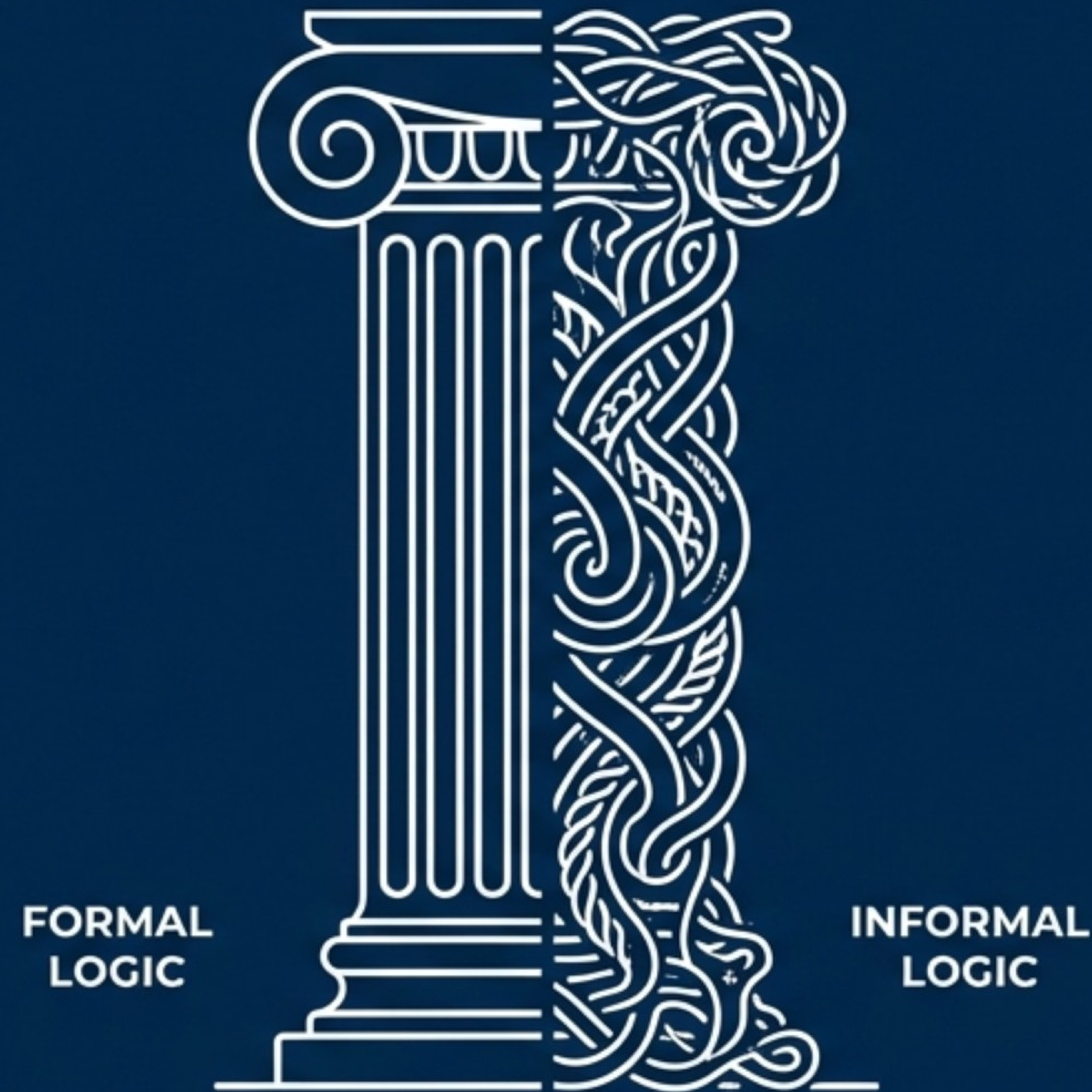


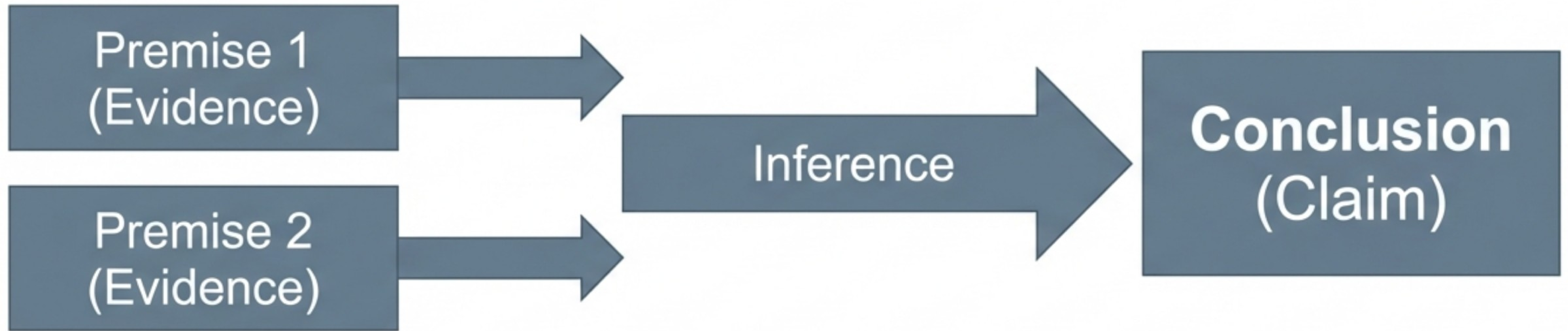
THE ARCHITECTURE OF REASON

DECONSTRUCTING LOGICAL FALLACIES: A GUIDE TO
SYLLOGISMS, CONDITIONAL LOGIC, AND CRITICAL THINKING



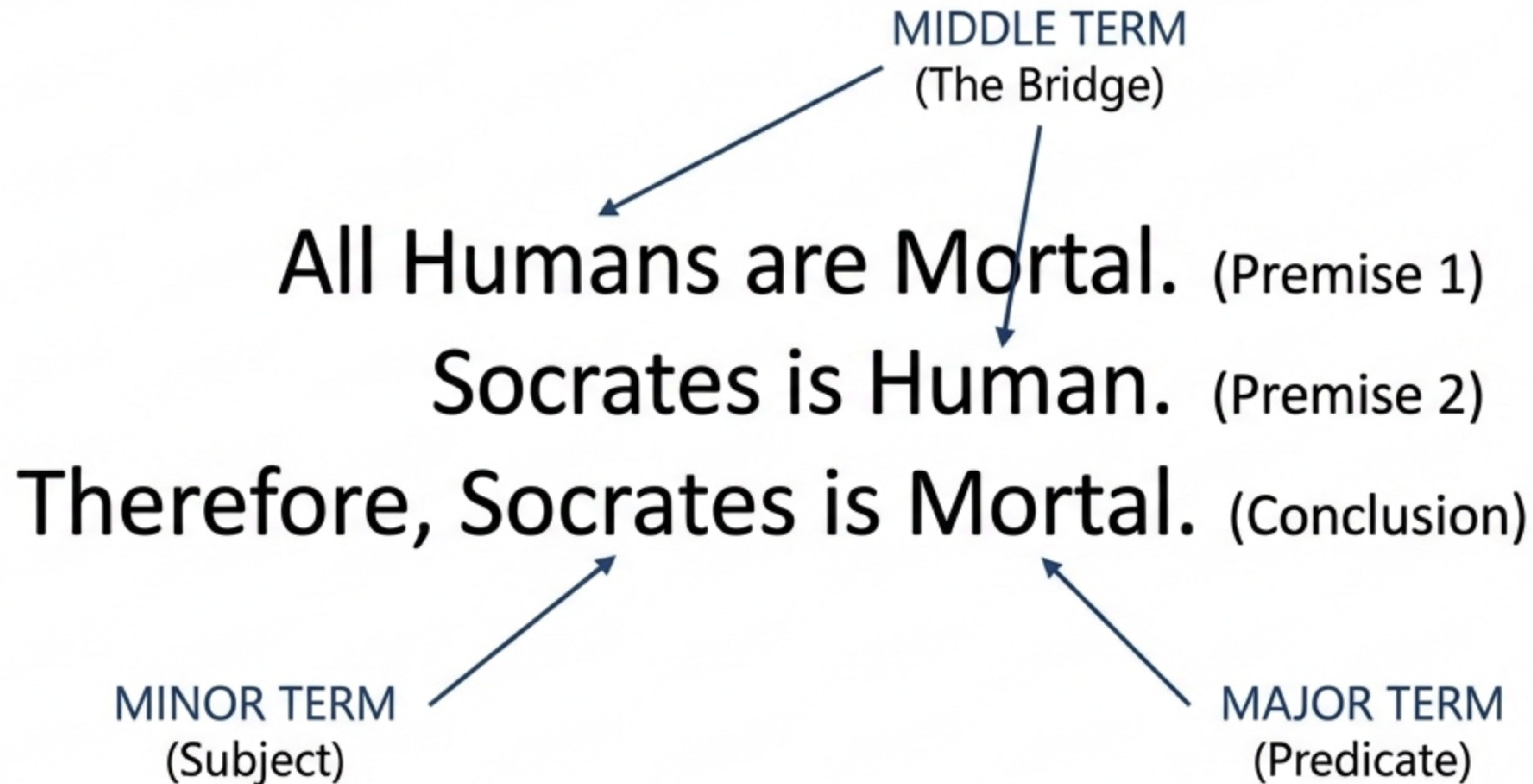
FORMAL STRUCTURE VS. INFORMAL CONTENT

The Anatomy of an Argument



- **The Argument:** A set of declarative statements (True/False) leading to a final judgment.
- **The Golden Rule:** Validity is determined by the structural link between Premises and Conclusion.
- **Formal Fallacy:** A break in the structural link.
- **Informal Fallacy:** A flaw in the content or language.

Mapping the Syllogism



The Middle Term: The mediator found in both premises but *never* in the conclusion. It bridges the Major and Minor terms.

