Types of Deductive and Inductive Arguments

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WHAT'S COVERED

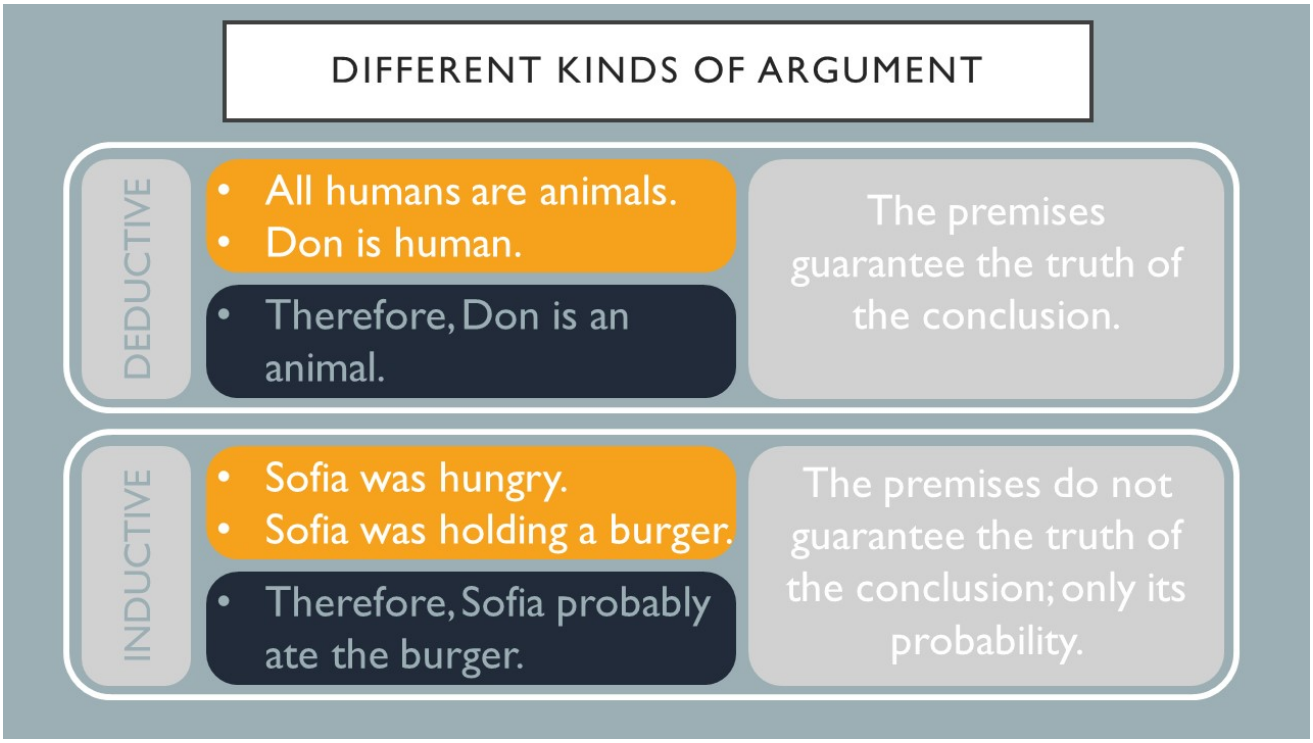
In this tutorial we will start with a review of arguments before we look at some of the main types of deductive and inductive arguments and how we can identify them. Our discussion will break down like this:

1. Review of Arguments
2. Deductive Argument Types
3. Inductive Argument Types
4. Identifying Argument Types

1. Review of Arguments

To begin with, recall that arguments can be either deductive or inductive. The main difference between these kinds of arguments is found in the level of certainty that their premises can give to their conclusions.

EXAMPLE Consider these two arguments.



You can see that the inference from the premises to the conclusion in the deductive argument is logically certain. By contrast, the inference in the inductive argument is less than logically certain, even though it is quite likely.

BIG IDEA

Since deductive and inductive arguments aim for different levels of certainty, you need to be sure of the kind of argument you are dealing with before you evaluate it.

