

Philosophy 104

Chapter 7.1 Notes

A new kind of argument:

All men are mortal

Socrates is a Man

Socrates is mortal

How does one translate this into chapter 6 (propositional) logic?

Well, each premise and the conclusion seem to express a different and single proposition, so:

A new kind of argument:

All men are mortal

Socrates is a Man

Socrates is mortal

p

q

r

Problem:

- But the argument form comes out invalid, when the argument itself is as clearly valid as anything!
- This is because the sentences in the argument contain *quantifiers*. This supplies us with two choices:

Predicate Logic:

- Socrates is a man:

$$(\forall x)(Sx \supset Mx)$$

In this case, truth tables stop being practical and you must learn a new method of determining validity.

Aristotle's Categorical Logic

- Socrates is a man:

All things that are Socrates are men

Arguments with sentences put into one of four categorical forms (next slide) can be evaluated just as they are with one of a couple simple methods.

Categorical Forms (there are only four ways of putting things into categories):

	Affirmative	Negative
Universal	A: All S are P	E: No S is P
Particular	I: Some S is P	O: Some S is not P

Translation into categorical form

- ‘S’ will generally be short for ‘subject’ and ‘P’ will be short for ‘predicate’.
- S and P will both have to turn into plural noun phrases so that each circle on our diagrams will represent a class of things.
- Claims about individuals can be made into plural noun phrases by adding a phrase like “persons identical with” or “things identical with”, etc.
- Adjectival or verb phrases can be made into noun phrases by addition of phrases like “things that...”. For example, “everything green goes ‘splat’” turns into “All green things are things that go splat.”

Translation into A claims

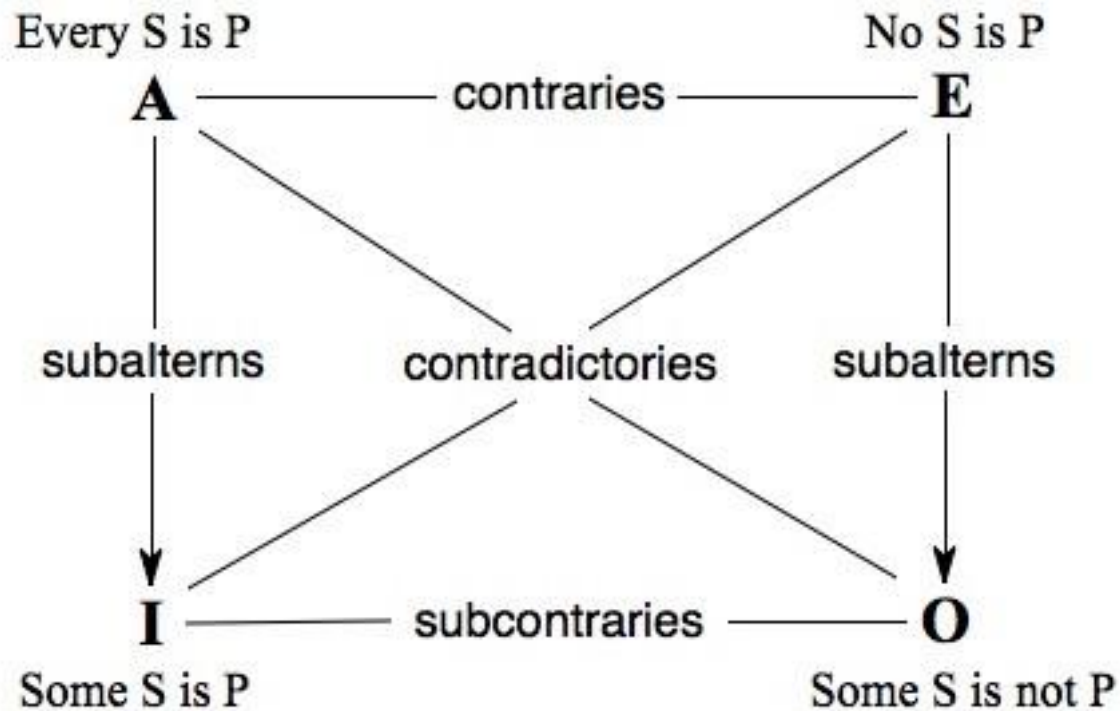
- Every S is P
- Any S is P
- Anyone S is P
- Each S is P

All of these go
straight into the
form: All S are P

Only the only

- “Only x are y” translates to “All y are x”. ‘Only’ indicates the predicate of an A claim.
- “x are the only y” translates to “All y are x” because ‘the only’ indicates the subject of an A claim

Square of Opposition



Contradictories

- It is easy to see from diagrams that E and I claims contradict one another, that is, they cannot have the same truth value at the same time. The same holds for the A and O claims.

Contraries and Subcontraries

- Contrary claims cannot both be true (but can both be false).
The A and E claims are contrary.
- Subcontrary claims cannot both be false (but can both be true). The I and O claims are subcontrary.

Syllogism

- A syllogism is an argument made up entirely of categorical claims
- There are 2 and only 2 premises and one conclusion
 - Major premise: contains the predicate term
 - Minor premise: contains the subject term
- There are 3 and only 3 terms in a syllogism.
 - Predicate term: predicate of the conclusion
 - Subject term: subject of the conclusion
 - Middle term: term that is not in the conclusion, but is in each premise

Validity for Syllogisms

- Validity means the same thing it always has. IF the premises are true, then the conclusion must be.
- To determine if a syllogism is valid, we make a Venn Diagram with three circles and then diagram the premises. If the information given by the conclusion is represented by diagramming the premises, then the premises guarantee the conclusion, and the argument is valid.

(Just for fun) The old method

- Sort syllogisms into FIGURES:
 - Figure 1: The middle term is the Subject of the Major premise, and the Predicate of the Minor premise
 - Figure 2: The middle term is the Predicate in both premises
 - Figure 3: The middle terms is the Subject of both premises
 - Figure 4: The middle term is the Predicate of the Major premise, and the Subject of the Minor premise

(Just for Fun) The old method

- Memorize the following chant:
 1. Barbara, Celarent, Darii, Ferio
 2. Cesare, Camestres, Festino, Baroco
 3. Darapti, Disamis, Datisi, Felapton, Bocardo, Ferison
 4. Bramantip, Camenes, Dimaris, Fesapo, Fresison
- Here's how to decode:
- **B a r b a r a** is a syllogism with A claims for major premise, minor premise, and conclusion and is valid for figure 1 syllogisms.
- **F e l a p t o n** is a syllogism with an E major premise, and A minor premise, an O conclusion, and is valid for figure 3 syllogisms.

Venn Diagram Method:

1. Draw three circles in the appropriate way
2. Label each circle in the appropriate way
3. Diagram the premises
4. If any area is the only un-shaded area of its circle, put a * in it. (existential commitment) After this, put your pen/pencil down.
5. Check if the information given by the conclusion is or is not represented on the diagram. If it is, the argument is valid, if not, the argument is not valid.

Note about the *

- When the * could go in one of two areas on a three-circle Venn Diagram, it must go on the line between them to indicate that the * is in one of the two areas, but that the premises do not specify which.
- The information that this conveys is NOT that there is a * in both areas, nor neither.
- See p.171-2