Introduction to Logical Reasoning (ategorical Statements

David Emmanuel Gray

Northwestern University in Qatar Carnegie Mellon University in Qatar

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.

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

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

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

Four standard forms of categorical statements are traditionally distinguished:

- 1. 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*.

Juniversal Affirmative (A)

All men are mortal.

Subject (S): Men.

Predicate (P): Mortals.

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



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 *S*'s.

Juniversal Affirmative (A)

There are some slightly complex ways to express the same universal affirmative statement:

Only mortals are human. Only if it is a mortal is it a human. Mortals are the only humans. The only humans are mortals.

The words "only" and "only if" are **A**statement predicate indicators, but . . .

"the only" is an **A**statement subject indicator!

Universal Affirmative (A)

Universal affirmatives can also express what are known as **singular statements**, which are categorical statements about a single thing. For instance:

Socrates is a man.

Becomes the universal affirmative:

All persons identical with Socrates are men.

Juniversal Affirmative (A)

There are other ways to say the same universal affirmative, but these should be easier to recognize:

Men are mortals.

Every man is a mortal.

Any man is a mortal.

Whatever is a man is a mortal.

If something is a man, then it is a mortal.

». Universal Negative (E)

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 *S*'s.



Universal negatives can also express singular statements that contain a denial. For instance:

Socrates is not a lawyer man.

Becomes the universal affirmative:

All persons identical with Socrates are not lawyers.

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» Universal Negative (E)

There are other ways to say the same universal affirmative, but these should be easier to recognize: Lawyers are not honest. No one that is a lawyer is honest. None of the lawyers are honest. If anything is a lawyer, then it is not honest.

Particular Affirmative (I)

Some students are hard working.

Subject (S): Students.

Predicate (*P*): Hard working people.

So this says, Some S is P.



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 *S*.

Particular Affirmative (I)

There are many ways to say the same particular affirmative, but these are usually easy to recognize:

There are students who are hard working.

Most students are hard working.

Several students are hard working.

A few students are hard working.

At least one student is hard working.

Particular Negative (O)

Some professors are not lazy. Subject (S): Professors. Predicate (P): Lazy people. So this says, Some S is P.



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 *S*.

Particular Negative (O)

There are many ways to say the same particular negative, but these are also usually easy to recognize: There are students who are not hard working. Students are not always hard working. Many students are not hard working. A few students are not hard working. At least one student is not hard working.

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.







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We will see what we can infer from the truth of a single categorical statement. This will give us more practice using Venn diagrams.