

## LOGICAL REASONING Fallacies

**Fallacy:** Flaw (Error) in logical reasoning.

### FORMAL FALLACIES

1) **Fallacy of four terms** (*quaternio terminorum*)

If there are 4 terms in a categorical syllogism instead of exactly 3 terms, then the syllogism is invalid (flawed).

(Note: A categorical syllogism has two premises, one conclusion and altogether 3 terms. Each term repeats exactly twice, including premises and conclusion).

Example:

Premises:

All sheep are silky

Some cloths are smooth

Conclusion:

Some smooth are sheep

This case we have total 4 terms (Sheep, Silky, Cloths, Smooth) and syllogism is NOT valid. Syllogism is flawed.

2) **Fallacy of undistributed middle term:**

Middle term must be distributed in at least one of the premises.

Example:

Premises:

All cats are dogs

Some dogs are small

Concl:

Some small are cats

('Dogs' is the middle term and it is NOT distributed in both premises. So, the syllogism is flawed).

Notes:

**Middle term:** It is the common term in two premises (Here it is DOG)

**Distribution:** Distributed terms in each categorical premises are **underlined** below.

1) All cats are dogs (Subject (first term) is distributed in 'All' statement)

2) Some dogs are small (Subject and Predicate are NOT distributed in 'some' statement).

3) No cats are dogs (Subject and Predicate are distributed in 'No' statement).

4) Some cats are not dogs (Predicate is distributed in 'Some not' statement).

3) **Illicit major:**

Major term is undistributed in the premises, but it is distributed in the conclusion.

Example:

Premises:

Some dogs are small

All dogs are cats

Concl:

Some cats are not small

(Major Term: It is always the **predicate** of the **conclusion**)

This case, major term is distributed in the conclusion, but it is not distributed in the premises. It an illicit major fallacy).

4) **Illicit minor:**

Minor term is undistributed in the premises, but it is distributed in the conclusion.

Example:

Premises:

All cats are dogs

Some dogs are small

Concl:

No small are cats

(Minor Term: It is always the **subject** of the **conclusion**)

5) **Fallacy of (mutually) exclusive premises** (Negative premises):

If both premises are negative, then syllogism is invalid.

Example:

Premises:

Some cats are not dogs

No small are dogs

Concl:

Some small are cats

(Syllogism is flawed and it is invalid, because NO conclusion can be drawn from two negative premises).

6) **Positive conclusion from a negative premise:**

If one premise is negative, then the conclusion must be negative.

(Fallacy of a **positive conclusion** from a **negative premise**)

Example:

Premises:

No small are dogs

All dogs are cats

Concl:

Some cats are small

(This case, conclusion is **positive** and one of the **premises** is negative. So syllogism is flawed)

7) **Existential Fallacy:**

**If two premises are universal, then conclusion must be universal.**

(Fallacy of getting a **particular** conclusion from **universal premises**)

Example:

Premises:

All small are dogs

All dogs are cats

Concl:

Some cats are small

(Conclusion is particular, but premises are universal. So, syllogism is flawed).