

LOGIC I



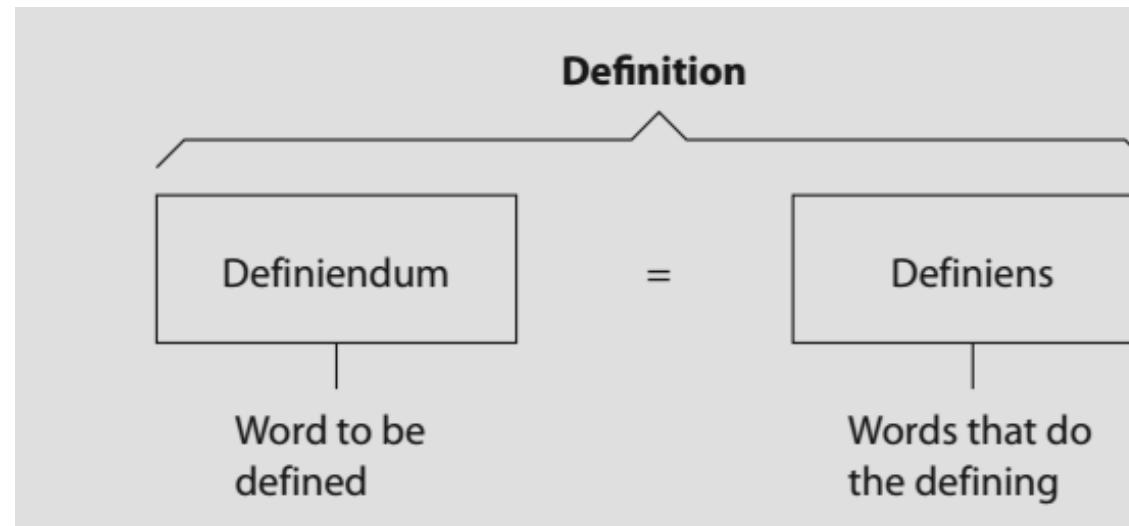
Language, Meaning, & Definition

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Definition

What is a definition?

a group of words that assigns a meaning to some word or term and consists of two parts: the **definiendum** and the **definiens**.



Definition

Why do we need definitions?

Definitions provide:

- Meaning
- Understanding
- Clarity
- Context

definition
defə'niSH(ə)n

noun

a statement of the exact meaning of a word,
especially in a dictionary.

Definition



P: A car's gearbox loses a lot of energy as **heat** while it's running.

P: Its gears create a lot of **friction** when they turn.

P: The materials used for the gears can **breakdown** over time.

C: So, a car's gearbox would be considered **inefficient**.

Definition

- **5 Definitions Types**
- **7 Definitions Techniques**
- **8 Definition Rules**

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noun

a statement of the exact meaning of a word,
especially in a dictionary.

What is your favorite manga, movie, book, TV show?

1. Write 2 premises and conclusion stating that your choice is the best choice.

Example:

C: Dune is the best movie in the sci-fi genre.

P1: Dune uses the an optimally effective soundtrack with exquisite composition and soundscapes.

P2: The storyline is complex and engages the audience's full attention.

5 Definition Types

- Stipulative - 約款
- Lexical - 語彙
- Precising – 精度
- Theoretical - 理論的
- Persuasive - 說得力

definition
defə'niSH(ə)n

noun

a statement of the exact meaning of a word,
especially in a dictionary.

Definition

Stipulative Definitions

Assigns meaning to words for the first time

- Stipulate = make specific
- Simplifies
- Introduces new terms
- Arbitrary, and cannot be “true” or “false”.
- Cannot provide new information about the subject matter of the definiendum.
- Stipulative definition problems occur when a person uses a word in a strange way and assumes everyone else understands.
- That person is using the word “stipulatively,” which is rarely justified.



Language, Meaning, & Definition



The need to digitalize Japanese society as a whole

“The digital agency should become a strong organization which can function as a **powerful control tower**, with highly talented people gathering from both the public and private sectors, to lead the digitalization of the society as a whole,” Suga said on Sept. 23 at a meeting of ministers involved in digital reform.

What did you picture in your mind?

