INFORMAL LOGIC

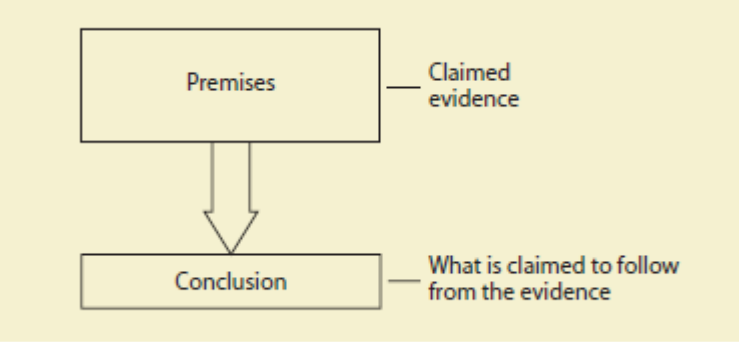
Patrick J Hurley - A Concise Introduction to Logic.pdf

Ch1, 2, 3

BASIC CONCEPT

Statement, argument, premise, conclusion

- Statement : sentence that is either true or false
- Arguments : group of statement
- Premises : the statements that set forth the reasons or evidence,
- Conclusions : the statement that the evidence is claimed to support or imply
- Note : Questions, proposals, suggestions, commands, and exclamations are not usually classified as statements.



Logic may be defined as the organized body of knowledge, or science, that evaluates arguments

The following sentences are statements:

- Chocolate truffles are loaded with calories.
- Melatonin helps relieve jet lag.
- Political candidates always tell the complete truth.
- No wives ever cheat on their husbands.
- Tiger Woods plays golf and Maria Sharapova plays tennis.

The following sentences are not statements:

- Where is Khartoum? (question)
- Let’s go to a movie tonight. (proposal)
- I suggest you get contact lenses. (suggestion)
- Turn off the TV right now. (command)
- Fantastic! (exclamation)

Argument

- Argument 1
  - All film stars are celebrities.
  - Halle Berry is a film star.
  - Therefore, Halle Berry is a celebrity.
- Argument 2
  - Some film stars are men.
  - Cameron Diaz is a film star.
  - Therefore, Cameron Diaz is a man.

premise indicators are

- since
- in that
- seeing that
- as indicated by
- may be inferred from
- for the reason that
- because
- as
- in as much as
- for
- given that
- owing to

conclusion indicators are

- therefore
- accordingly
- entails that
- wherefore
- we may conclude
- hence
- thus
- it must be that
- it follows that
- consequently
- for this reason
- implies that
- we may infer
- so
- as a result

Argument

- Argument 3 :
  - It is vitally important that wilderness areas be preserved, for wilderness provides essential habitat for wildlife, including endangered species, and it is a natural retreat from the stress of daily life.
- Argument 4 :
  - The space program deserves increased expenditures in the years ahead. Not only does the national defense depend on it, but the program will more than pay for itself in terms of technological spin-offs. Furthermore, at current funding levels the program cannot fulfill its anticipated potential.

Argument 4 restructured

- P1: The national defense is dependent on the space program.
- P2: The space program will more than pay for itself in terms of technological spinoffs.
- P3: At current funding levels the space program cannot fulfill its anticipated potential.
- C: The space program deserves increased expenditures in the years ahead.

Summary of argument

- In deciding whether a passage contains an argument, you should look for three things:
  (1) indicator words such as “therefore,” “since,” “because,” and so on;
  (2) an inferential relationship between the statements; and
  (3) typical kinds of nonarguments.
- But remember that the mere occurrence of an indicator word does not guarantee the presence of an argument.
- You must check to see that the statement identified as the conclusion is claimed to be supported by one or more of the other statements.
- Also keep in mind that in many arguments that lack indicator words, the conclusion is the first statement.
- Furthermore, it helps to mentally insert the word “therefore” before the various statements before deciding that a statement should be interpreted as a conclusion.

