Deductive and Inductive Inference

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WHAT'S COVERED

In this tutorial we will begin with a review of arguments, before distinguishing two types of argument: deductive and inductive. Our discussion will break down like this:

1. Review of Arguments

To begin with, recall the nature of an argument. If you want to make an argument, then you want someone to agree with something. In order to do that, you must give them a reason to agree with you. In other words, you must give some support for whatever it is that you want someone to accept. What does the supporting are called the premises, and what is supported by the premises is called the conclusion.

The premises are statements that claim to say something true of the world. This is called a factual claim. The way you get from the factual claim to the conclusion is by saying that the conclusion follows from the supposed facts you provide. When you say that a premise supports a conclusion in this way, you are making an inferential claim.

2. Deductive and Inductive Arguments

With this in view we can now distinguish two types of argument: deductive and inductive. It is only the inferential claim that is being distinguished when arguments are separated into deductive and inductive, not the factual claims.

In deductive arguments, the premises support the conclusion so well that, assuming the premises are true, it would be inconceivable for the conclusion to be false. In other words, a successful **deductive argument** will have **logical certainty**.

Inductive arguments do not have logical certainty. This is because they only claim to show that, assuming the premises are true, it is *likely* that the conclusion is also true, not that it is necessarily true. An **inductive argument**, then, does not have logical certainty.

But there is nothing wrong with inductive arguments. We use inductive reasoning all the time.

> EXAMPLE You expect all swans to be white since you have only ever seen white swans. But it is not logically certain that you will never see a swan that is, say, green or pink. It is only very probable that you will only see white swans.

In this example, the conclusion establishes probability rather than certainty. As long as you only try to establish probability with inductive arguments, they are powerful and useful. It is only if you believe that you have established logical certainty with an inductive argument that it becomes problematic.

TERMS TO KNOW

Deductive Argument
An argument whose inferential claim is a claim of logical certainty.

Logical Certainty
Inconceivable that the conclusion is not entailed by the premises.

Inductive Argument
An argument whose inferential claim is a claim less than logical certainty.

3. Evaluating Deductive and Inductive Arguments

You need to be sure, then, to identify what type of argument you are dealing with before you can properly evaluate it. Once you know which type of argument you are dealing with, you can find out if it is successful or not.

The first two examples are inductive and the second two are deductive. This is because the conclusions in the first two are not guaranteed by the premises, whereas the conclusions are guaranteed by the premises in the last two.

For this reason, an inductive argument will always be unsuccessful as a deductive argument. A deductive argument fails if it doesn't establish logical necessity. Since an inductive argument never establishes logical necessity, it must always fail as a deductive argument.

You can see this clearly in argument (2). The premises of this argument tell you two things: that Sofia was hungry and that she was holding a burger. These things alone do not tell you that she necessarily ate the burger, only that it's likely.

BIG IDEA

It is important to distinguish inductive and deductive arguments before you evaluate them, because they aim to establish different types of conclusions.

SUMMARY

We started this tutorial with a **review of arguments**, separating out the factual claims from the inferential claims. We then looked at the difference between **deductive and inductive arguments** by distinguishing the type of inferential claim made in each.

Finally, we saw the importance of **evaluating deductive and inductive arguments** differently. Inductive arguments only aim to establish probability and should thus not be held to the same standard as deductive arguments—which aim to establish logical necessity.

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