CHAPTER FIVE
PROPOSITIONAL ARGUMENTS

Simple and compound statements

Compound statement forms and truth conditions

Propositional arguments

Propositional fallacies

SIMPLE AND COMPOUND STATEMENTS

Simple statements: Statements that make **one single claim**.

- They do not contain any other statement.

Compound statements: Statements that **contain at least one other statement.**

There are four main kinds of compound statements:

- Negations
- Disjunctions
- Conjunctions
- Conditionals

NEGATIONS

- A negation is a compound statement that **denies another statement**.
- The form of a negation is:

  Not S1.

- A negation **is true when the statement it contains is false**.
- S1 = True
- Not S1 = False

DISJUNCTIONS

- Disjunctions are compound statements with the following form:

S1 **or** S2

- S1 and S2 are called disjuncts.
- Some disjunction indicators: or, unless, any one of.

- A disjunction is **true when at least one of the disjuncts is true**.
- If both disjuncts are false, the disjunction is false.

INCLUSIVE AND EXCLUSIVE DISJUNCTIONS

- A disjunction is **inclusive** when **both disjuncts can be true**:

  S1 or S2 (or both)

- A disjunction is **exclusive** when **only one of the disjuncts can be true**:

  S1 or S2 (but not both)

CONJUNCTIONS

- Conjunctions are compound statements with the following form:

  S1 **and** S2

- S1 and S2 are called conjuncts.
- Some conjunction indicators: and, but, event though, nevertheless, although, still.

- A conjunction is **true when all of its conjuncts are true**.
- If at least one conjunct is false, the conjunction is false.

CONDITIONALS

- Conditionals assert that **if one statement is true, then the other statement is true**.
- The form of a conditional is:

If S1, then S2.

- The "if" statement is called the **antecedent**.
- The "then" statement is called the **consequent**.

- Besides the words if and then, punctuation helps identifying conditionals (usually, a comma separating antecedent and consequent).
- Other conditional indicators: provided that, implies that, given that, so, therefore…

- A conditional is **true when the antecedent is false or the consequent is true**.
- A conditional is **false only when the antecedent is true and the consequent is false**.

THREE COMPLICATIONS ABOUT CONDITIONALS

- The order of the statements is not relevant. Sometimes the consequent can be placed before the antecedent.

  "You won't catch your flight if you don't run"

- Sometimes there is no "then" indicating the consequent:

  "If I miss my flight, I will die"

- The phrase **"only if" indicates the consequent** of the conditional, NOT THE ANTECEDENT.

  "Only if you get up early will you be able to be at the airport on time"

  This statement is making the following claim:

  "If you are at the airport on time, then you got up early"

"Only if" indicates a necessary condition.

"ONLY IF" AND NECESSARY CONDITIONS

Consider the following statement form:

If S1, then S2

S2 is a necessary condition for S1.
This means that S1cannot happen without S2 happening as well. S2 is a logical consequence of S1.

The latter statement form is thus equivalent to this:

S1 only if S2

Back to the example:

"If you are at the airport on time, then you got up early"

This statement makes the claim that it cannot happen that you are at the airport on time without you getting up early.

- In other words, getting up early is a necessary condition for you to be at the airport on time.
- In other words, you will be at the airport on time only if you get up early.

TEN PROPOSITIONAL ARGUMENT FORMS

VALID FORMS:

- Denying a disjunct
- Affirming an exclusive disjunct
- Affirming the antecedent
- Denying the consequent
- Tri-Conditional

INVALID FORMS/FALLACIES:

- Affirming an inclusive disjunct
- False dichotomy
- Denying the antecedent
- Affirming the consequent
- Begging the question

DENYING A DISJUNCT

An argument denies a disjunct when **one premise is a disjunction**, and the other premise states that **one of the disjuncts is false**. It follows that **the other disjunct is true**.

There are four forms for this type of argument:

<u>For inclusive disjuction</u>:

(1) S1 or S2 (or both).
(2) Not S1.
Therefore,
(3) S2.

(1) S1 or S2 (or both).
(2) Not S2.
Therefore,
(3) S1.