Exercise

1. The claim is often made that malpractice lawsuits drive up the cost of health care. But if such suits were outlawed or severely restricted, then patients would have no means of recovery for injuries caused by negligent doctors. Hence, the availability of malpractice litigation should be maintained intact.
2. Massive federal deficits push up interest rates for everyone. Servicing the debt gobbles up a huge portion of the federal budget, which lowers our standard of living. And big deficits also weaken the value of the dollar. For these reasons, Congress must make a determined effort to cut overall spending and raise taxes. Politicians who ignore this reality imperil the future of the nation.

Summary of argument

- The typical kinds of nonarguments that we have surveyed are as follows:
  - warnings
  - reports
  - pieces of advice
  - expository passages
  - statements of belief
  - illustrations
  - statements of opinion
  - explanations
  - loosely associated statements
  - conditional statements
- These kinds of nonargument are not mutually exclusive, for example, one and the same passage can sometimes be interpreted as both a report and a statement of opinion, or as both an expository passage and an illustration.

Answer “true” or “false” to the following statements:

1. The purpose of the premise or premises is to set forth the reasons or evidence given in support of the conclusion.
2. Some arguments have more than one conclusion.
3. All arguments must have more than one premise.
4. The words “therefore,” “hence,” “so,” “since,” and “thus” are all conclusion indicators.
5. The words “for,” “because,” “as,” and “for the reason that” are all premise indicators.
6. In the strict sense of the terms, *inference* and *argument* have exactly the same meaning.
7. In most (but not all) arguments that lack indicator words, the conclusion is the first statement.
8. Any sentence that is either true or false is a statement.
9. Every statement has a truth value.
10. Aristotle is the person usually credited with being the father of logic.

Deduction and induction

- Argument 1 Inductive
  - The meerkat is closely related to the suricat.
  - The suricat thrives on beetle larvae.
  - Therefore, probably the meerkat thrives on beetle larvae.
- Argument 2 Deductive
  - The meerkat is a member of the mongoose family.
  - All members of the mongoose family are carnivores.
  - Therefore, it necessarily follows that the meerkat is a carnivore.

Deductive arguments form

- Deductive argument : the premises are supposed to provide absolute support for the conclusion.
- Five examples of such forms
  - arguments based on mathematics,
  - arguments from definition,
  - arguments from categorical syllogisms
  - arguments from hypothetical syllogisms
  - arguments from disjunctive syllogisms

Deductive argument

Premises	Conclusion	Validity
T	T	?
T	F	Invalid
F	T	?
F	F	?

	Valid	Invalid
True premises	All flowers are plants. All daisies are flowers.	All flowers are plants. All daisies are plants.
True conclusion	Therefore, all daisies are plants. **[sound]**	Therefore, all daisies are flowers. **[unsound]**
True premises	None exist	All roses are flowers. All daisies are flowers.
False conclusion		Therefore, all daisies are roses. **[unsound]**
False premises	All flowers are dogs. All poodles are flowers.	All dogs are flowers. All poodles are flowers.
True conclusion	Therefore, all poodles are dogs. **[unsound]**	Therefore, all poodles are dogs. **[unsound]**
False premises	All flowers are dogs. All tigers are flowers.	All roses are cats. All daisies are cats.
False conclusion	Therefore, all tigers are dogs. **[unsound]**	Therefore, all daisies are roses. **[unsound]**

Sound argument = Valid argument + All true premises

Inductive arguments form

- Inductive arguments are such that the content of the conclusion is in some way intended to “go beyond” the content of the premises :
  - **prediction** is an argument that proceeds from our knowledge of the past to a claim about the future.
  - **argument from analogy** is an argument that depends on the existence of an analogy, or similarity, between two things or states of affairs.
  - **generalization** is an argument that proceeds from the knowledge of a selected sample to some claim about the whole group.
  - **argument from authority** is an argument that concludes something is true because a presumed expert or witness has said that it is.
  - **argument based on signs** is an argument that proceeds from the knowledge of a sign to a claim about the thing or situation that the sign symbolizes.
  - **causal inference** is an argument that proceeds from knowledge of a cause to a claim about an effect, or, conversely, from knowledge of an effect to a claim about a cause.