The Rules of Distribution

Definition: A term is "Distributed" if the statement refers to the *entire* class of that term.

- **Key Mnemonic:** "Universal Negative (No/None) drowns everyone." (Distributes Both).
- **Universal Affirmative (All):** Only the Subject is distributed.

Universal Affirmative (A) "All S are P" Distributes: Subject Only	Universal Negative (E) 'No S are P' Distributes: Both Subject & Predicate
Particular Affirmative (I) 'Some S are P' Distributes: Neither	Particular Negative (O) 'Some S are not P' Distributes: Predicate Only

The Fallacy of the Undistributed Middle

The Rule: The Middle Term must be distributed in *at least one* premise.

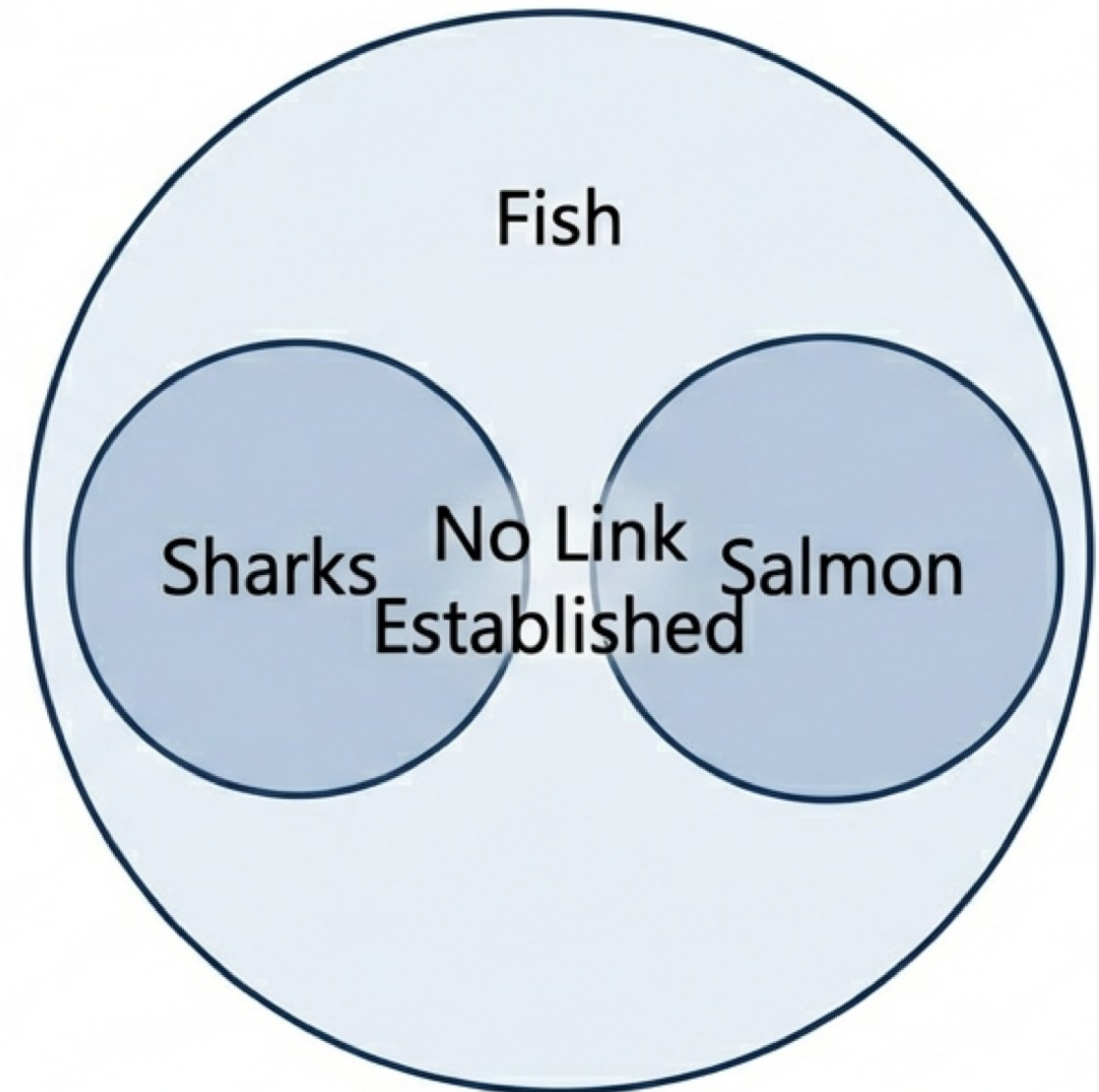
The Error: The Middle Term is never universal in either premise.

