Chapter 9: Deductive arguments I

Categorical claims

Categorical logic: The way which humans make claims about classes of things

Categorical claims
They have a subject and a predicate (verb).
First space is the subject of the claim, second space is the predicate of the claim

- Categorical **A** and **E** claims are universal claims

These two claims are universal claims because they talk about all the members of that class.

A-claim: All _____ are_____
E-claim: All_____are not_____

The second type of a categorical claim is a particular claim.

Particular claims talk about some members of a class.

- These are **I** and **O** claims.

I-claim: Some____are____
O-claim: Some____are not____

A claim. All members of a class are

A. **All** wolves **are** mammals
Another example: **All** humans **are** mortal

B. **E claim. No members of a class are**
E. **No** lizards **are** mammals
Another example: **No** dragons **are** alive

C. **I claim. Some members of the class**
Example: Some sea creatures are mammals

D. **O claim. Some members are not**
Example: Some mammals are not sea-creatures

Affirmative claim: Something is something (**A** and **I**)
Negative claim: Something isn't something (**E** and **O**)

The word **only** used by itself introduces the predicate term of an A claim
Only Barca fans are logical -> All Barca fans are logical

The only introduces the subject of the A claim

- Example:The only logical fans are Barca fans -> Same thing

Top part: Both parts can't be true (A-claims and E-claims can't both be true)
Bottom part: Both can't be false (I-claims and O-claims can't both be false)

Conversion: Switch position of the subject and predicate terms
No Norwegians are slaves.
No slaves are Norwegian.

- Only works on E and I claims.

Obversion: We have to change the claim from positive to a negative and go horizontal on the square. Change from a positive to a negative (vice versa) and use complementary term on predicate.
All Presbyterians are Christians
No Presbyterians are non-Christians

- Works on all terms.

Contraposition: Flipping around the subject and predicate of a term and replace both with a complementary terms.
All Mongolians are muslims
All non muslims are non Mongolians

Some citizens are non-voters
Some non-voters are non-citizens

- Only works for A and O terms.

Obversion
Some Arabs are Christians
Some Arabs are non Christians

Contraposition
Some Indians are not Hindus
Some Hindus are not Indians
All catholics are Christians
All non Christians are catholics

Conversion
All protestants are Christians
All Christians are not protestants.

Some basic ways we can turn these into an argument

Categorical syllogism: an argument using categorical claims

We don't just have subject and predicate; we have a third entity in equation.

1. All Americans are consumers
2. Some consumers are not democrats.

All A are C

some C are not D

Some A are not D

3. Some Americans are not democrats

Major term the term that is the predicate of the conclusion.

Minor term is the subject of the conclusion

Undistributed middle is a fallacy having to do with categorical syllogism

There has to be a middle term. The term that occurs twice is the 2 premises of the categorical syllogism. It is doing the work.

We use the venn diagram test to test validity.

Translation rules

Conversion

-Switches the subject term and the predicate term

1. All A are B
2. All B are A

1. No bach are married men
2. No married men are bachelors

Only works on E and I claims

Obversion

- Change quality (affirmative to negative) All are, None are
- Change predicate to compliment (patriots, non patriots)

1. No fish are mammals
2. All fish are non mammals

Works for all four claims (A, E, I, O)

<u>Contraposition</u>

1. Switch subject term and predicate term
2. Replace both terms with compliments

1. All a are b
2. All non b are non a

1. All dogs are animals

2. All non animals are non dogs

This only works for A and O type arguments

Be careful of the word only
Only always introduces the predicate
The only introduces the subject

(p 248)

Categorical syllogism

1. All soldiers are patriots
2. No traitors are patriots

C. Therefore, no **traitors** (minor) are **soldiers** (major)

The premises must necessitate the conclusion

Whoever whenever anyone (All A statements)
Never no one (All E statements)
A few (I statements)
If A then B, If then (Universal A statements)
The only means all (Also an A statements)

Chapter 10: Deductive Arguments II (Truth-functional logic)

Propositional logic
The reduction of real life arguments to symbolic form. (All, none and some are quantifiers)
Letters now stand for claims and not classes of things. We're connecting claims instead of individual pieces.
Different connectors now. (**And** and **or** are logical operators **Neither, If then**)
The claims that we're connecting are going to be designated upper case Ps and Qs.