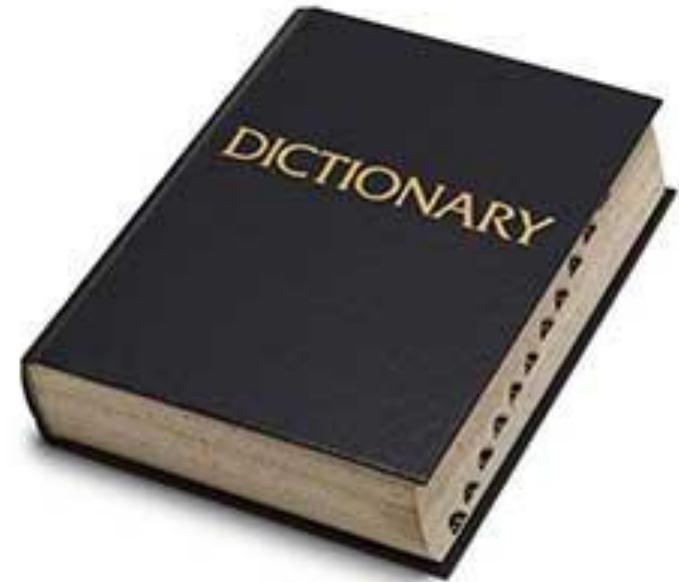


Definition

Lexical Definitions

Reports meaning of existing word

- Dictionary definitions
- Eliminates Ambiguity – makes certain
- Is “true” or “false”.



Lexical means relating to the words or vocabulary of a language.

This class is so bad.

“Bad” in the slang sense of cool or good.

Definition

Precising Definitions

Increases precision of a word or term

- Specifies
- Clarifies vague meanings – makes clear
- Frequent in law and science



Probable Cause – A reasonable basis for believing that a crime may have been committed for an arrest, or evidence of the crime for a search.

Where is a precising definition needed?

Definition

Theoretical Definitions

Assigns meaning based on a theory

- Specifies
- Allows for agreement of terms
- Frequent in science
- Cannot be “true” or “false”

Heavy Drinking – Drinking 5 or more alcoholic **drinks** on the same occasion on each of 5 or more days in the past 30 days.



What's the problem with this definition: stipulative, Lexical, precising?

Definition

Persuasive Definitions

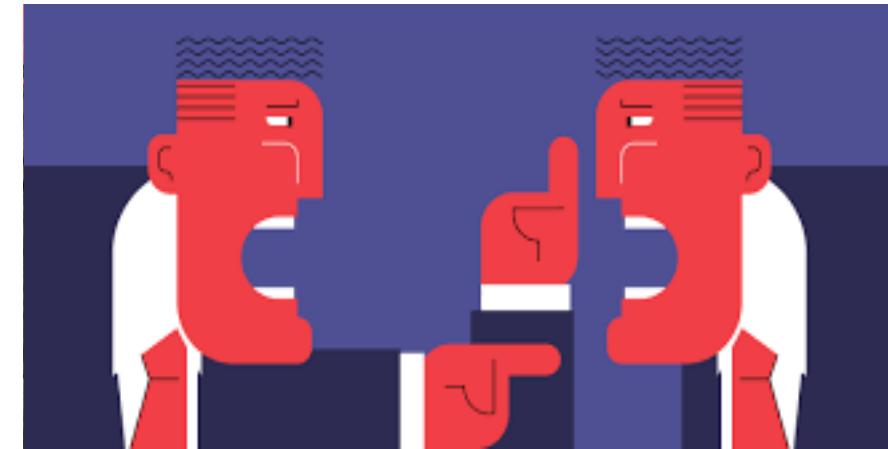
Assigns opinionated, emotional meaning

- Can be stipulative, lexical, theoretical
- Seeks to influence through values
- Can be “true” or “false”
- But always ineffective

“Abortion” - the ruthless murdering of innocent children

“Abortion” - a safe surgical procedure whereby a woman is relieved of an unwanted burden

“Abortion” - the termination of a pregnancy resulting in the death of the embryo or fetus





What type of definition is this: "The hirsute man loved to go to the beach. Hirsute means extremely hairy."

Precising

Stipulative

Lexical

Theoretical

Persuasive





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- Precising
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What type of definition is this: "This is a nice restaurant, as in, high class and a bit expensive."