Example:

All Sharks are Fish.

All Salmon are Fish. (Middle Term 'Fish' is undistributed).

Therefore, All Salmon are Sharks.
(Invalid).



Illicit Major & Illicit Minor

The Rule

If a term is distributed in the Conclusion, it **must** be distributed in the Premise. You cannot claim more in the end than you started with.



Premises

Conclusion
(Overreach)

The Errors

Illicit Major: The Major Term (Conclusion's Predicate) is distributed in the conclusion but *not* in the premise.

Ex: All Dogs are Animals. No Cats are Dogs. → No Cats are Animals. (Animals distributed in conclusion, but not in premise).

Illicit Minor: The Minor Term (Conclusion's Subject) is distributed in the conclusion but *not* in the premise.

Ex: All Tigers are Mammals. All Tigers are Cats. → All Cats are Mammals. (Cats distributed in conclusion, but not in premise).

The Rules of Negativity

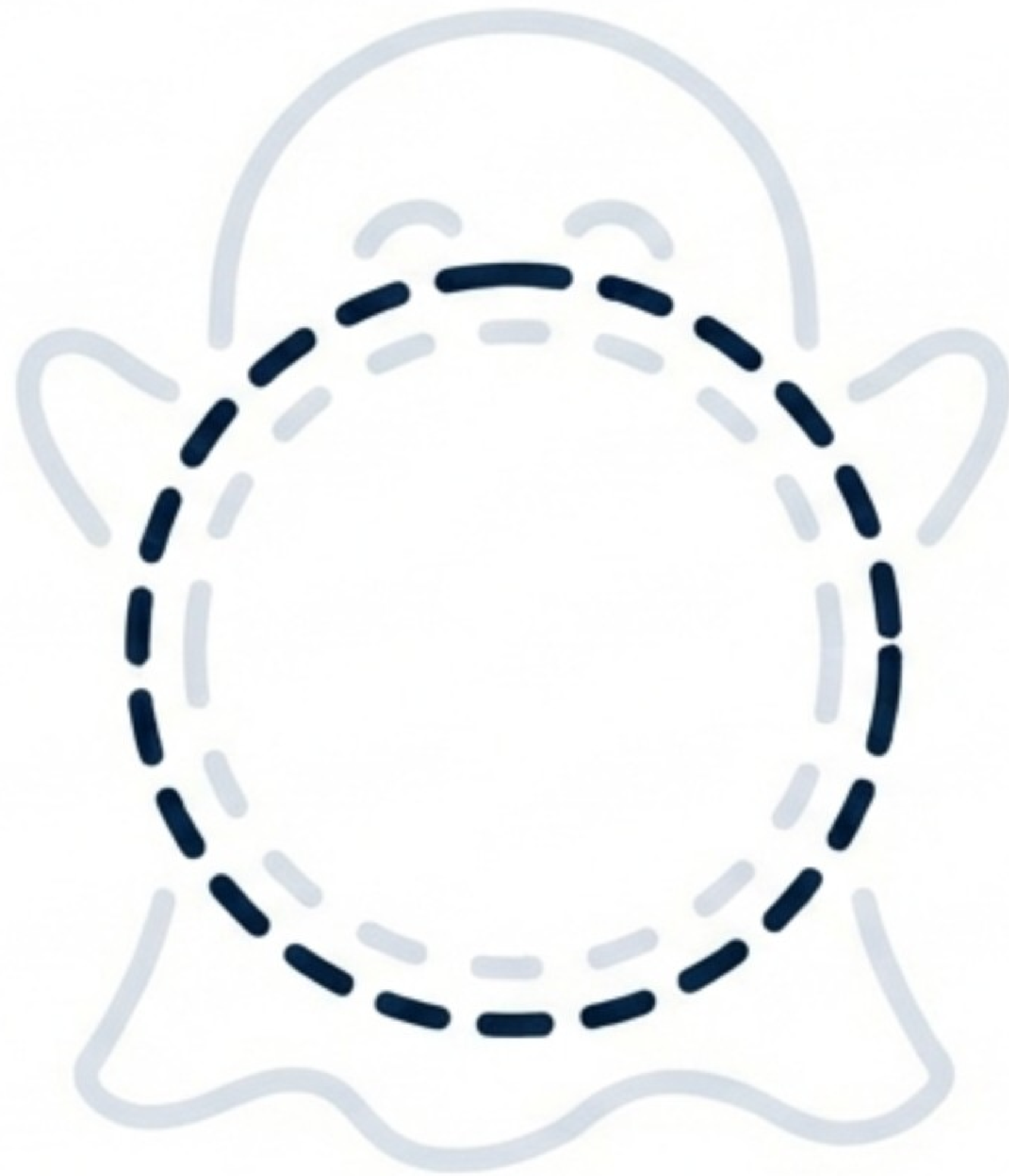
$(-) + (-) = \text{ERROR}$ (Exclusive Premises)

$(-) + (+) = (-)$ (Negative Conclusion Required)

Exclusive Premises Fallacy: You cannot draw a valid conclusion from two negative premises (e.g., “No A are B’, ‘No B are C’). The chain is broken.