1. It is not the case that L -L (**Negation**)
2. K and S K&S (**Conjunction**)
3. Either S or W S v W (**Disjunction**)
4. If W then P W->P (**Conditional**)

- The first claim in a conditional is the antecedent and the second is the consequent.

Two claims are truth functionally equivalent if they have exactly the same truth table.

The word “if” used alone introduces the antecedent of a conditional. The phrase “only if” introduces the consequent of a conditional.

Negation (-): “Not” or “It is not the case”
Conjunction (&): “and”, “but”, “while”
Disjunction (V): “or”, “unless”
Conditional (->): “if then”, “provided that”

Group I rule

Modus Ponens: Affirming the antecedent
Modus Tollens: Denying the consequent
Chain argument:

P -> Q
Q -> R
P->R

Disjunctive argument:

P V Q
-P
Q

P V Q
-Q
P

Simplification:

P & Q
P

P & Q
Q

Conjunction:

P
Q
P & Q

Addition:

P
P V Q

Q
P V Q

Constructive Dilemma:

P -> Q
R -> S
P V R

Q V S

Destructive Dilemma:

P -> Q

R -> S

<u>-Q V -S</u>

-P V -R

Chapter 11:

Argument from analogy: is an argument that something has an attribute because a similar thing has that attribute

- Example: Bill likes hunting
  Therefore his brother Sam likes hunting

The **analogues** are bill and sam
The **conclusion-analogue** (sam) is argued to have the **attribute of interest** (like hunting) because the **premise analogue** (bill) is said to have it

A **Contrary Premise Analogue** is a premise analogue that does not share the attribute of interest.

Attacking the analogy is the time honoured strategy for rebutting an argument from analogy-showing that the premise analogue or analogues are not as similar to the conclusion analogue as stated or implied.

The Fallacy known as **weak analogy** is a weak argument based on a debatable or unimportant similarities between two or more things.

Three Arguments from Analogy:

- Cheryl and Denise are teenage sisters. They attend the same school, watch the same TV shows, like the same music and Youtube videos, and have many friends in common. Therefore, Denise will like Superman movies.
- We co-existed with the former soviet union when it had nuclear weapons. Therefore, we can co-exist with Iran, should it obtain nuclear weapons.
- Rollerblading is very much like skiing. I am good at rollerblading. Therefore I will be good at skiing.

You **Generalize from a sample** when you reason that all, most, or some percentage of the members of a population have an attribute because, all, most, or some percentage of a sample of the population have that attribute. A “population” is any identifiable group of things.

Example: So far, I’ve liked every one of Professor Stoolers lectures.
Therefore I will like all of his lectures

- In this example, the *population* consists of Stoolers lectures I will hear. All members of this population are argued to have the *attribute of interest* because all members of the *sample* of them have that attribute.

An **atypical (biased) sample** is one that does not mirror or represent the overall population. It is one in which an important variable or disproportionately present or absent.

The more atypical the sample, the weaker the generalization

Our best bet in everyday generalizing is to try to make the sample from which we generalize as **diversified** as possible.

- The less diversified the sample, the weaker the generalization.
- Generalizations based on samples too small to accurately mirror the overall population are relatively weak.

Three arguments that generalize from a sample:

- There aren't any silverfish in this motel room; therefore, there aren't any silverfish anywhere in Lodi
- I don't like jane; others probably feel the same.
- OMG! Look at this rash! Ill steer clear of this kind of plant next time.

Scientific generalizing from a sample

A **statistical syllogism** applies a general statement to a specific case.

- Example:
  Most teachers are Democrats.
  York is a teacher.
  Therefore York is a Democrat.
- This walks like a duck, talks like a duck, and looks like a duck. Therefore, it is a duck.

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