5.3 Immediate Inferences

Definition (sorta): An inference is *immediate* if the conclusion of the inference is drawn from only one premise. (This is from Section 5.2.)

Conversion

Definition: The *converse* of a standard form categorical statement is the result of interchanging its subject and predicate terms.

Examples

Form	*Statement*	*Converse*
A	All dogs are animals.	All animals are dogs.
E	No plants are animals.	No animals are plants.
I	Some plants are trees.	Some trees are plants.
O	Some plants are not trees.	Some trees are not plants.

Definition: *Conversion* is the (immediate) inference from a categorical statement to its converse.

Conversion is valid for **E** *and* **I** *statements, invalid (in general) for* **A** *and* **O** *statements.*

Comment: In fact, **E** and **I** statements are *logically equivalent* to their converses, that is, each can be validly inferred from the other.

Comment: Note there are some valid *instances* of A and O conversion, e.g., "All squares are equilateral rectangles". The point is that valid conversion from an A or O statement is not *guaranteed* for *any* instance, and hence we say that the *pattern* of conversion is invalid for A and O statements.

Obversion

Definition: The *complement* of a class X is the class of all things that are not members of X.

<u>Example</u>

The complement of the class of humans is the class of all nonhumans, and so would included, e.g., plants, horses, numbers, telephones, etc.

Definition (sorta): The *term-complement* of a term of the form 'non-X' is X; that of a term X not of the form 'non-Y' is 'non-X'.

Comment: The term-complement of 'X' denotes the complement of the class denoted by 'X'. Thus, the complement of the class of dogs is the class of non-dogs, and vice-versa.

Definition: The *obverse* of a standard form categorical statement is the result of (i) changing its quality (from affirmative to negative or vice versa) and (ii) replacing the predicate term with its term-complement.

<u>Examples</u>

Form	Statement	Obverse
A	All trees are plants.	No trees are non-plants.
E	No cats are trees.	All cats are non-trees.
I	Some trees are oaks.	Some trees are not non-oaks.
O	Some trees are not oaks.	Some trees are non-oaks.

Definition: *obversion* is the inference from a categorical statement to its obverse.

Obversion is always valid.

Contraposition

Definition: The *contrapositive* of a standard form categorical statement is the result of (i) replacing its subject term with the term complement of its predicate term and (b) replacing the predicate term with the term-complement of its subject term.

Examples

Form	Statement	Contrapositive
A	All cats are mammals.	All non-mammals are non-cats.
E	No bats are elephants.	No non-elephants are non-bats.
I	Some plants are weeds.	Some non-weeds are non-plants.
O	Some plants are not weeds.	Some non-weeds are not non-plants.

Definition: *contraposition* is the inference from a categorical statement to its contrapositive.

*Contraposition is valid for **A** and **O** statements, invalid (in general) for **E** and **I** statements.*

Comment: As with conversion, there are valid *instances* of **E** and **I** contraposition, but the *pattern* in general does not guarantee validity for all such statements.

A Simple Mnemonic

- For the rules starting with "C", look at the vowels in the Center:

  - Conv**E**rs**I**on is valid in general for **E** and **I** statements only.
  - Contr**A**p**O**sition is valid in general for **A** and **O** statements only.

- **O**bversion, being the **O**dd rule, is valid for *all* statements.