Affirmative Conclusion from Negative Premise: If either premise is negative, the conclusion must be negative. A single ‘No’ infects the whole argument.

The Existential Fallacy



The Rule

Universal statements (All/No) do not imply actual existence in modern logic. They are hypothetical.

The Error

Deriving a Particular Conclusion (Some - which implies existence) from two Universal Premises.

Example:

- “All trespassers will be prosecuted.” (Universal Rule)
- “All prosecuted people are criminals.” (Universal Rule)
- Therefore, **Some** criminals are trespassers.” (Invalid: Assumes trespassers actually exist)

Conditional Logic: The One-Way Street

IF P (Antecedent) $\rightarrow$ THEN Q (Consequent)

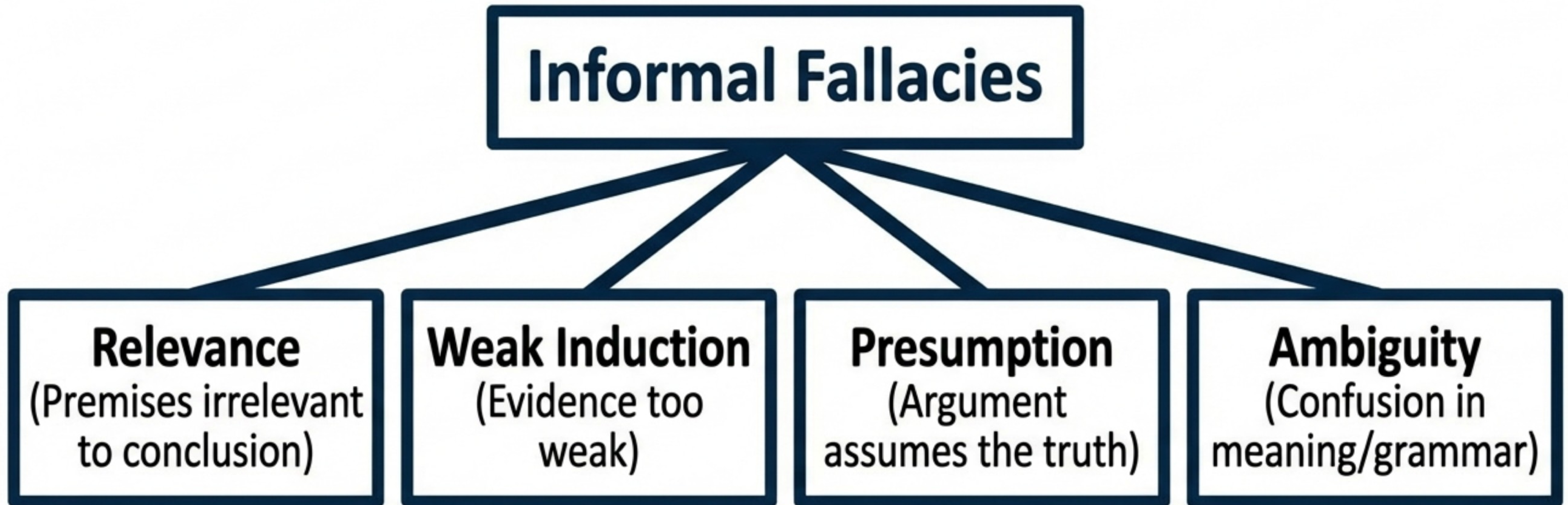
Valid Moves:

- **Modus Ponens:** P happens $\rightarrow$ Q happens.
- **Modus Tollens:** Q does not happen $\rightarrow$ P did not happen.

The Fallacies (Invalid Reverse Moves):

- **Affirming the Consequent:** Q is true $\rightarrow$ Therefore P is true. (Error: The roof is wet, so it must have rained? No, could be a hose.)
- **Denying the Antecedent:** P is false $\rightarrow$ Therefore Q is false. (Error: It didn't rain, so the roof is dry? No, could still be a hose.)

Informal Fallacies: The Traps of Language



Informal fallacies are errors in *content*, detectable by analyzing the meaning of words.

Fallacies of Relevance: Emotion Over Logic



Appeal to Force
Ad Baculum



Appeal to Pity
Ad Misericordiam



Appeal to People
Ad Populum

- **Appeal to Force:** Using threats (physical/psychological) to coerce acceptance. “Agree or suffer.”
- **Appeal to Pity:** Relying on sympathy rather than evidence. “I should pass because I am sad.”
- **Appeal to People:** The Bandwagon Effect. “Everyone believes it, so it must be true.”

Personal Attacks: Ad Hominem



- **Ad Hominem (Against the Person):** Attacking the arguer's character or traits instead of addressing their argument.
Ex: "Don't listen to his health advice; he is lazy."
- **Tu Quoque ('You Too'):** Dismissing an argument by claiming the accuser is a hypocrite.
Ex: "You tell me to stop smoking, but you smoke too" (The advice is valid, even if the speaker is a hypocrite).

Distraction Tactics: Straw Man vs. Red Herring



Straw Man

- **Straw Man:** Distorting an opponent's argument into an extreme, weak version to knock it down easily.
Ex: "You want to cut the budget? You must hate the poor!"



Red Herring

- **Red Herring:** Introducing a completely irrelevant topic to divert attention from the original issue.
Ex: "Why did I fail? Look at how nice my handwriting is!"