Precising

Stipulative

Lexical

Theoretical

Persuasive

**What type of definition is this: "This is a nice restaurant, as
in, high class and a bit expensive."**

- Precising
- Stipulative
- Lexical
- Theoretical
- Persuasive

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Precising

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**What type of definition is this: "Spending more money on
the Japanese Defense Force is our fiscal responsibility.
Fiscal responsibility, meaning a financial duty to protect
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Precising

Stipulative

Lexical

Theoretical

Persuasive

What is your favorite manga, movie, book, TV show?

1. Write 2 premises and conclusion stating that your choice is the best choice.
2. Add a premise giving a needed definition and name the definition type.
(Stipulative, Lexical, Precising, Theoretical, Persuasive)

Example:

C: Dune is the best movie in the sci-fi genre.

P1: Dune uses the an optimally effective soundtrack with exquisite composition and soundscapes.

P2: Soundscapes comprise the sounds heard in a particular location, helping to illustrate the setting. (Lexical)

P3: The storyline is complex and engages the audience's full attention.

7 Definition Techniques

- **Demonstrative - 実証的**
- **Enumerative - 列挙**
- **Subclass – 分類**
- **Synonymous - 同義語**
- **Etymological - 語源**
- **Operational - 運用**
- **Genus & Difference - 屬と差異**

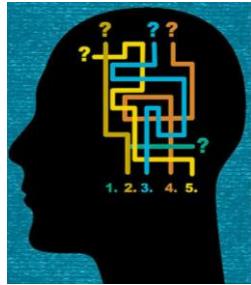
This Technique	Can Produce This Type of Definition					
	Stipulative	Lexical	Precising	Theoretical	Persuasive	
Demonstrative	yes	yes	no	(unusual)	(unusual)	
Enumerative	yes	yes	no	(unusual)	(unusual)	
Subclass	yes	yes	no	(unusual)	(unusual)	
Synonymous	no	yes	no	no	no	
Etymological	yes	yes	no	no	no	
Operational	(limited)	yes	yes	(unusual)	(unusual)	
Genus and Difference	yes	yes	yes	yes	yes	



How do you define Human?

Varieties of Meaning

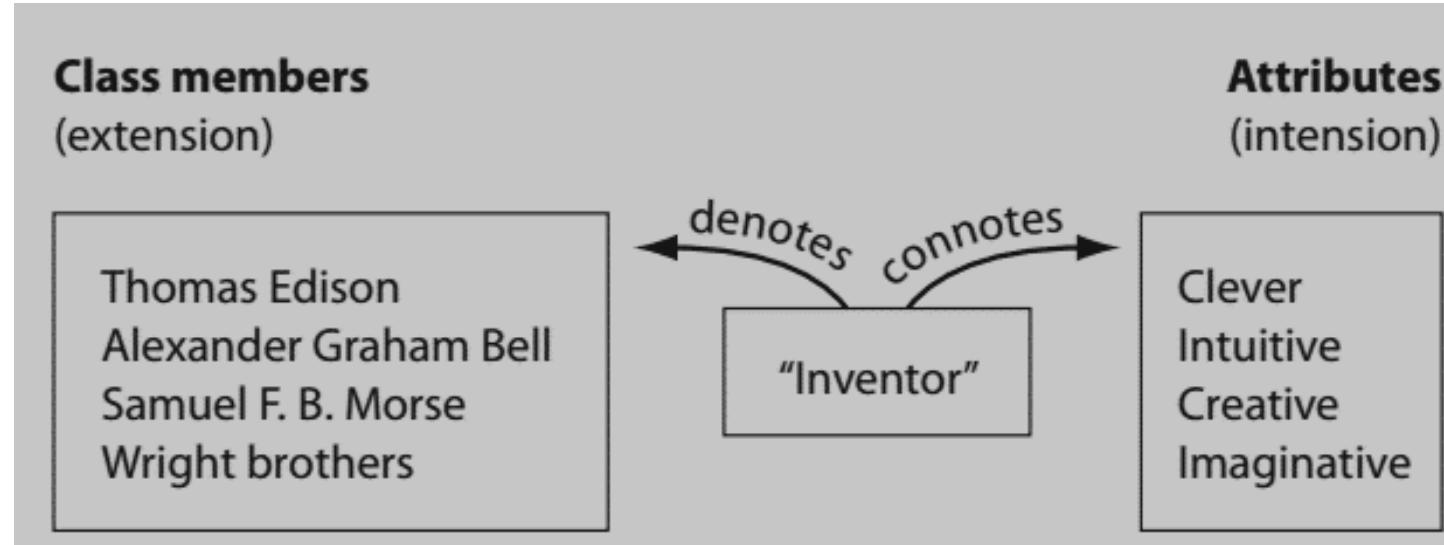
COGNITIVE



Intension and Extension

Intention = Connotation of attributes (特質)