<u>For exclusive disjunction</u>:

(1) S1 or S2 (but not both).
(2) Not S1.
Therefore,
(3) S2.

(1) S1 or S2 (but not both).
(2) Not S2.
Therefore,
(3) S1.

Aka: Disjunctive Syllogism

FALLACY: AFFIRMING AN INCLUSIVE DISJUNCT

When a disjunction is inclusive, affirming a disjunct is an invalid form.

Hence, the following forms are invalid:

(1) S1 or S2 (or both).
(2) S1.
Therefore,
(3) Not S2.

(1) S1 or S2 (or both).
(2) S2.
Therefore,
(3) Not S1.

This is wrong because in inclusive disjunctions, both disjuncts can be true.
Hence the fact that one disjunct is true is no evidence for the falsity of the other one.

AFFIRMING AN EXCLUSIVE DISJUNCT

When a disjunction is **exclusive, affirming a disjunct is a valid form**.
This is because in an exclusive disjunction, only one disjunct can be true.

Hence, the following forms are valid.

(1) S1 or S2 (but not both).
(2) S1.
Therefore,
(3) Not S2.

(1) S1 or S2 (but not both).
(2) S2.
Therefore,
(3) Not S1.

Determining whether a disjunction is inclusive or exclusive is a matter of **context**.

FALLACY: FALSE DICHOTOMY

False dichotomy is not about the form of an argument, but rather about its content.

It occurs when a disjunction presented in an argument is false because there are other alternatives besides the two presented in the premise.

For instance:

(1) Either it is hot, or it is cold in Syracuse.
(2) It is not hot in Syracuse
Therefore,
(3) It is cold in Syracuse.

Hot-cold is a false dichotomy.
For instance, it could be warm in Syracuse.

AFFIRMING THE ANTECEDENT

In an argument that affirms the antecedent, **one premise is a conditional** and another premise **affirms the antecedent of the conditional**.
The **conclusion affirms the consequent of the conditional**.

This is the form of the argument:

(1) If S1, then S2.
(2) S1
Therefore,
(3) S2.

Aka: Modus Ponens

FALLACY: DENYING THE ANTECEDENT

One premise is a conditional, and another premise denies the antecendent of the conditional.
The conclusion is the negation of the consequent.

(1) If S1, then S2.
(2) Not S1
Therefore,
(3) Not S2.

This form is invalid.
Given S1, S2 has to be true.
But we do not know nothing about what happens to S2 when S1 does not obtain.
S2 could still obtain even if S1 does not.

DENYING THE CONSEQUENT

In an argument that denies the consequent, **one premise is a conditional** and the other **premise denies the consequent of the conditional**.
The **conclusion is the negation of the antecedent**.

This is the form of the argument:

(1) If S1, then S2.
(2) Not S2.
Therefore,
(3) Not S1.

Aka: Modus Tollens

FALLACY: AFFIRMING THE CONSEQUENT

In this form, one premise is a conditional, and the other premise affirms the consequent of the conditional.
The conclusion affirms the antecedent of the conditional.

(1) If S1, then S2
(2) S2
Therefore,
(3) S1.

This is an invalid form.
The consequent might obtain even if the antecedent doesn't.
Hence, from the obtaining of the consequent you are not entitled to infer the obtaining of the antecedent.

TRI-CONDITIONAL

A tri-conditional argument has **two conditional premises, and a conditional conclusion**.

The form of the argument is the following:

(1) If S1, then S2
(2) If S2, then S3
Therefore,
(3) If S1, then S3.

The conclusion is formed with the antecedent of one conditional and the consequent of another conditional.

Aka: Hypothetical Syllogism

FALLACY: BEGGING THE QUESTION

Occurs when **a premise of an argument asserts the conclusion of the argument**.

The form of this type of argument is the following:

(1) S
Therefore,
(2) S.

Often, the conclusion of a statement is not explicitly asserted in the premises, but is rather presupposed.

Arguments that beg the question are not really arguments, because they contain only one statement.

They are assertions that look like arguments.