Weak Induction: Authority & Ignorance



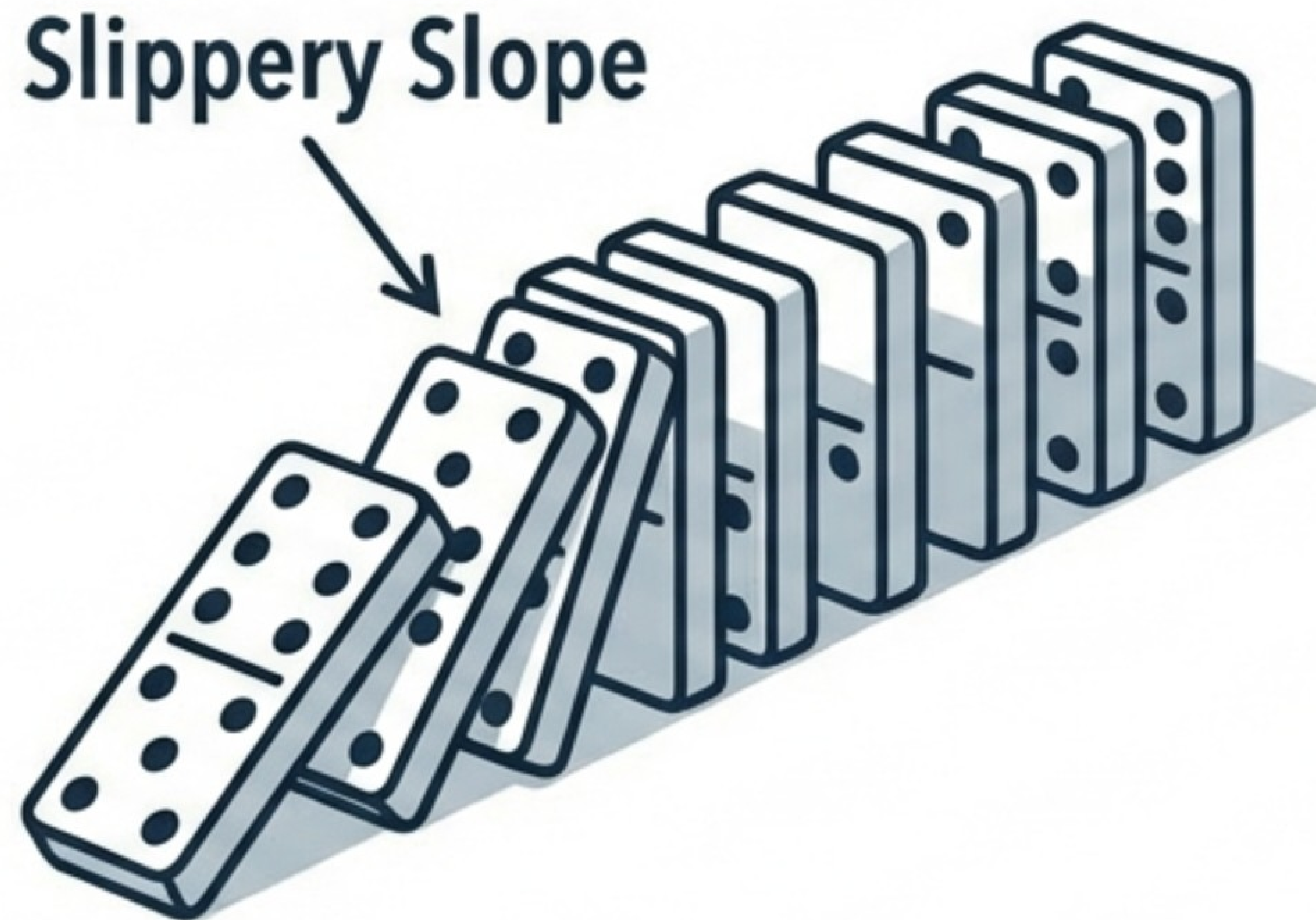
- **Appeal to Unqualified Authority:** Citing a witness or celebrity who lacks credibility in the specific field.

*Ex: Asking a Cricketer for medical advice.**

- **Appeal to Ignorance:** Arguing that something is true simply because it hasn't been proven false (or vice versa).

