Introduction to Logical Reasoning (ategorical Statements

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All men are mortal.

No lawyers are honest.

Some students are hard working.

Some professors are not lazy.

A category (or a class) is a collection or set of things.

A categorical statement makes a claim concerning the relationship between two categories of things, the subject term (S) and the predicate term (P).

The **subject** term names the main category the statement is about; the **predicate** term names the category the statement is using to say something about that subject.

A categorical proposition has the following logical form:

[Quantifier] S [copula] P.

Copula = a verb of the form "is" ["are"] or the form "is not" ["are not"].

When analyzing a categorical statement, there are three questions to ask about it:

1. Quality: Does the proposition *affirm* or *deny* some relationship between S and P?

2. Quantity: Does it refer to *all* members of *S*, or only to *some* members of *S*?

3. **Distribution:** Does it refer to *all* members of *P* or only to *some* members of *P*?

Four standard forms of categorical statements are traditionally distinguished:

- I. Universal Affirmative (\mathbf{A}) : All *S* is *P*.
- 2. Universal Negative (**E**): No S is P.
- 3. Particular Affirmative (**I**): Some S is P.
- 4. Particular Negative(\mathbf{O}): Some *S* is not *P*.

Universal Affirmative (A)

A categorical statements can be represented by a Venn diagram:

All men are mortal.

Subject (S): Men.

Predicate (P): Mortals.

So this says, All *S* is *P*.

Men Mortals

Filling it in with black means that this area is empty. So there are no men that are not also mortal.

Universal Affirmative (A)

The quality is *affirmative* because it affirms that *S*'s are also *P*'s. The quantity is *universal* because it is referring to all the *S*'s.

P is *not* distributed, however, as seen in the Venn diagram: the statement makes a claim about *some* of the *P*'s (i.e., some of those *P*'s are also *S*'s), but not necessarily about all of the *P*'s.

Universal Negative (E)

Venn diagram:

No lawyers are honest. Subject (S): Lawyers. Predicate (P): Honest people. So this says, No S is P.



». Universal Negative (E)

The quality is *negative* because it denies that S's are also P's. The quantity is *universal* because it is referring to all the S's.

P is distributed, as seen in the Venn diagram: the statement makes a claim about all of the *P*'s, because *all* of them are outside of *S*.

Particular Affirmative (I)

Some students are hard working.

Subject (S): Students.

Predicate (P): Hard workers.

So this says, Some *S* is *P*.

Venn diagram:



Particular Affirmative (I)

The quality is *affirmative* because it affirms that at least one *S* is also a *P*. The quantity is *particular* because it is only to referring to some of the *S*'s.

P is *not* distributed, as seen in the Venn diagram: the statement makes a claim about *some* of the *P*'s (i.e., at least one of those *P*'s is also in *S*'s), but not necessarily about all of the *P*'s.

».Particular Negative (O)

Some professors are not lazy.

Subject (S): Professors.

Predicate (P): Lazy people.

So this says, Some *S* is not *P*.

Venn diagram:



».Particular Negative (O)

The quality is *negative* because it denies that at least one *S* is a *P*. The quantity is *particular* because it is only to referring to some of the *S*'s.

P is distributed, however, as seen in the Venn diagram: the statement makes a claim about all of the *P*'s because *all* of them are absolutely not this *x*.

Just keep in mind, if you can draw a picture of the statement in a Venn diagram, then you can much more easily figure out its logical structure.





We will look at some slightly more complicated forms of categorical propositions.