#### Introduction to Logical Reasoning (ategorical Syllogisms

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## Categorical Syllogisms

A categorical syllogism is an argument involves exactly three categorical statements (two premises, and one conclusion) which have a special form involving only three categories in total.

## A Categorical Syllogism

Some writers are mediocre hacks, but no great journalists are mediocre hacks. As a result, some writers are not great journalists.



There are two premises here, but *I have not yet numbered them*. There is a special way for numbering the propositions in a categorical syllogism that I will explain shortly.

#### Some Technical Definitions

The **major term** (P) of a categorical syllogism is the predicate of the conclusion.

The **minor term** (S) of a categorical syllogism is the subject of the conclusion.

The **middle term** (M) of a categorical syllogism is the term appearing in both premises but not in the conclusion.

## Standard Symbolic Form

Now we can put the argument into what I call standard symbolic form.

To do this, **first** identify the major, minor, and middle terms of the argument:

Major term (P): Great journalists.

Minor term (S): Writers.

Middle term (M): Mediocre hacks.

#### Standard Symbolic Form

**Second**, we number the premises of the argument: Premise 1 is always the categorical premise that has the *major* term (P) in it. This is the **major premise**. Premise 2 is always the categorical premise that has the *minor* term (S) in it. This is the **minor premise**.



#### Standard Symbolic Form

**Third**, symbolize the argument using these identifiers for the major, minor, and middle terms:

- I. No P is M.
- 2. Some S is M.
- $\therefore$  Some *S* is not *P*.

Putting the argument in this form will now make it much easier to check its validity.

## The Mood of a Syllogism

The mood of a categorical syllogism expresses the three standard-form categorical propositions that it contains. Therefore the mood consists of three letters: premise 1's form, premise 2's form, and the conclusion's form.

## The Mood of a Syllogism

1. No P is M.[An E statement.]2. Some S is M.[An I statement.] $\therefore$  Some S is not P.[An O statement.]

In this example, the mood is **EIO** because premise 1 is an **E** statement while premise 2 is an **I** statement, and the conclusion is an **O** statement.

Yes, the order of the letters matters. Premise 1 is first, premise 2 is second, and the conclusion is third.

# The Figure of a Syllogism

The **figure** of a categorical syllogism represents the syllogisms logical shape, which is determined by the position of the middle term in the premises. There are only four possible figures:

 $M - P \qquad P - M \qquad M - P \qquad P - M \qquad \\ \begin{array}{c} M - P \\ S - M \end{array} \qquad S - M \qquad M - S \qquad M - S \qquad \\ M - S \qquad M - S \qquad \\ \end{array}$ first figure second figure third figure fourth figure

## The Figure of a Syllogism

In the example, the middle term is the predicate of both premise 1 and premise 2 is seen as being like so:

- 1. No P is M. 2. Some S is M.
- Hence this categorical syllogism has figure 2.

## The Form of a Syllogism

Any syllogism can be categorized by its **form**, which is simply the syllogism's mood, followed by a hyphen, followed by the syllogism's figure.

For instance, the example has the form of **EIO-2**.

#### Eorm and Validity

It turns out that the logical form of a syllogism (three letters and a number) is sufficient to determine the validity of a categorical syllogism.

In fact, form **EIO-2** is logically valid, and logicians have given this form a Latin name: *Festino*.

#### Validity by Memorization The complete list of all valid categorical syllogisms: AAA-I Barbara AEE-2 Camestres AII-3 Datisi AEE-4 Camenes EAE-I Celarent EAE-2 Cesare IAI-3 Disamis IAI-4 Dimaris AII-I Darii AOO-2 Baroko EIO-3 Ferison **EIO-4** Fresison EIO-I Ferio **EIO-2** Festino **OAO-3** Bokardo

Any syllogism *not* on this list is immediately invalid.



Is the following syllogism valid or invalid? Some journalists are mediocre hacks, but all failures are mediocre hacks. As a result, some journalists are not failures.



## Argument 1 (The Terms)

Major term (P): Failures, Minor term (S): Journalists, and

Middle term (M): Mediocre hacks.





1. All P is M. 2. Some S is M.  $\therefore$  Some S is not P.

## Argument 1 (Mood)

All *P* is *M*.
Some *S* is *M*.
∴ Some *S* is not *P*.

[An A statement.] [An I statement.] [An O statement.]

Mood: **AIO**.









Is the following syllogism valid or invalid? Some clever people are journalists, and all clever people are hard workers. As a result, some journalists are hard workers.



## Argument 2 (The Terms)

Major term (P): Hard workers, Minor term (S): Journalists, and Middle term (M): Clever people.





1. All M is P. 2. Some M is S.  $\therefore$  Some S is P.

## Argument 1 (Mood)

1. All M is P.2. Some M is S. $\therefore$  Some S is P.

[An A statement.] [An I statement.] [An I statement.]

Mood: **AII**.







It is *valid* because **AII-3** is *Datisi*, a valid form.

#### ».Next Class..

We will learn how to use Venn diagrams to assess the validity categorical arguments. This is a much better way for checking validity, though the memorization method remains a good way to check your work.