*Ex: 'Ghosts exist because you can't prove they don't.'**

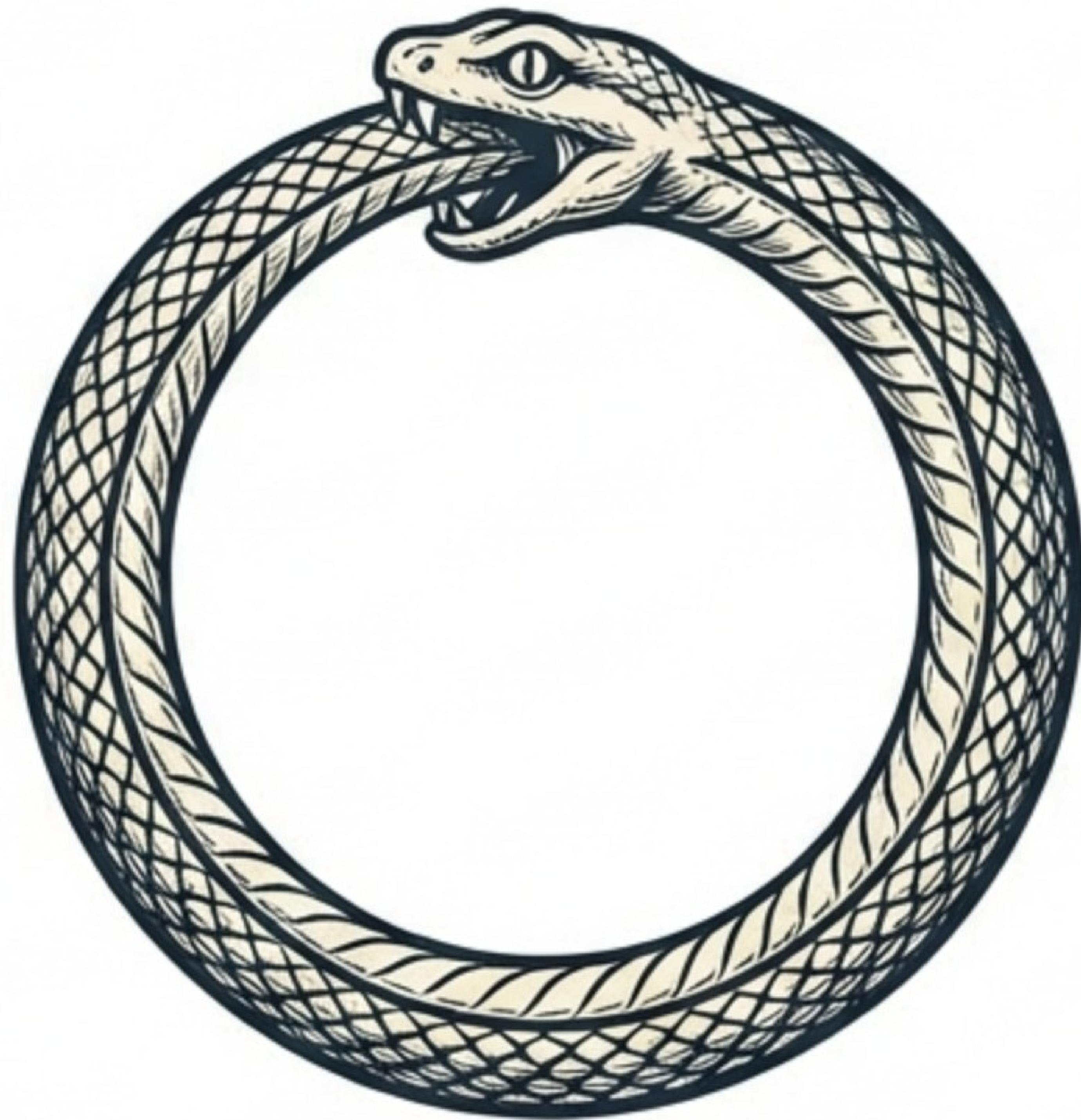
Generalization & Causation Errors



- **Hasty Generalization:** Drawing a universal conclusion from a tiny or biased sample (Stereotyping).
- **False Cause (Post Hoc):** Assuming X caused Y just because X happened before Y (Superstition).
- **Slippery Slope:** Asserting a small first step will lead to a catastrophic chain reaction without proof.

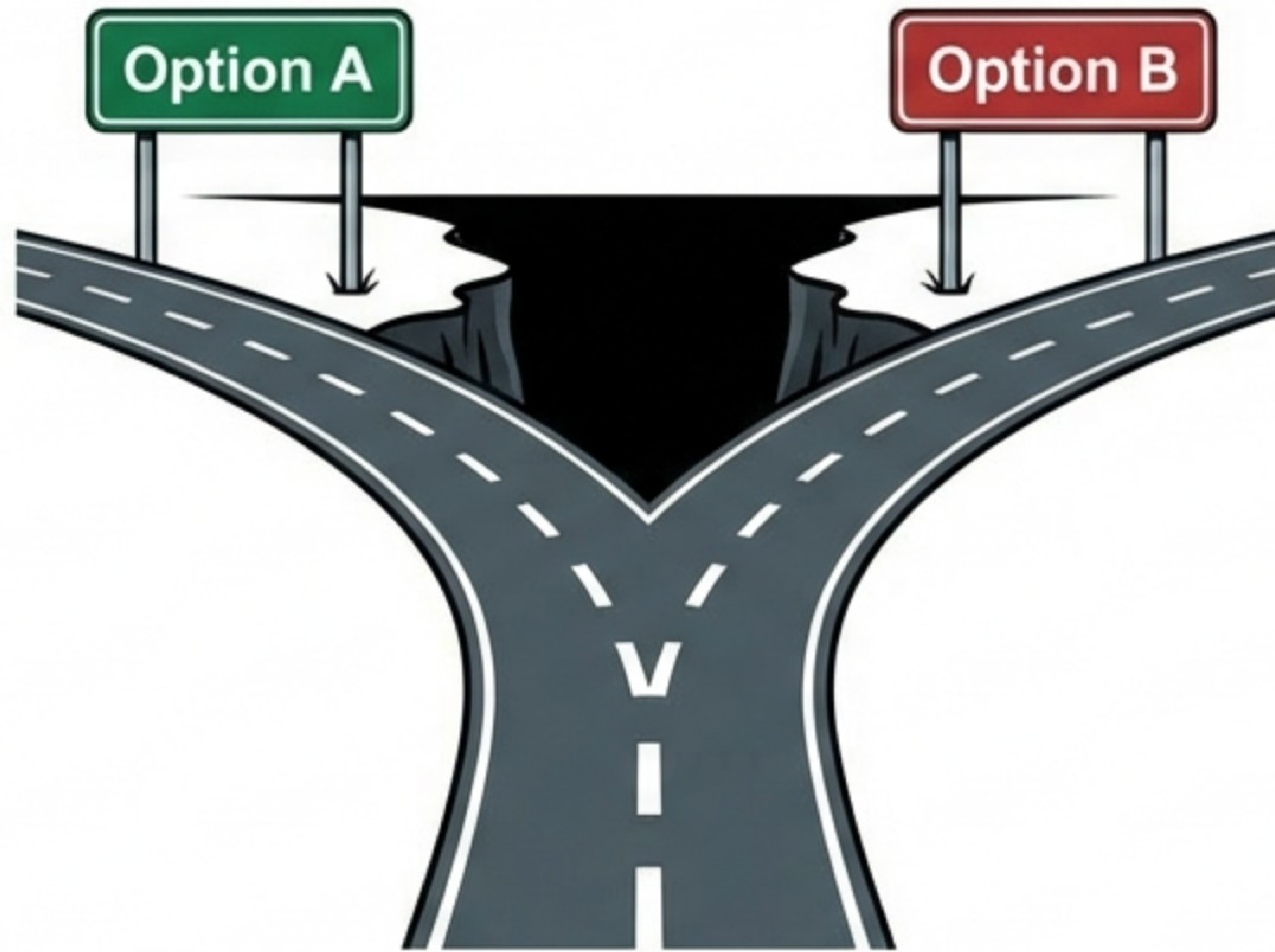
Ex: 'If you skip dinner, you will starve and die.'

Presumption: Begging the Question



- **Begging the Question (*Petitio Principii*):** Circular Reasoning. The conclusion is hidden in the premise; the argument assumes what it tries to prove.
Example: "Abortion is wrong because it is murder." (The premise assumes the conclusion that it is murder, without proving it).
- **Complex Question:** A trap question that presupposes a fact.
Ex: 'Have you stopped cheating on exams?' (Yes/No both admit to cheating).

False Dichotomy (False Dilemma)



- **The Error:** Presenting two options as the *only* possibilities, ignoring other alternatives.
- **The Trap:** 'Either / Or'.
- **Example:** 'You are either with us or against us.' (Ignores neutrality).
- **Example:** 'Ride in my car or jump out at 100mph.' (Ignores the option of slowing down).

Ambiguity: Equivocation & Amphiboly



- **Equivocation:** Using a single word with multiple meanings in a misleading way.

