

5.1 Standard Forms of Categorical Statements

Comment: The validity of an argument often depends on the relationships among classes, or *categories*, of things.

Definition (sorta): A *categorical statement* is a statement that relates two classes.

Definition (sorta): A *term* is a plural noun phrase that denotes a class.

Categorical Statements consist of four elements in the following order:

1. Quantifier (“All”, “No”, or “Some”)
2. Subject term
3. Copula (“are” or “are not”)
4. Predicate term

Examples of Categorical Statements

1. All logicians are exceptionally talented people.
2. No Texans are litterbugs.
3. Some politicians are prevaricators.
4. Some athletes are not users of performance enhancing drugs.

Comment: Note that terms needn't be single nouns but can be complicated noun phrases.

All [politicians who ignore the will of the people] are [oligarchists].

Some [former CEOs of major corporations who lined their pockets with the life savings of middle class investors] are [dishwashers in state prisons around the country].

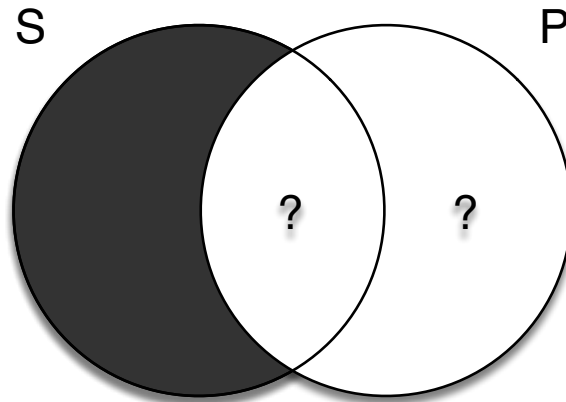
The four examples above are instances of the four *Standard Forms* of categorical statements:

Categorical Statement	Example	Standard Form
Universal affirmative	Example 1 above.	A: All S are P.
Universal negative	Example 2 above.	E: No S are P.
Particular affirmative	Example 3 above.	I: Some S are P.
Particular negative	Example 4 above.	O: Some S are not P.

The Relations These Express

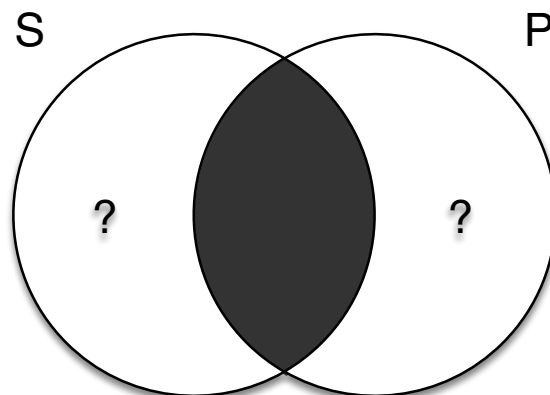
“X” indicates an object; shading lack of any objects; “?” that — **for all we know from the information conveyed** — an object might or might not be present:

- **A** statements express that S is a *subclass* of P.



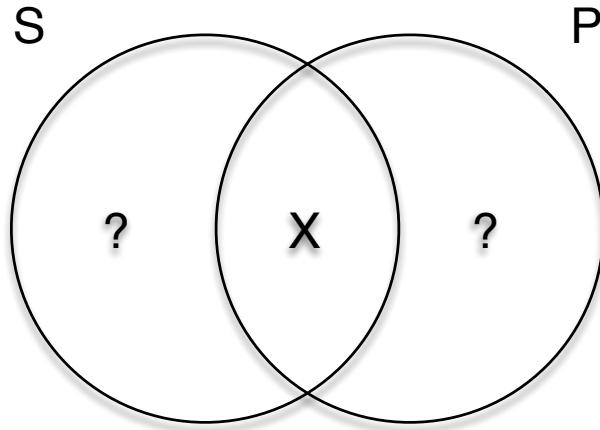
*Note: It does not follow from the fact that S is a subclass of P that S and P have any members! (Although **if** S does, then obviously P does as well.)*

- **E** statements express that S and P are *disjoint*.

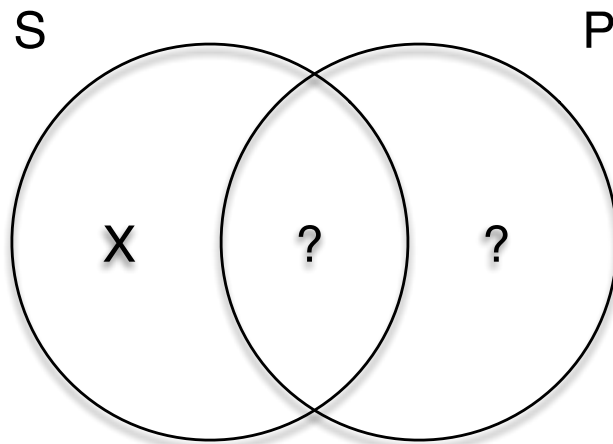


Note: It does not follow from the fact that S and P are disjoint that either S or P has any members! All we know is that share no members in common.

- **I** statements express that S and P *overlap* (i.e., that they share at least one member in common).



- **O** statements express that S and the *complement* of P (i.e., the class containing everything *outside of* P) overlap.



Quality and Quantity

Every categorical statement has a **Quality**: *affirmative* or *negative*.

Definition (sorta): A categorical statement is *affirmative* if it affirms that one class is wholly or partially included in another class. A categorical statement is *negative* if it denies that one class is wholly or partially included in another.

Comment: Statements of the form 'All S are P' and 'Some S are P' are affirmative; those of the form 'No S are P' and 'Some S are not P' are negative.

Every categorical statement has a **Quantity**: *universal* or *particular*.

Definition (sorta): A categorical statement is *universal* if it says something about all the members of a class. A categorical statement is *particular* if it only says something about some of the members of a class.

Comment: Statements of the form 'All S are P' and 'No S are P' are universal; those of the form 'Some S are P' and 'Some S are not P' are particular

Putting Categorical Statements into Standard Form

1. Many ordinary language sentences express categorical statements incompletely with adjectival phrases. *Solution:* Substitute an appropriate (possibly complex) noun phrase for the adjectival phrase.

Some politicians are unethical. (With noun added: Some politicians are unethical people.)

All women are wiser than all men. (Rewrite: All women are persons who are wiser than all men.)

2. Sometimes the elements of a standard form statement are all present but are in the wrong order. *Solution:* Simply rearrange them.

Rubies are all gems.

3. Some ordinary language sentences express categorical statements with verbs other than the copula 'are'. *Solution:* Rewrite with 'are', introducing an appropriate noun phrase to preserve the meaning.

All fish swim. (Rewrite: All fish are swimmers or All fish are creatures who swim.)

No politicians who ignore the will of the people will be re-elected. (Rewrite: No [politicians who ignore the will of the people] are [politicians who will be re-elected].)

4. A categorical statement can be expressed in any of several *stylistic variants*. *Solution*: Rewrite the variants in standard form.

All S are P.

Every S is a P.

Each S is a P.

Any S is a P.

If anything is an S, then it is a P.

S are P.

Only P are S.

No S are P.

No S is a P.

Nothing that is an S is a P.

There are no S that are P.

If anything is an S, then it is not a P.

Nothing is an S unless it is not a P.

A thing is an S only if it is not a P.

Some S are P.

Some S is a P.

At least one S is a P.

There is (exists) an S that is a P.

Something is both an S and a P.

Not every S is not a P.

Some S are not P.

Some S is not a P.

At least one S is not a P.

There is an S that is not a P.

Something is an S but not a P.

Not every S is a P.