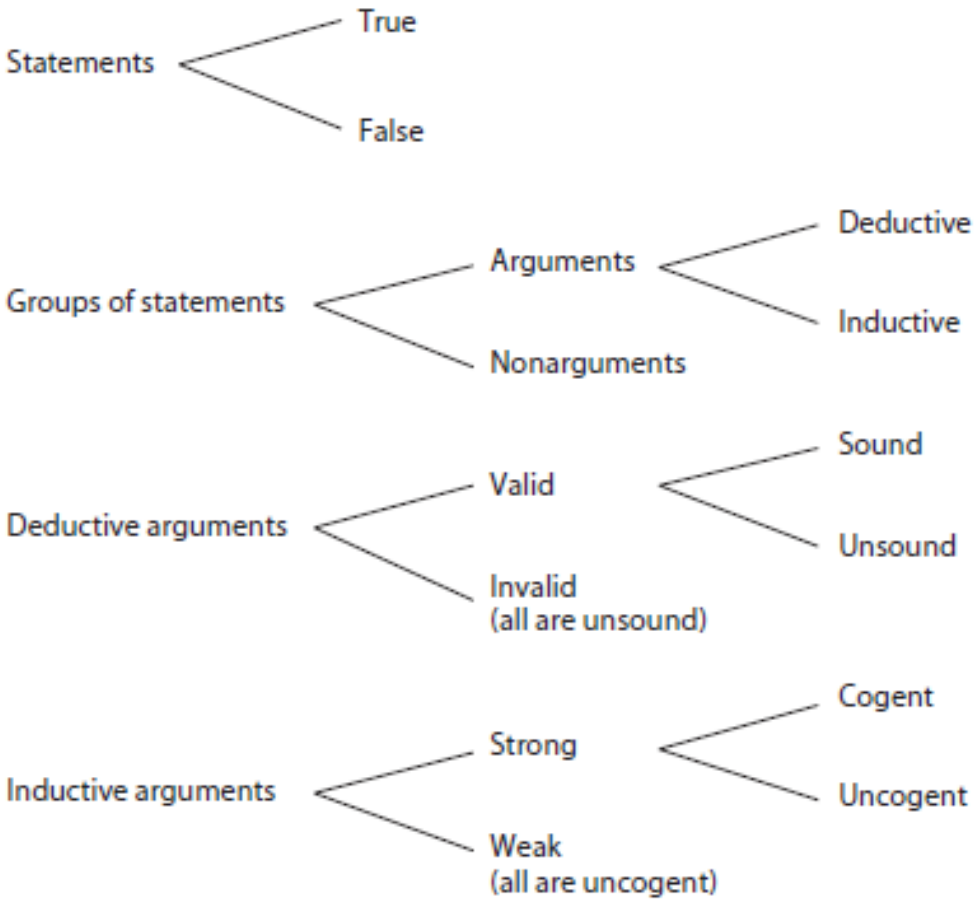
Inductive argument

	Strong	Weak
True premise **Probably true conclusion**	Every previous U.S. president was older than 40. Therefore, probably the next U.S. president will be older than 40. **[cogent]**	A few U.S. presidents were lawyers. Therefore, probably the next U.S. president will be older than 40. **[uncogent]**
True premise **Probably false conclusion**	None exist	A few U.S. presidents were unmarried. Therefore, probably the next U.S. president will be unmarried. **[uncogent]**
False premise **Probably true conclusion**	Every previous U.S. president was a TV debater. Therefore, probably the next U.S. president will be a TV debater. **[uncogent]**	A few U.S. presidents were dentists. Therefore, probably the next U.S. president will be a TV debater. **[uncogent]**
False premise **Probably false conclusion**	Every previous U.S. president died in office. Therefore, probably the next U.S. president will die in office. **[uncogent]**	A few U.S. presidents were dentists. Therefore, probably the next U.S. president will be a dentist. **[uncogent]**

Premises	Conclusion	Strength
T	probably T	?
T	probably F	Weak
F	probably T	?
F	probably F	?