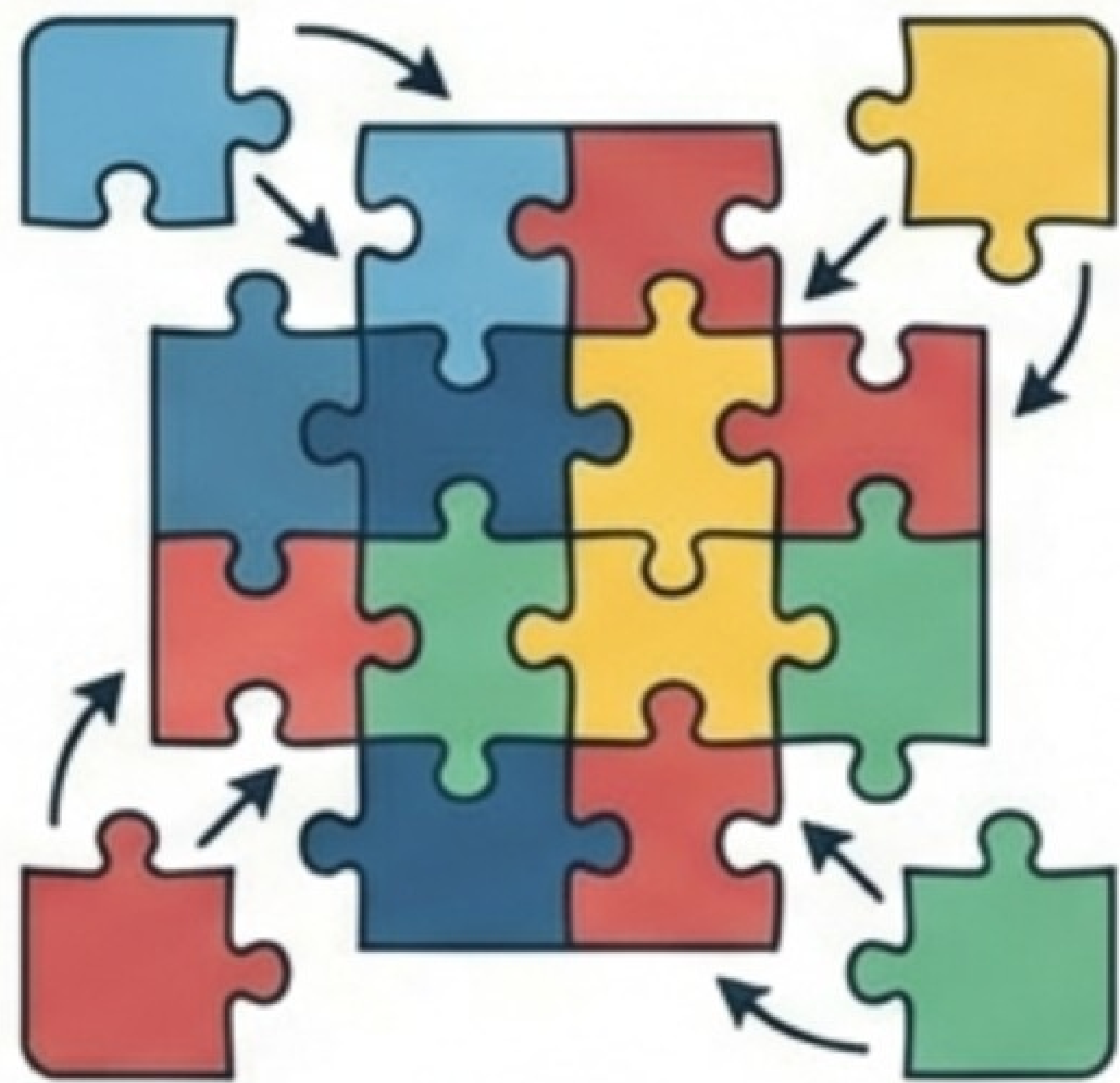
Ex: 'Mota Bhai' (Elder Brother vs. Body Shaming).

- **Amphiboly:** Ambiguity resulting from grammatical structure or missing punctuation.

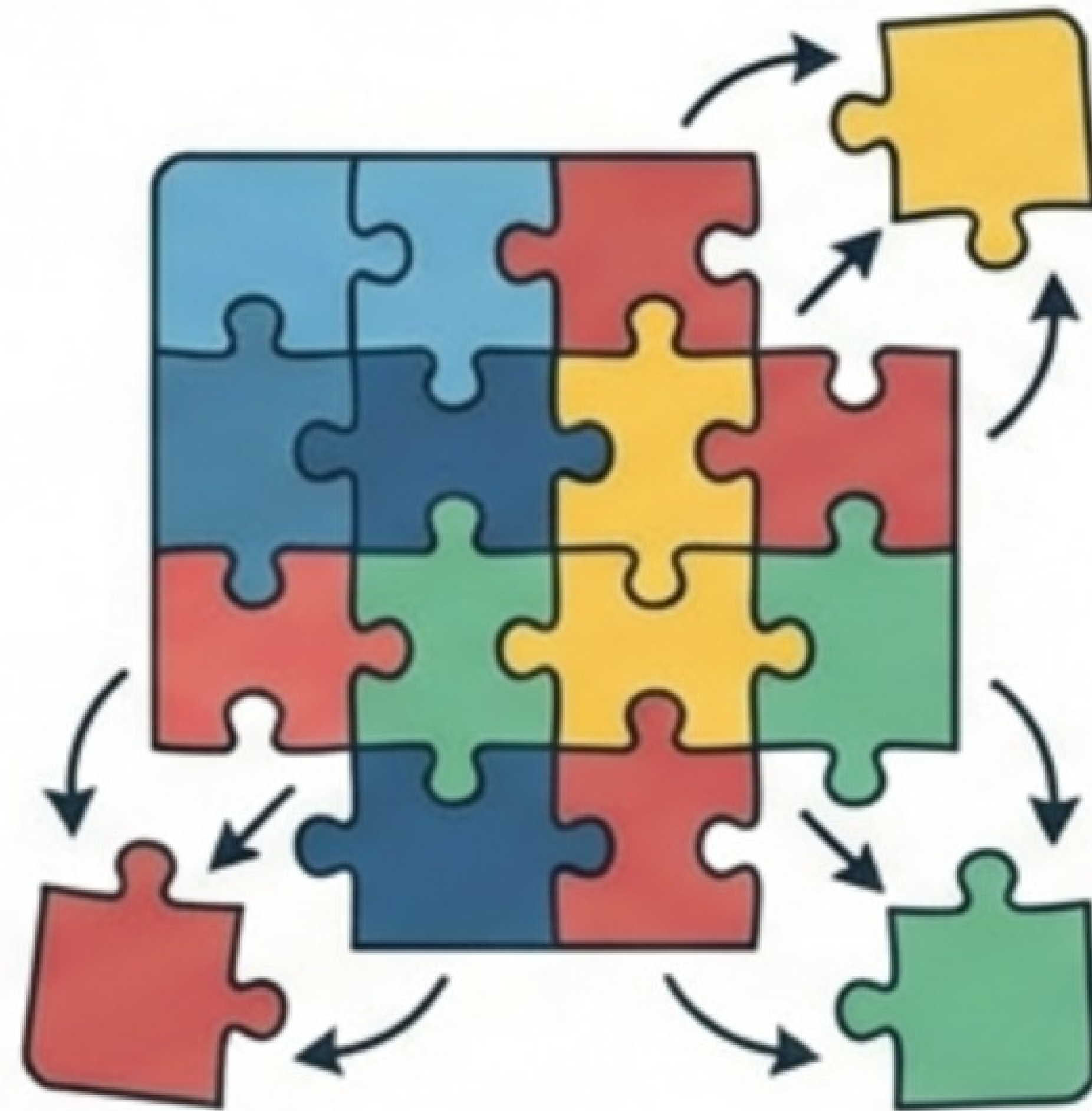
Ex: 'Let's eat Grandma!' vs. 'Let's eat, Grandma!' (The comma changes the meaning entirely).

