

"All generalizations are false—including this one."

-Henry David Thoreau, 1817-62-

Reason

- In logic, from assumptions, we have **premises**; a conclusion *has* to follow;
- *Types of reasoning*: deductive, inductive, informal;
- **Fallacy/Fallacies**: "invalid patterns of reasoning"



Deductive Reasoning

- **Syllogisms** = "two premises & a conclusion"
 - *God is love. Love is blind. ∴ God is blind.*
- **Truth versus Validity**
 - Truth... is concerned with what is the case & is a property of statements
 - Validity... concerns whether conclusions follow from premises & strength of argument
 - Arguments are not true/false; rather, valid/invalid
- **"Belief Bias"**: believe argument is valid simply because we agree with conclusion
- **"Just because an argument is valid it does not follow that the conclusion is true."**
- True conclusion requires 'Yes': Are the premises true? ; Is the argument valid?
- **Enthymeme**: incomplete argument due to missing premise
- Deductive reasoning preserves truth as distinguished from the source of truth

Inductive Reasoning

- ✓ "All human beings die" versus "All *observed* human beings die"

A Comparison

Deduction	Induction
<i>Definition</i>	
Reasoning from general to particular	Reasoning from particular to general
<i>Example</i>	
All metals expand when heated. X is a metal. Therefore, X expands when heated.	Metal X expands when heated; metal Y expands when heated; metal Z expands when heated. Therefore, <i>all</i> metals expand when heated.
<i>Value</i>	
More certain but less informative than induction	More informative but less certain than deduction

Confirmation Bias

Hasty generalizations; people tend to remember only evidence that supports their beliefs and to forget evidence that goes against them. Creationists vs. Evolutionists.

"Binary Thinking"

Black versus White within a Shades of Grey society. Origins: friend-or-foe; fight-or-flight.

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An Activity*

Consider: *A businessman had just turned off the lights in the store when a man appeared and demanded money. The owner opened a cash register. The contents of the cash register were scooped up, and the man sped away. A member of the police force was notified promptly.*

Directions: Given the information in the story, respond to each of the 11 statements below by writing next to each one either 'T' if the statement is definitely true, 'F' if the statement is definitely false, and 'U' if the statement is unknown.

1. A man appeared after the owner had turned off his store lights.
2. The robber was a man.
3. The man did not demand money.
4. The man who opened the cash register was the owner.
5. The store owner scooped up the contents of the cash register and ran away.
6. Someone opened a cash register.
7. After the man who demanded the money scooped up the contents of the cash register, he ran away.
8. While the cash register contained money, the story does not state how much.
9. The robber demanded money of the owner.
10. The story concerns a series of events in which only three persons are referred to: the owner of the store, a man who demanded money, and a member of the police force.
11. The following events in the story are true: someone demanded money, a cash register was opened, its contents were scooped up, and a man dashed out of the store.

Notes:

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*Theory of Knowledge for the IB Diploma: Richard van de Lagemaat, p. 122.

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A Summary: The Ten Deadly Fallacies		
<i>Ad ignorantium</i> <i>(appeal to ignorance)</i>	Claiming something is true because it cannot be proved to be false	<i>UFOs exist because their non-existence has not been proven.</i>
Hasty generalization	Generalizing from insufficient evidence	<i>A tourist experiences one rude French waiter. It follows that all French waiters are rude.</i>
<i>Post hoc ergo propter hoc</i> <i>('after this, therefore on account of this')</i>	Confusing a correlation with a causal connection	<i>Hotter summers means global warming is real.</i>
<i>Ad hominem</i> <i>('against the man')</i>	Attacking/supporting the person rather than the argument	<i>Student: "Teachers deserve higher salaries!!" Tuition Payer: "You are too young to understand..."</i>
Circular reasoning	Assuming the truth of what you are supposed to be proving	<i>The decision to invade Iraq was righteous since invading Iraq was the right thing to do.</i>
Special pleading	Using double standards to excuse an individual or group	<i>Exceeding the speed limit in a school zone is punishable by fine but ex-Pat families driving near ISD should be given special dispensation.</i>
Equivocation	Using language ambiguously	<i>Feathers are light. Light is not dark. Therefore, no feathers are dark.</i>
False analogy	Assuming that because two things are alike in some respects they are alike in other respects	<i>A school is like a business. Just as a business wants to make a profit so must a school give priority to value-added.</i>
False dilemma	Assuming that only two black and white alternatives exist	<i>Either $1 + 1 = 0$ or $1 + 1 = 1$. Since $1 + 1 \neq 0$ it follows that $1 + 1 = 1$.</i>
Loaded question	A question that is biased because it contains a built-in assumption	<i>Have you stopped smoking marijuana? "Yes" implies you were smoking; "No" implies you still are smoking.</i>