Cogent argument = Strong argument + All true premises

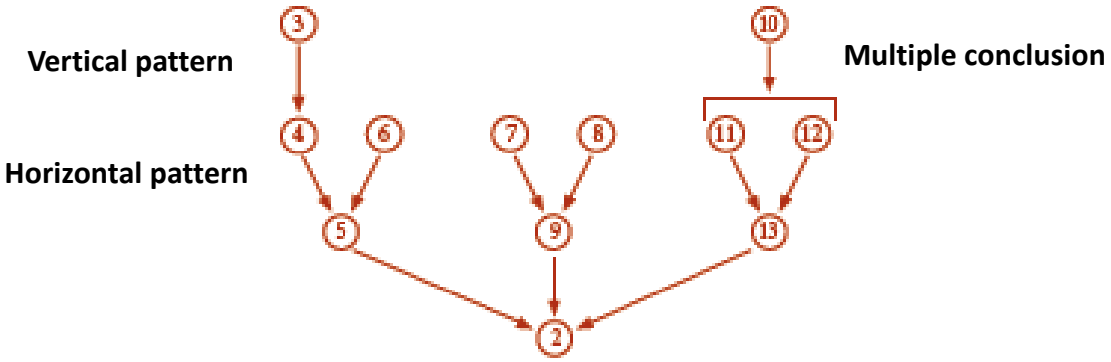
Summary


Statements
True
False
Groups of statements
Arguments
Deductive
Inductive
Nonarguments
Deductive arguments
Valid
Sound
Unsound
Invalid
(all are unsound)
Inductive arguments
Strong
Cogent
Uncogent
Weak
(all are uncogent)

Extended argument

1. Community college districts save a great deal of money by hiring untenured part-time instructors, but
2. the extensive use of these instructors is a disadvantage to the students.
3. Most part-time instructors are paid only 60 percent of what a full-time teacher earns, and as a result,
4. they are forced to teach five or six courses just to survive.
5. This detracts from the opportunity to consult with students outside the classroom. To make matters worse,
6. many part-timers are not even given office space. Furthermore,
7. the lower pay demoralizes the part-timer, and
8. the lack of tenure makes for constant financial insecurity.
9. Obviously these conditions render the instructor less receptive to student needs. Lastly, because
10. these part-timers are burning the candle from both ends,
11. they have no spare energy to improve their courses, and
12. Many lack the enthusiasm to motivate their students. As a result,
13. the educational process is impaired.

(Gordon Dossett et al., “Part-Time College Instructors”)

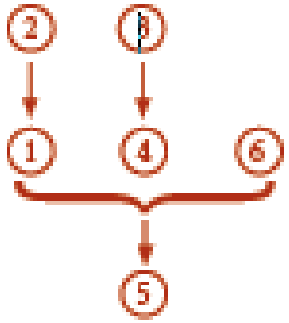


Extended argument

1. Rhinos in Kenya are threatened with extinction because
2. poachers are killing themfor their horn. Since
3. the rhino has no natural predators,
4. it does not need its horn
5. to survive. Thus
6. there should be an organized program to capture rhinos in the wild and remove their horn.
7. Such a program would eliminate the incentive of the poachers.

(Pamela C. Wagner, “Rhino Poaching”)

Vertical pattern



Conjoint premises

LANGUAGE

LANGUAGE: MEANING & DEFINITION

- A **lexical definition** is used to report the meaning that a word already has in a language.
- Lexical definitions are governed by eight rules. They should:
  - Conform to the standards of proper grammar.
  - Convey the essential meaning of the word being defined.
  - Be neither too broad nor too narrow.
  - Avoid circularity.
  - Not be negative when they can be affirmative.
  - Avoid figurative, obscure, vague, or ambiguous language.
  - Avoid affective terminology.
  - Indicate the context to which the definiens pertains.

language is used to

- ask questions
- tell jokes
- tell stories
- flirt with someone
- tell lies
- give directions
- guess at answers
- sing songs
- form hypotheses
- issue commands
- launch verbal assaults
- greet someone

Linguistic expressions can have different kinds of meaning:

- Cognitive meaning: Conveys information
- Emotive meaning: Expresses or evokes feelings

Emotive meaning

- Statements having emotive meaning often make value claims.
  - When such statements occur in arguments, the value claims should be disengaged from the emotive terminology and expressed as separate premises.
- A **value claim** is a claim that something is good, bad, right, wrong, better, worse, more important, or less important than some other thing.
  - For example, the statement about the death penalty asserts the value claim that the death penalty is wrong or immoral.
  - Such value claims are often the most important part of the cognitive meaning of emotive statements.