2. Deductive Argument Types

There are many types of deductive arguments. Here are some of them, with a brief description and example for each type.

	ARGUMENT FROM DEFINITION	CATEGORICAL ARGUMENT	HYPOTHETICAL ARGUMENT
Definition	Conclusion follows from the premises based solely on the words used.	Conclusion follows from the premises based on use of "all," "no," "some," or their equivalent.	Conclusion follows from the premises based on the use of "if-then" or their equivalent.
Example	Humans are mortal. Socrates is human. Therefore, Socrates is mortal.	All authors write. Some people are authors. Therefore, some people write.	If it's night, then I use lights. It is night, therefore I use lights.

	DISJUNCTIVE ARGUMENT	ARGUMENT FROM MATHEMATICS
Definition	Conclusion follows from the premises based	Conclusion follows from the premises based on

	on use of "either-or" or their equivalent.	the meaning of mathematical terms.
Example	Either I stay in bed or leave the house. I left the house, therefore I'm not in bed.	Even numbers are divisible by 2. Eighteen is an even number, therefore 18 is divisible by 2.

You will notice that, although there are differences between each type, they all share an important similarity. They are all deductive arguments, therefore the inference in each case is supposed to be guaranteed simply by form or structure of the argument and the meaning of the words.

3. Inductive Argument Types

There are many types of inductive arguments. Here are some of them, with a brief description and example for each type.

	CASUAL INFERENCE	PREDICTION	GENERALIZATION
Definition	Conclusion follows from the premises based on inferring a cause from an effect or an effect from a cause.	Conclusion follows from the premises based on inferring that the present or future will resemble the past.	Conclusion follows from the premises based on inferring from a sample to a set, or a set to a sample.
Example	Poor diet often causes heart disease. She suffered heart disease. Therefore, she probably had a bad diet.	Greta has passed every exam so far. Greta will probably pass her next exam.	Most dogs like to fetch a ball. Rex will probably like to play fetch as well.

	ARGUMENT FROM AUTHORITY	ARGUMENT FROM SIGNS	ANALOGY
Definition	Conclusion follows from the premises based on the assumed truth or accuracy of an expert in the field.	Conclusion follows from the premises based on the association of one condition with another.	Conclusion follows from the premises based on drawing a similarity between familiar and unfamiliar things.
Example	The economics professor predicted the housing market collapse. Her other economic prediction is probably correct.	There are some bear tracks in the snow. Therefore, a bear walked through here.	Humans and animals avoid injury where possible. Humans do so partly to avoid pain. Therefore, animals feel pain.

You will notice that, although there are differences between each type, they all share an important similarity. They are all inductive arguments, therefore the inference in each case requires some knowledge of the world.

4. Practice Identifying Argument Types

It is not always easy to tell what type of argument you are dealing with. For this reason, it is important to learn to distinguish types of arguments that look like each other, but whose inference works differently. If you don’t do this you could, for instance, think a successful argument doesn’t work.

EXAMPLE Consider this argument: “Every phone I have owned takes photos. I bought a new phone today. It will probably take photos as well.”

This is an inductive generalization. But if you thought it looked like a categorical deductive argument you would say it was invalid because the premises do not make the conclusion necessarily true, only likely to be true.

TRY IT

What type of arguments do you think these are?

1. “If you cut yourself, then you will bleed. You cut yourself, therefore you will bleed.”
2. “Whenever I eat strawberries I feel ill. I will probably feel ill after eating these strawberries.”

The first argument is hypothetical, the second is a causal inference. These look similar, but the way the premises relate to the conclusion is different.

In the hypothetical argument, what is said in the conclusion only draws out what was already contained in the premises. In the causal inference, however, the conclusion refers to something not already fully known in the premises. In this instance, it is not known whether or not eating strawberries will necessarily have this effect.

SUMMARY

We started this tutorial with a **review of arguments**, focusing on the general difference between deductive and inductive arguments. Then we considered the various **deductive argument types** and saw what they all had in common.

This was followed by a similar discussion of the various **inductive argument types**, before we finally looked at how to **practice identifying argument types** by paying attention to the way the premises relate to the conclusion.