Ambiguity: Composition & Division

Composition

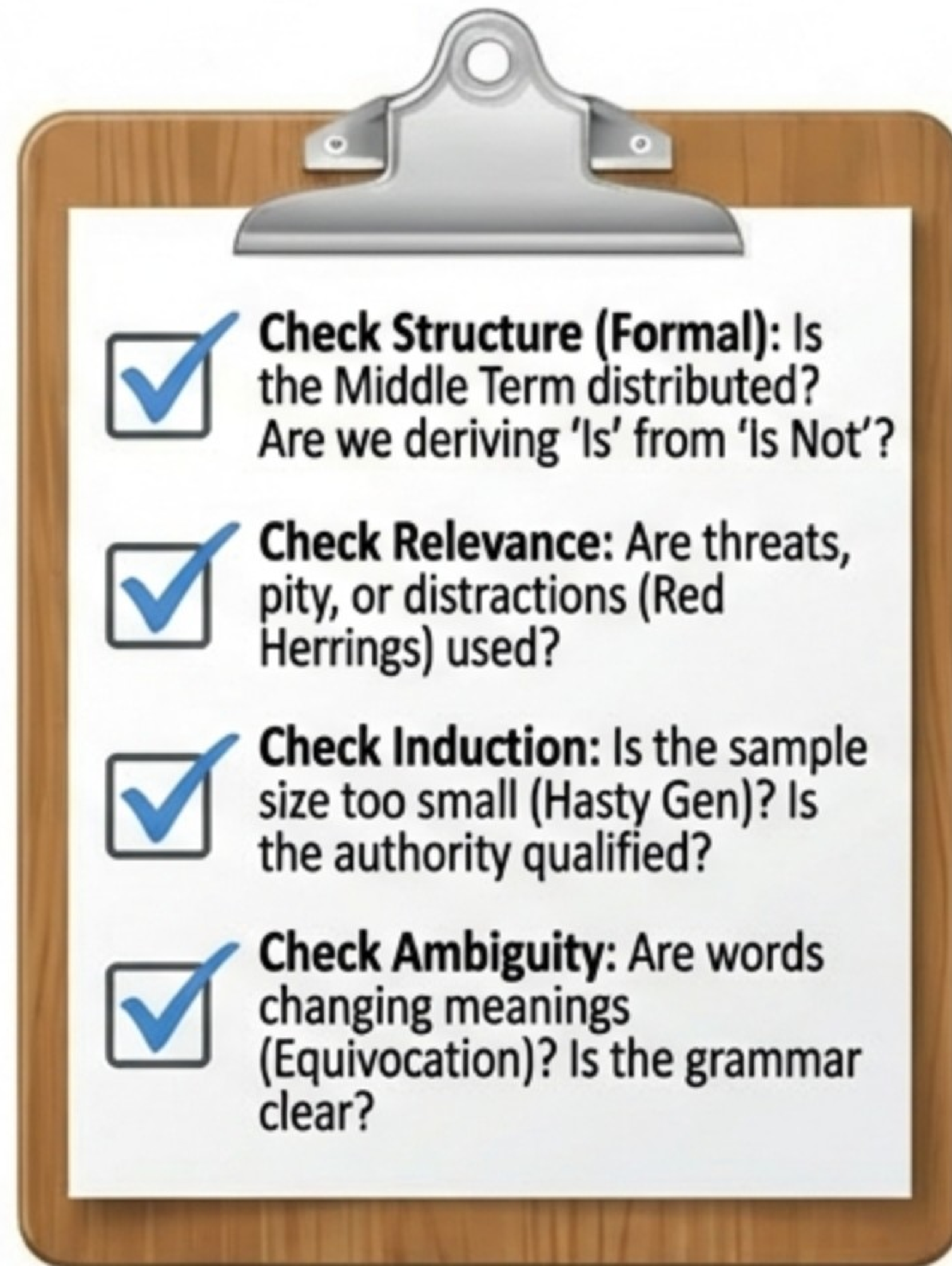


Division



- **Composition:** Assuming what is true for the *parts* is true for the *whole*.
 - Ex: 'Each part is light, so the machine is light.' (False).
- **Division:** Assuming what is true for the *whole* is true for the *parts*.
 - Ex: 'The team is excellent, so every player is excellent.' (False).

The Logic Detective's Checklist



- ☐ **Check Structure (Formal):** Is the Middle Term distributed? Are we deriving "Is" from "Is Not"?
- ☐ **Check Relevance:** Are threats, pity, or distractions (Red Herrings) used?
- ☐ **Check Induction:** Is the sample size too small (Hasty Gen)? Is the authority qualified?
- ☐ **Check Ambiguity:** Are words changing meanings (Equivocation)? Is the grammar clear?

Valid reasoning requires both structural integrity and sound content.