are not good (they are invalid or weak), but which people often mistakenly think are good. We study fallacies so that we can be more aware of common mistakes in reasoning; if we know what the common mistakes are, we can typically avoid them ourselves and quickly recognize them when made by others without needing to do more involved analysis. Hence, a typical approach to studying fallacies is review categories of common ways in which people reason in an incorrect fashion.

Common examples we’ll examine include:

* Affirming the consequent
* Denying the antecedent
* Begging the question (circular arguments)
* Straw man
* Ad hominem
* Hasty generalization
* Slippery slope
* Fallacy of composition
* Etc.

Write the following four arguments on the board and ask students which they think are valid and which they think are invalid (ask them to just judge intuitively at this point).

1) If the clock is working, it is noon.

The clock is working.

It is noon.

2) If the clock is working, it is noon.

It is noon.

The clock is working.

3) If the clock is working, it is noon.

It is not noon.

The clock is not working.

4) If the clock is working, it is noon.

The clock is not working.

It is not noon.

After taking a poll, ask students to translate the four arguments into symbolic form, write out truth tables for them, and evaluate if they are valid or invalid.

**2. Formal Fallacies**

Let’s take a look at the analysis of the four arguments above:

1) This argument is translated as:

P → Q

P

Q

The truth table is the following:

|  |  |  |
| --- | --- | --- |
| **P** | **Q** | **P → Q** |
| T | T | T |
| T | F | F |
| F | T | T |
| F | F | T |

From the truth table, we can see that both premises are true only on the first row. On that row, the conclusion is also true. Hence this argument is valid. It turns out that this is a very common form of argument—that is, many arguments end up getting translated into symbols exactly the same way. Obviously, every argument which has this form is valid. Hence, we have given it a name, modus ponens, and know that any time we come across an argument that gets translated this way, the argument is valid.

2) This argument is translated as:

P → Q

Q

P

The truth table is the following:

|  |  |  |
| --- | --- | --- |
| **P** | **Q** | **P → Q** |
| T | T | T |
| T | F | F |
| F | T | T |
| F | F | T |

On the third row, the two premises are true but the conclusion is false. Hence this argument is invalid. The clock may have stopped working at noon yesterday and just happens to coincidentally be showing the correct time. Often people intuitively think this argument is valid, though. There are a couple of reasons. Thinking about the particular argument, it’s true that it takes a lucky coincidence for a nonworking clock to be showing the correct time—most of the day it will not. But it is possible. More importantly, this argument form looks a lot like modus ponens, and so when we come across arguments of this form, people often assume they are valid because similar arguments are good, commonly used arguments. Since this argument form is commonly used despite being invalid, it is a fallacy known as the fallacy of affirming the consequent.

3) This argument is translated as:

P → Q

¬Q

¬P

The truth table is the following:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **P** | **Q** | **P → Q** | **¬P** | **¬Q** |
| T | T | T | F | F |
| T | F | F | F | T |
| F | T | T | T | F |
| F | F | T | T | T |

The two premises are both true on only the fourth row. On that row, the conclusion is also true. Hence this argument is valid. Like example one, this is a common valid argument form, and we have given it the name modus tollens.

4) This argument is translated as:

P → Q

¬P

¬Q

The truth table is the following:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **P** | **Q** | **P → Q** | **¬P** | **¬Q** |
| T | T | T | F | F |
| T | F | F | F | T |
| F | T | T | T | F |
| F | F | T | T | T |

On the third row, the two premises are both true but the conclusion is false. Hence this argument is invalid. Like in example two, though the clock isn’t working it will still show the correct time twice a day. Again, since most of the time a non-working clock shows the incorrect time, people often make the intuitive mistake of thinking this particular argument is valid. And since it’s similar to modus tollens, people often mistakenly think the argument form is valid. Hence this argument form is a fallacy known as the fallacy of denying the antecedent.

These two fallacies, affirming the consequent and denying the antecedent, are known as formal fallacies, as opposed to informal fallacies. Formal fallacies are argument forms that look similar to valid argument forms, but when we work out the truth table, we find that they actually are not. Formal fallacies are distinguished by their formal, that is, symbolic, form.

So these two formal fallacies are defined as any argument translated as such:

Affirming the consequent

P → Q

Q

P

Denying the antecedent

P → Q

¬P

¬Q

**3. Informal Fallacies**

Most fallacies are informal. These fallacies are distinguished by a general sort of mistake in approaching how to make an argument, rather than being able to be defined by a particular symbolic form. One can find many different lists of informal fallacies, because there’s no one correct, exact way to categorize the informal fallacies. But we can give some examples of common informal fallacies:

Begging the question (circular arguments): This fallacy occurs when the author assumes (as a premise), sometimes implicitly, the conclusion the author wants to support.

Example: Anything about which we have a clear and distinct idea must be true, because God wouldn’t allow us to have a clear and distinct idea of something that is not the case. God must exist because we have a clear and distinct idea of God.

Straw man: This fallacy occurs when the author formulates a very weak version of an argument or otherwise misrepresents the argument intended by the original argument, then attacks this weak version rather than a more robust version. (As philosophers, we should always be charitable, and critique the strongest version of an opposing argument.)

Example: *Person A:* Sunny days are good. *Person B:* If all days were sunny we’d have no rain and crops would fail, leading to starvation and death. So you’re wrong.

Ad hominen: This fallacy occurs when an author attacks the opponent personally rather than the argument the opponent has put forth.

Example: John’s argument about economic policy must be wrong. He doesn’t even have a job.

Hasty generalization: This fallacy occurs when an author draws a general conclusion from too limited a sample of specific instances.

Example: I got an “A” on the assignment and so did both of my friends in the class, so probably every student got an “A” on it.

Fallacy of composition: This fallacy occurs when the author assumes that a property which applies to each member of a group applies to the group as well, or vice versa.

Example: Each member of the football team weighs less than 300 pounds, so the football team weighs less than 300 pounds.

False dichotomy: This fallacy occurs when an author suggests there are only two possibilities (or some other number), when in fact there may well be more possibilities.

Example: Either you’ll let me go to the concert or I’ll be miserable for the rest of my life. Since you don’t want me to be miserable for the rest of my life, you should let me go. (A rather famous example from political discourse is: either you are with us or you’re with the terrorists.)

Red herring (or irrelevant conclusion): This fallacy occurs when an author distracts attention away from the point of contention rather than addressing it.

Example: Sure, I admit the referendum has some good points in its favor, but there are so many issues on this ballot that the whole thing is getting ridiculous.

Appeal to majority: This fallacy occurs when an author appeals to what a majority of people think is the case as a reason for it being so, even though they may be wrong.

Example: You should buy this brand of product because it sells more than any other brand.

Slippery slope: This fallacy occurs when an author assumes that starting down a path will lead to a “slippery slope” of sliding further in that direction. This form of argument can actually be logically valid rather than a fallacy if the author shows there is a chain of logical implication for every step within the chain (or “slide”), but much more often the fallacious version is used in which there is no logical justification for continuing steps.

Example: If the government bans assault rifles, then next they’ll ban hand guns followed by hunting rifles. Hunters and sportsmen wouldn’t be able to own rifles for legitimate purposes. So we have to vote down the proposed assault rifle ban.

Class exercise: Working in small groups, have students come up with examples for each of these types of fallacies. Have the groups share their examples with the class and discuss. (If you have time, a fun version of this exercise is to have the groups write and perform skits illustrating one or two fallacies assigned to them.) As a variant, you can bring in advertisements, blogs, editorials or whatever you like and ask students to identify the fallacies.

ASSIGNMENT: Fallacies worksheet.