Cognitive meaning

Cognitive meanings can be defective in two ways:

- Vagueness: The meaning is blurred.
- Ambiguity: More than one clearly distinct meaning is possible.

Term

A term is a word or phrase that can serve as the subject of a statement.

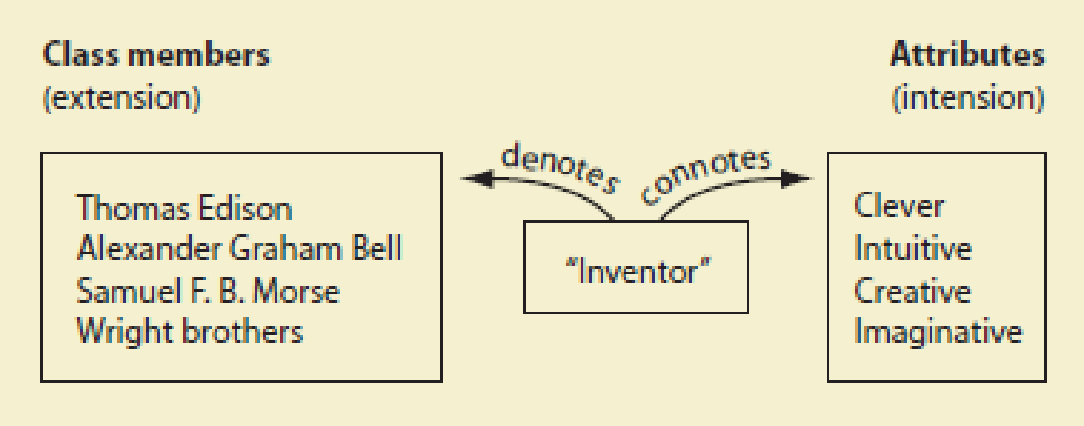
Terms include:

- Proper names (Napoleon, North Dakota, etc.)
- Common names (animal, house, etc.)
- Descriptive phrases (author of *Hamlet*, books in my library, etc.)

Meaning of term

Terms can have different kinds of meaning:

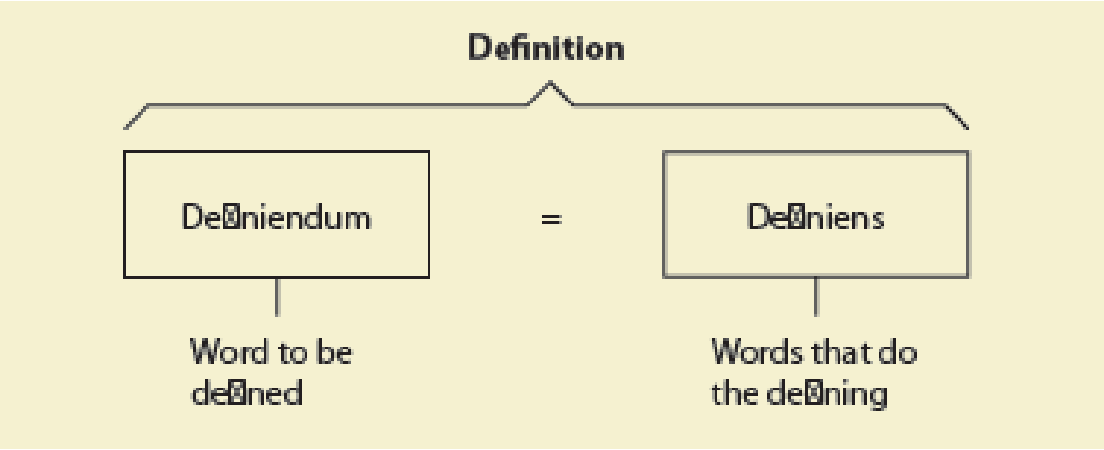
- Intensional meaning (or intension): The attributes that the term connotes
- Extensional meaning (or extension): The members of the class that the term denotes



