Baronett, *Logic* (4th ed.)
Chapter Guide

Chapter 1: What Logic Studies

Logic is the systematic use of methods and principles to analyze, evaluate, and construct arguments.

A. Statements and Arguments

An **argument** is a group of **statements** (sentences that are either true or false) in which the **conclusion** is claimed to follow from the **premise(s)**. An argument can have one or more premises, but only one conclusion.

"**Inference**" refers to the reasoning process expressed by an argument. In a good argument, the conclusion is supported by the evidence given in the premise(s). What distinguishes an argument from other collections of statements is its inferential nature.

B. Recognizing Arguments

Indicator words help us identify the elements of an argument.

Conclusion indicators (such as "therefore,'" "so," "it follows that") alert you to the appearance of a conclusion, while **premise indicators** (such as "since," "because," "it follows from") alert you to the appearance of a premise.

In each case, indicator words tell you that a conclusion or premise is about to be, or has just been, asserted.

C. Arguments and Explanations

An **explanation** can sometimes be taken for an argument, and vice versa. In addition, both arguments and explanations often use the same indicator words.

The crucial distinguishing feature of an argument is that the **truth of the conclusion is in question**. So, even when an explanation involves indicator words, there is no intent to prove anything or settle some sort of issue: "*Because* you were late meeting me at the restaurant for dinner, I went ahead and placed my order." Here, an explanation is offered for ordering food, an already **accepted fact**.

D. Truth and Logic

Truth value analysis refers to whether the individual statements in the argument are accurate, correct, or *true*. Truth value analysis is applied to individual **statements**.

Logical analysis, refers to the *strength* with which the premises support the conclusion. Logical analysis is applied to **arguments**.

E. Deductive and Inductive Arguments

Arguments fall into one of two types:

A **deductive argument** is one in which the conclusion follows *necessarily* from the premises. In other words, under the *assumption* that the premises are true it is *impossible* for the conclusion to be false.

An **inductive argument** is one in which the conclusion is *probably true* if the premises are true. In other words, under the *assumption* that the premises are true it is *improbable* for the conclusion to be false.

F. Deductive Arguments: Validity and Soundness

Deductive arguments are either valid or invalid and sound or unsound.

A **valid** deductive argument is one in which it is impossible for the conclusion to be false assuming that the premises are true. In other words, the conclusion follows *necessarily* from the premises. An **invalid** argument is one in which it is possible for the conclusion to be false, even if the premises are true. In this case, the conclusion *does not follow necessarily* from the premises.

A **sound** argument is valid, and its premises are actually true. An **unsound** argument is either invalid or at least one of its premises are false.

A convenient test of validity is the **counterexample** method. A **counterexample** to a statement is evidence that shows the statement is false. A counterexample to an argument shows the possibility that premises assumed to be true do not make the conclusion necessarily true. It shows the possibility that the conclusion does not follow necessarily from true premises. A single counterexample to a deductive argument is enough to show that an argument is invalid.

G. Inductive Arguments: Strength and Cogency

When we evaluate inductive arguments, we use the following concepts: strong, weak, cogent, and uncogent.

A **strong inductive argument** is one such that if the premises are *assumed* to be true, then the conclusion is *probably true*. In other words, it is improbable that the conclusion is false if the premises are assumed to be true. A **weak inductive argument** is one such that either (a) if the premises are *assumed* to be true, then the conclusion is *probably not true*, or (b) a probably true conclusion *does not follow from the premises*. This latter case typically occurs when the premises are simply *irrelevant* to the truth of the conclusion.

An inductive argument is **cogent** when the argument is strong and the premises are true. An inductive argument is **uncogent** if either or both of the following conditions hold: the argument is weak, or the argument has at least one false premise.

H. Reconstructing Arguments

Whenever we begin to analyze an argument, whether or not we agree with the conclusion, we should enlist the **principle of charity**. The principle asserts that we should choose the reconstructed argument that gives the benefit of the doubt to the person presenting the argument.

The principle of charity is also useful to reconstructing incomplete arguments. This type of argument is called an **enthymeme**. Enthymemes are missing a conclusion or one or more premises, or both.

There are several other types of incomplete or unclearly stated arguments and also several ways in which unclear language leads to erroneous inferences. The principle of charity is, once again, helpful in reconstructing or clarifying such arguments:

- **Rhetorical language**: Occurs when we speak or write for dramatic or exaggerated effect; when the language we employ may be implying things that are not explicitly said.
- **Rhetorical question**: Occurs when a statement is disguised in the form of a question.
- **Rhetorical conditional**: Occurs when a conditional statement is used to imply an argument.