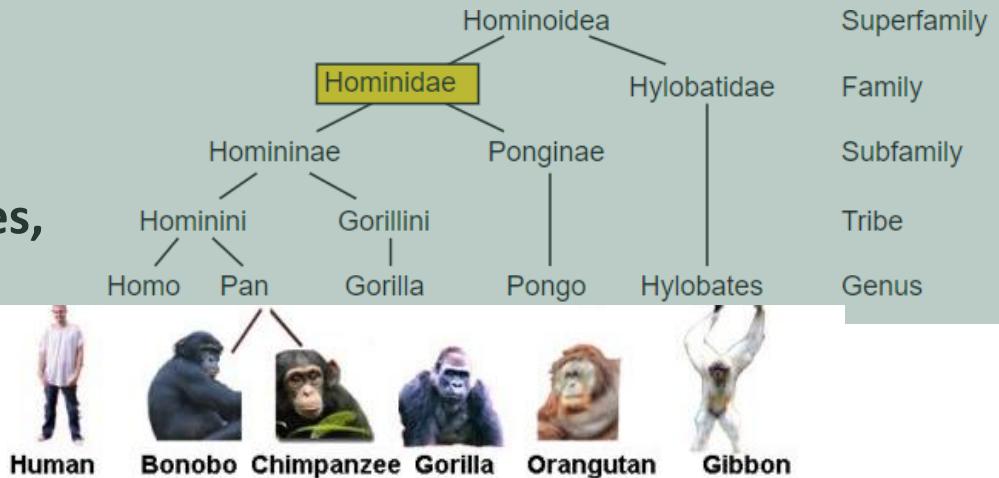
Extension = Denotation of class (名称)



7 Definition Techniques

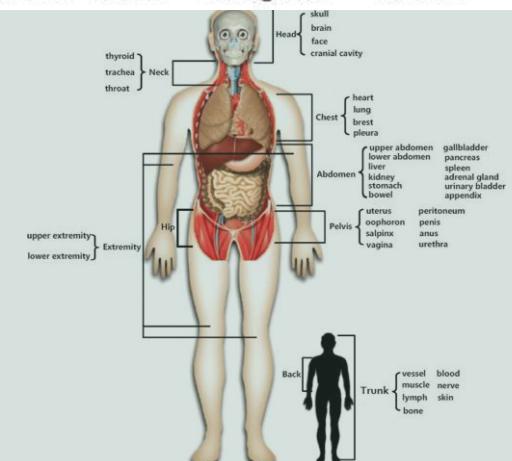
Extension – class members

Humans (*Homo sapiens*) are a species of highly intelligent primates. They are the only extant members of the subtribe Hominina and—together with chimpanzees, gorillas, and orangutans—are part of the family Hominidae (the great apes, or hominids).



Intension - attributes

The human body consists of the legs, the torso, the arms, the neck, and the head. An adult human body consists of about 100 trillion (10^{14}) cells. The most defined body systems in humans are the nervous, the cardiovascular, the circulatory, the digestive, the endocrine, the immune, the integumentary, the lymphatic, the musculoskeletal, the reproductive, the respiratory, and the urinary system.



7 Definition Techniques

- Demonstrative
- Enumerative
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Extensional Definitions

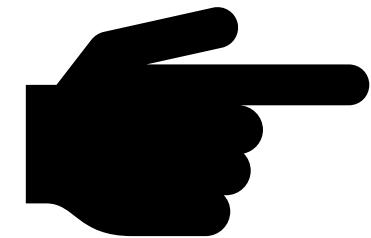
Extensional (denotative) definition is one that assigns a meaning to a term by indicating the members of the class that the definiendum denotes. There are at least three ways of indicating the members of a class: pointing to them, naming them individually, and naming them in groups. The three kinds of definitions that result are called demonstrative definitions, enumerative definitions, and definitions by subclass.

