

Negation doesn't deny predicate itself
but the relation between
subject & predicate.

syllogism

-> standardize the rules of natural language

Syllogism = A type of logical argument that uses multiple propositions to arrive at a conclusion/inference.
or infer

A typical syllogism is the one in which a conclusion is drawn from two premises.

For our sake, syllogism is a form of deductive reasoning in which conclusion/inference is deduced on the basis of two premises.

$P_1 =$ All humans are mammals
 $P_2 =$ All mammals are organisms
Con = Therefore, all humans are organisms

There are various types of syllogisms:

Terminology = There are names of these
three propositions and three terms

Describing propositions through terms:

One of the premises is called the Major Premise. It contains the major term and the middle term.

The other premise is called the Minor Premise. It contains the minor term and the middle term.

The inference is called the Conclusion. Its subject is minor term and predicate is major term.

Describing the terms through propositions:

Major Term = Appears in major premise

Minor Term = Appears in minor premise

Middle term = (i) Appears in both the premises (ii) but does not appear in conclusion

We are dealing with categorical syllogisms

(i) premises & conclusion are categorical propositions

3 subjects
& 3 predicate \Rightarrow ^{obem} Three - 2 premises & 1 conclusion

(ii) Three categorical terms \rightarrow each appearing twice in syllogism

(like transitivity)
but it may not actually be transitive

major premise \neq major term

All mammals are organisms }
 All humans are mammals } transitively
 \therefore All humans are organisms }

(1) In premises, we connect the major and minor terms with a common middle term

What we are trying to do is that:

(i) In premises, we connect the major and minor terms with a common middle term.

(ii) In conclusion we discard the middle term and show a relationship between a major and minor term.

Conclusion = Minor ---- Major

If a certain portion of A is related to certain portion of B, and certain portion of C is related to certain portion of B, can we say that certain portion of A is related to certain portion of C?

If A-B and C-B, then A-C?

Tip: It is handy to identify the conclusion first. Its subject helps to identify the minor premise and predicate helps to identify the major premise.

In premises, we connect the major and minor terms with a common middle term

In conclusion we discard the middle term and show a relationship between major and minor term.

Conclusion = Minor --- Major

There are 4 types of categorical propositions:
A, E, I, O

There are four types of categorical propositions: A, E, I and O-types.

Categorical syllogisms contain three propositions (2 premises, 1 conclusion).

How many unique types of categorical syllogisms are possible?
ANSWER.

$$4 * 4 * 4 = 64$$

e.g. AAA, AAE, AAI, AAO, etc.

The shade of your syllogism due to the type of propositions are called moods of syllogisms

Mood = Classification of categorical syllogism according to the form of categorical propositions it contains.

No heroes are cowards

E

(you can switch the subject & predicate)

Some soldiers are cowards

I

Therefore some soldiers are not heroes

O

(no freedom)

Another way to classify categorical syllogisms is **figure**.

Figure is the form of a syllogism determined by the position of the middle term in the premises.

There are 4 types of Syllogisms depending on where it occurs in the major and minor premises

(1) First figure = Subject of major premise, and the predicate of minor premise

Logic skeleton of categorical syllogism will look like this:

∴

Subject of Conclusion = Minor Term = S

Predicate of Conclusion = Major Term = P

Middle Term = M

(1) Major Premise: M-P

Minor Premise S-M

Conclusion: ∴ S-P

M-P
S-M

∴ S-P

(2) Second figure - Predicate of both

P-M
S-M

∴ S-P

(3) Third figure → Subject of both

$$\begin{array}{c} M-P \\ M-S \\ \hline \therefore S-P \end{array}$$

Predicate of major
subject of minor

$$\begin{array}{c} P-M \\ M-S \\ \hline \therefore S-P \end{array}$$

Why worry about mood & Figure?!

Syllogisms with the same mood and figure also have the same validity.

All boys are males Mid-Pred
All boys are humans Mid-Subj
Therefore all humans are males 40 Subj-Pred
[M = boys; S = humans; P = males]

Form AAA-3 figure=3 invalid

Some can say that AAA-3 arguments are invalid!

AAA-3

Natural language arguments may not always be in syllogistic form. But they can be broken down into syllogistic forms.

1. Identify the conclusion first.
2. Subject of the conclusion is minor term. Predicate of conclusion is the major term.
3. Premise containing the major term is the Major Premise. The other term is middle term.
4. Premise containing the minor term is the Minor Premise. The other term is middle term.
6. Identify the figure. 1 = MP SM; 2 = PM SM; 3 = MP MS; 4 = PM MS

Man is mortal
Whoever is man is not a woman
∴ woman is not mortal
Problem?

Man is used in 2 different senses
fallacy

4 terms

Man is on Earth

All plants are on Earth

⇒ All Martians

are on Earth

Avoid 4 terms

Fallacy of 4 terms!

Rule 1. Avoid four terms

Categorical syllogisms contain only three terms: Subject (minor), predicate (major) and middle term.

There should not be any more or less terms.

The meaning of the terms should not change. If the meaning changes, then more than three terms have been introduced.

The fallacy of four terms = Fallacy committed when more than three terms are involved.

remember these

Rule 2 next class