Definition

A definition is a word or group of words that assigns a meaning to a word or group of words:

- Definiendum: The word or group of words being defined
- Definiens: The word or group of words that does the defining



INFORMAL FALLACY

LOGIC FALLACIES

- A **fallacy** is a defect in an argument that arises from either a mistake in reasoning or the creation of an illusion that makes a bad argument appear good.
- A **formal fallacy** is one that may be identified by merely examining the *form* or *structure* of an argument.
  - Fallacies of this kind are found only in deductive arguments that have identifiable forms.
- **Informal fallacies** are those that can be detected only by examining the content of the argument.

Fallacies of Relevance:

The premises are not relevant to the conclusion:

- Appeal to force: Arguer threatens the reader/listener.
- Appeal to pity: Arguer elicits pity from the reader/listener.
- Appeal to the people: Arguer incites a mob mentality (direct form) or appeals to our desire for security, love, or respect (indirect form). This fallacy includes appeal to fear, the bandwagon argument, appeal to vanity, appeal to snobbery, and appeal to tradition.
- Argument against the person: Arguer personally attacks an opposing arguer by verbally abusing the opponent (*ad hominem* abusive), presenting the opponent as predisposed to argue as he or she does (*ad hominen* circumstantial), or by presenting the opponent as a hypocrite (*tu quoque*). Note: For this fallacy to occur, there must be two arguers.
- Accident: A general rule is applied to a specific case it was not intended to cover.
- Straw man: Arguer distorts an opponent's argument and then attacks the distorted argument. Note: For this fallacy to occur, there must be two arguers.
- Missing the point: Arguer draws a conclusion different from the one supported by the premises. Note: Do not cite this fallacy if another fallacy fits.
- Red herring: Arguer leads the reader/listener off the track.

Fallacies of Weak Induction:

The premises may be relevant to the conclusion, but they supply insufficient support for the conclusion:

- Appeal to unqualified authority: Arguer cites an untrustworthy authority.
- A ppeal to ignorance: Premises report that nothing is known or proved about some subject, and then a conclusion is drawn about that subject.
- Hasty generalization: A general conclusion is drawn from an atypical sample.
- False cause: Conclusion depends on a nonexistent or minor causal connection. This fallacy has four forms: *post hoc ergo propter hoc, non causa pro causa,* oversimplified cause, and the gambler's fallacy.
- Slippery slope: Conclusion depends on an unlikely chain reaction of causes.
- Weak analogy: Conclusion depends on a defective analogy (similarity).

Fallacies of Presumption:

The premises presume what they purport to prove:

- Begging the question: Arguer creates the illusion that inadequate premises are adequate by leaving out a key premise, restating the conclusion as a premise, or reasoning in a circle.
- Complex question: Multiple questions are concealed in a single question.
- False dichotomy: An “either . . . or . . . ” premise hides additional alternatives.
- Suppressed evidence: Arguer ignores important evidence that requires a different conclusion.

Fallacies of Ambiguity:

The conclusion depends on some kind of linguistic ambiguity:

- Equivocation: Conclusion depends on a shift in meaning of a word or phrase.
- A mphiboly: Conclusion depends on an incorrect interpretation of an ambiguous statement made by someone other than the arguer.

Fallacies of Illicit Transference:

An attribute is incorrectly transferred from the parts of something onto the whole or from the whole onto the parts:

- Composition: An attribute is incorrectly transferred from the parts to the whole.
- Division: An attribute is incorrectly transferred from the whole to the parts.

Fallacies that occur in real-life argumentation may be hard to detect:

- They may not exactly fit the pattern of the named fallacies.
- They may involve two or more fallacies woven together in a single passage.

Three factors underlie the commission of fallacies in real-life argumentation:

- The intent of the arguer (the arguer may intend to mislead someone).
- Mental carelessness combined with unchecked emotions.
- Unexamined presuppositions in the arguer's worldview.

Note

- USE HURLEY'S CH3 FOR ELABORATION TO THE STUDENT