7 Definition Techniques

Demonstrative Definitions

Defines by showing

- Limited
- Gesture
- Foreign language



“Chair” means this and this and this—as you point to several chairs, one after the other.

“Washington Monument” means that—as you point to it.

7 Definition Techniques

Enumerative Definitions

Assigns meaning by naming other members of the group it denotes

- The entire group is better



“Actress” means a person such as Scarlett Johansson, Nakajo Ayami, or Yui Aragaki.

“Baltic state” means Estonia, Latvia, or Lithuania.

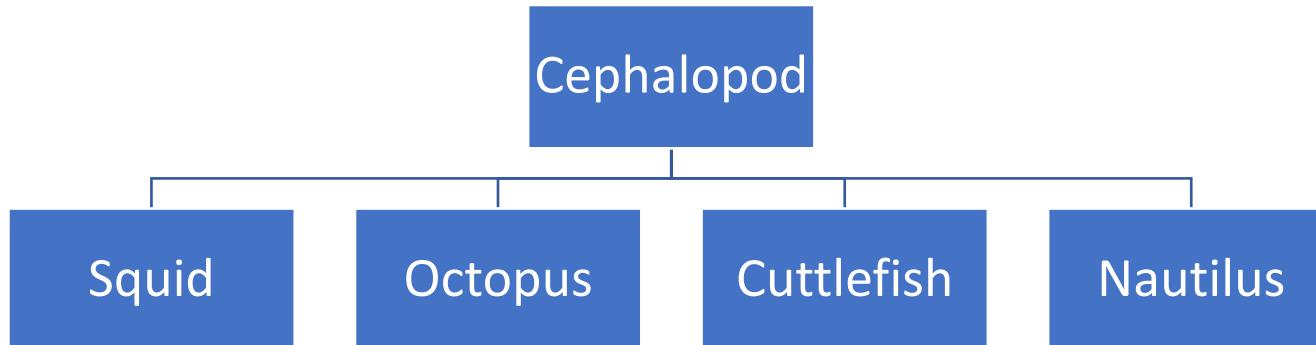
7 Definition Techniques

Subclass Definitions

Assigns a meaning to a term by naming subclasses of the class denoted by the term.

“Tree” means an oak, pine, elm, spruce, maple, and the like.

“Flower” means a rose, lily, daisy, geranium, zinnia, and the like.



Intensional Definitions

Intensional (connotative) definition assigns a meaning to a word by indicating the qualities or attributes that the word connotes. There are at least four kinds of intensional definitions: synonymous definition, etymological definition, operational definition, and definition by genus and difference.

7 Definition Techniques

Synonymous Definitions

definiens is a single word that connotes the same attributes as the definiendum.

- A synonym

“Physician” means doctor.

“Pupil” means student.

“Flatulence” means farts.

“Mastication” means chewing.

Muscles of Mastication

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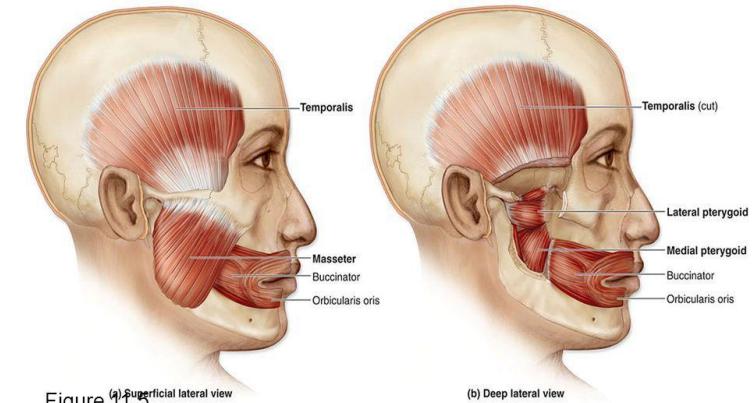


Figure 11.5
(a) Superficial lateral view

(b) Deep lateral view

7 Definition Techniques

Etymological Definitions

Assigns meaning to words with the word's ancestry

- English comes from: German, Greek, Latin, others
- Root meaning
- Access many definitions



“Democracy” comes from *dēmos* (the people) + *-kratia* (power, rule).

