

## Logic 03 Reading

### Section 1: The Four Statements of Logic

#### Introduction.

In the last sections we discussed the definition of **judgment** and **proposition**. We said judgment is the act by which the intellect unites by affirming or separates by denying. We also said that a proposition is the verbal expression of a judgment.

In this section, we will discuss the classification of propositions.

#### The Four Statements of Logic.

In formal logic, there are four basic categorical propositions (There are other kinds of noncategorical propositions with which formal logic deals, but we will discuss those later). The four statements take the following form:

- A:** All S are P
- E:** No S are P
- I:** Some S are P
- O:** Some S are not P

As you can see, each of these propositions is indicated by a letter. **A** stands for the first vowel in **affirmo**, the Latin word for **affirm**. That is because the **A** proposition, “All S are P,” affirms something about S; namely, that all S are P.

**I** stands for the second vowel in **affirmo**. That is because it also affirms something about S – not all S’s, but some. It says that some S’s are P’s.

**E** stands for the first vowel in the word **nego**, the Latin word for **negate**, a form of the word **negative**. That is because it doesn’t say anything affirmative about S. It doesn’t say what S is. It is negative. It says something about what S is not; namely, S is *not* P.

**O** stands for the second vowel in the word **nego**. It also says something negative about S – not all S’s, but some. It says that some S’s are not P’s.

We are using letters for the subject-term and the predicate-term in these examples. Each one of these propositions is representative of statements we use in real life. Real life examples of these statements would be the following:

**A:** All men are mortal; All cars are fast; All boys are rude; All girls are nice; etc.

**E:** No men are mortal; No cars are fast; No boys are rude; No girls are nice; etc.

**I:** Some men are mortal; Some cars are fast; Some boys are rude; Some girls are nice; etc.

**O:** Some men are not mortal; Some cars are not fast; Some boys are not rude; Some girls are not nice, etc.

### **The Quantifier.**

We said in the last chapter that propositions had three basic components: the subject-term, the predicate-term, and the copula. In each of the sentences above, you see a subject-term (S), a predicate-term (P), and a copula (the word *is* and the phrase *is **not***). But there is another component necessary in a logical proposition.

Notice that there is another word in each of the four propositions above. In addition to the subject-term, the predicate-term, and the copula there is something called a **quantifier**. In the first proposition, proposition A, the quantifier is **All**; in proposition E, the quantifier is **No**; in proposition I, the quantifier is **Some**; and in proposition O, the quantifier is **Some ...not**.

All proposition we will use in our study of formal categorical logic will have one of four kinds of quantifiers;

All  
No  
Some  
Some ...not

These quantifiers tell us important things about the propositions in which they appear. They tell us what both the **quality** and **quantity** of a proposition is. These are the two characteristics of categorical statements.

### **Quality.**

The quality of a proposition has to do with whether it is **affirmative** or **negative**. In other words, if I ask you the question, "What is the quality of this statement?" what I mean is "Is it affirmative or negative?" If we ask that question of the A proposition – if we ask, in other words, whether it is affirmative or negative – we would say, of course, that it is affirmative. It affirms, rather than denies something about the subject.

If I say, for example, "All men are mortal," we are affirming something about all men; namely, that they are mortal. Similarly, if we say, "Some men are mortal," we are affirming something

about some men' namely that they are mortal. In both of these kinds of propositions we are affirming something about the subject term **men**.

We cannot say the same about statements such as "No men are mortal," or "Some men are not mortal," since in these sentences we are not affirming anything about the subject **men**; rather, we are denying something about the subject.

The first two kinds of statements, which are A and I statements, are said to be **affirmative**. The second two kinds of statements, which are E and O statements, are said to be **negative**.

Again, whether a proposition is affirmative or negative is a question of **quality**.

### **Quantity.**

There is another characteristic about these statements that is important for logical purposes. We cannot only ask about the quality of a proposition, but also about its **quantity**. The **quantity** of a proposition has to do with whether it is universal or particular. A proposition is universal if it says something about **all** of the members of the class referred to by the subject of the proposition. A proposition is particular if it says something about only **some** members of the class referred to by the subject of the sentence.

In other words, if I ask you the question, "What is the quantity of this statement?" what I mean is, "Is it universal or particular?" If we ask that question of the A proposition – if we ask, in other words, whether it is universal or particular – we would say, of course, that it is universal. It refers to all S's, not just some.

If we say, for example, "All men are mortal," we are affirming something about all men; namely, that they are mortal. Similarly, if we say, "No men are mortal," we are denying something about all men; namely we are denying that they are mortal. In both of these kinds of propositions we are saying something about all the members of the subject-class **men**.

We cannot say the same about statements such as "Some men are mortal," or "Some men are not mortal," since in these statements we are not affirming something about all men, nor are we denying something about all men. We are affirming or denying something about only some men. These kinds of statements are said to be **particular**.

### **Distinguishing Universal Statements.**

Many statements have no quantifier. In these cases, we must try to determine, without benefit of a quantifier, whether the statements are universal or particular. For example, if we say, "Frogs are ugly," we likely have in mind the idea that **all** frogs are ugly. Therefore, we could easily rewrite such a statement to say just that: "All frogs are ugly."

The general rule for statements that do not contain a quantifier is that **all** is intended, unless **some** is clearly indicated.

If, for example, we hear someone say, "Men have gone to the North Pole," we can clearly see, even though the word **some** is not expressed in the statement, that the speaker does not really mean that **all** men have gone to the North Pole. It is pretty clear that what the statement really means is, "Some men have gone to the North Pole."

There are also statements in which the subject-term indicated is an individual. When we say, for example, "Socrates is a man," we see that the subject term is **Socrates**. Is it universal or particular? Actually, it sounds rather awkward either way: "All Socrates are men" doesn't sound like what we mean, nor does "Some Socrates are men." Neither seems to mean what we want to say.

The statement, however, is a universal, since what we wish to indicate is that every person indicated by the term **Socrates** is a man. In the statement, we are talking only about one individual. Although there may have been more than one individual name Socrates, our statement is only about one of them. The statement is universal in the sense that everyone we mean when we use the subject-term **Socrates** (which happens to be a single person), is a man. In this sense, the statement is universal. This goes for any statement in which the subject-term is the name of a person and a certain individual is meant.

### **Summary.**

We said first that there are four basic categorical propositions with which formal logic deals: "All S are P"; "No S are P"; "Some S are P"; and "Some S are not P." We noted that, in addition to the three components, the subject-term (S), the predicate-term (P), and the copula (are), there is a fourth component; the quantifier. The quantifiers are the words **All, Some, No, and Some...not**.

We said that there are two fundamental characteristics of categorical propositions; quality and quantity. Quality has to do with whether a statement is affirmative or negative. Quantity has to do with whether a proposition is universal or particular.

A and I statements are affirmative and E and O statements are negative. This is their quality. A and E statements are universal, while I and O statements are particular. This is their quantity.

We can summarize the quality and quantity of each statement as follows:

- A:** Affirmative-Universal
- E:** Negative-Universal
- I:** Affirmative-Particular

O: Negative-Particular

### Quantity and Quality of the Four Categorical Statement

		<u>Quantity</u>	
		Affirmative	Negative
<u>Quantity</u>	Universal	A	E
	Particular	I	O