“Cephalopod” comes from cephalo (head) + pod (foot).

“Philosophy” comes from the Greek *phylos* (love) + *sophie* (wisdom)

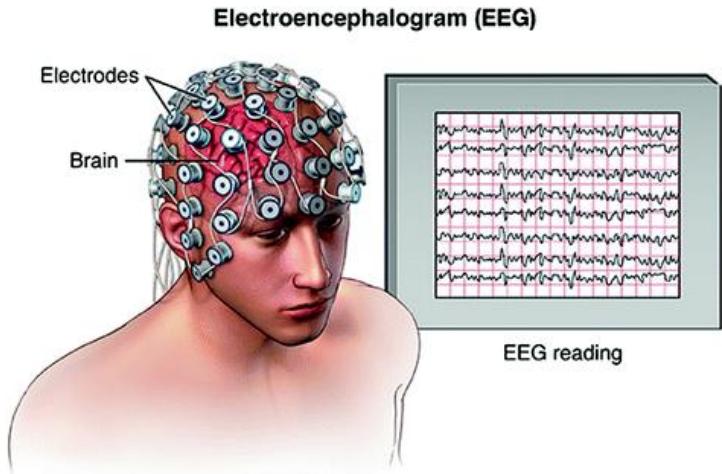
7 Definition Techniques

Operational Definitions

Assigns meaning to words by specifying experimental procedures that determine if the word applies to something

- If/then cases
- For abstract, theoretical, scientific purposes
- Does not work well outside of science

One substance is “harder than” another if one scratches the other when the two are rubbed together.
“Brain activity” means that an EEG shows oscillations when attached to a patient’s head.
A solution is an “acid” if and only if litmus paper turns red when dipped into it.



7 Definition Techniques

Definitions by Genus & Difference

Assigns meaning to terms by identifying a genus term and one or more difference words that, when combined, convey the meaning

- logic genus and species are different than biology, KPCOFGS
- Genus means larger class, species means smaller class

Species

“Daughter”

means

Difference

female

“Husband”

means

married

“Doe”

means

female

“Fawn”

means

very young

“Skyscraper”

means

very tall

Genus

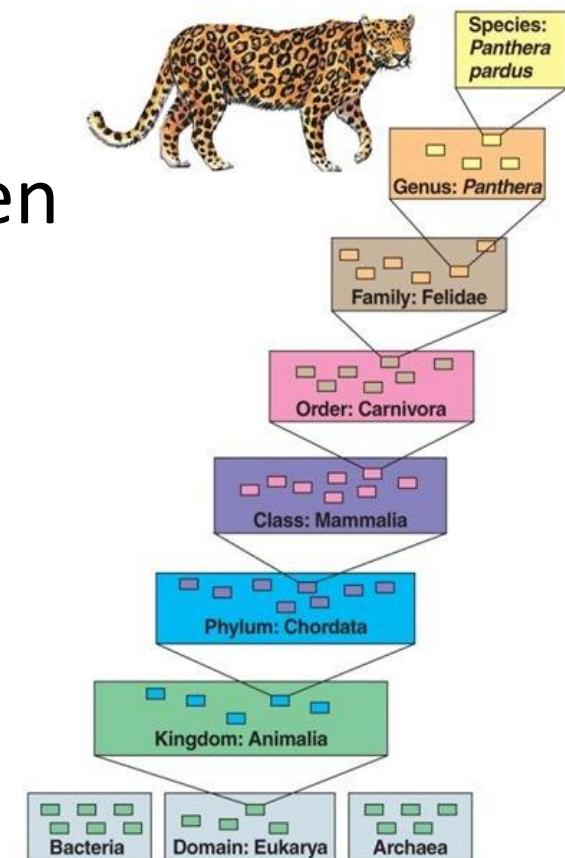
offspring.

man.

deer.

deer.

building.



5 Definition Types

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- Lexical
- Precising
- Theoretical
- Persuasive

definition
defə'niSH(ə)n

noun

a statement of the exact meaning of a word,
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What is your favorite manga, movie, book, TV show?

1. Write 2 premises and conclusion stating that your choice is the best choice.
2. Add a needed definition and name the definition type
3. Identify the definition technique

(Demonstrative, Enumerative, Subclass, Synonymous, Etymological, Operational, Genus & Difference)

Example:

- C: Dune is the best movie in the sci-fi genre.
- P1: Dune uses the an optimally effective soundtrack with exquisite composition and soundscapes.
- P2: Soundscapes comprise the sounds heard in a particular location, helping to illustrate the setting. (**Lexical – Intensional: synonymous**)
- P3: The storyline is complex and engages the audience's full attention.

8 Rules of Lexical Definitions

Rule 1: Use Proper Grammar



Furious means if your angry at someone.



“Furious” means a condition of being very angry.



8 Rules of Lexical Definitions

Rule 1: Use Proper Grammar

Rule 2: Express the essential meaning

Rule 3: Avoid being too broad and too narrow

Rule 4: Avoid circular definitions

Rule 5: Avoid negative states

Rule 6: Avoid figurative, obscure, vague, or ambiguous language

Rule 7: Avoid emotional or biased language

Rule 8: Indicate context if there are multiple meanings



8 Rules of Lexical Definitions

Rule 2: Express the essential meaning



A “Chair” is an item made of wood with four legs.



A “Chair” is furniture used for sitting, typically having four legs.

8 Rules of Lexical Definitions

Rule 3: Avoid being too broad and too narrow



Broad: A “bird” is a warm-blooded animal having wings.



Narrow: A “bird” is a flying and egg-laying animal.



A “bird” is a bipedal, feathered, egg-laying animal.



8 Rules of Lexical Definitions

Rule 4: Avoid circular definitions



“Science” means the activity engaged in by scientists.
“Scientist” means anyone who engages in science.



“Soporific” means soporiferous.

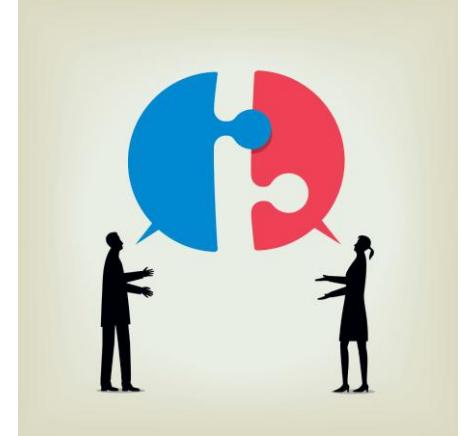


8 Rules of Lexical Definitions

Rule 5: Avoid negative states



“Concord” means the absence of discord.



“Concord” means harmony.

“Bald” means the absence of hair.



8 Rules of Lexical Definitions

Rule 6: Avoid figurative, obscure, vague, or ambiguous language



Figurative: “Tuna” is the chicken of the sea



Obscure: “Bunny” means a mammalian of the family Leporidae of the order Lagomorpha.



Vague: “Democracy” means a kind of government where the people are in control.



Ambiguous: “Triangle” means a figure composed of three straight lines in which all the angles are equal to two right angles.

8 Rules of Lexical Definitions

Rule 7: Avoid emotional or biased language



“Communism” is a brilliant invention of Karl Marx and other foolish political visionaries in which the national wealth is supposed to be held in common by the people.



“Theism” means belief in that great Santa Claus in the sky.

8 Rules of Lexical Definitions

Rule 8: Indicate context if there are multiple meanings



In baseball, a “strike” is a ball thrown to a catcher, where the batter swings and misses, or passes over the strike zone.



In bowling, a “strike” is the act of knocking down all 10 pins with the first ball of a frame.



In fishing, a “strike” is when a fish bites at the bait.



What was all that?

Language

Best practices in using these

Meaning

How these affect arguments

Definition

How to evaluate good/bad arguments

What is your favorite manga, movie, book, TV show?

1. Write 2 premises and conclusion stating that your choice is the best choice.
2. Add a needed definition and name the definition type
3. Identify the definition technique
4. Evaluate your argument based on the 8 Rules

Example:

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P1: Dune uses the an optimally effective soundtrack with exquisite composition and soundscapes.

P2: Soundscapes comprise the sounds heard in a particular location, helping to illustrate the setting. (Lexical – Intensional: synonymous)

P3: The storyline is complex and engages the audience's full attention.

Evaluation:

Optimal is subjective and requires definition

Exquisite is potentially too emotional or biased