

Semantics

"Don't argue over semantics." ??

What does it mean? शब्दों का अर्थ

- Study of the meaning of words, phrases, & sentences.
- Semantic analysis
 ↓
 conventional meaning of linguistic forms, not necessarily what an individual thinks or intends
 that is a shared meaning across all speakers of a language competent

Different types of meaningReferential meaning

- Basic, essential components of meaning
- literal use of the word
 e.g. श्वेत means the animal that has four limbs and a tail and is a primate, likes banana, associated with Hanuman etc.

Associative meaning

- The word श्वेत can mean different things to different people.
- It is associated to persons who destroy other's property, or to someone who doesn't do one's job in time, or may be associated with Hanuman, etc.
- Such meanings are not referential, but associative.

Semantic feature

actress: [+female] [+performer]

- Basic element of a word ^{by} [+animate] [+domesticated] [-wild] [-feline]
- More precisely: component of a concept that is associated with any grammatical unit like word

example: ① cat

[+animate] [+domesticated] [feline]

② leopard

[+animate] [-domesticated] [feline]

③ actor

[+male] [+performer]

Can you expand the list of features?

- To understand word meaning
- Mental representation of words - tagging
- NLP & AI

- compare meaning mathematically
- cluster related concepts
- model semantics in AI / LLM

Vector space of semantic feature

feature	man	woman	♂ dog	♀ cat
[+human]	1	1	0	0
[+female]	0	1	0	1
[+animal]	0	0	1	1

man: [1,0,0] woman: [1,1,0] dog: [0,0,1] cat: [0,1,1] ← 3-D space

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Lexical relations

- The relationships of meaning between words
- Words are described not in terms of their component features, but in terms of the relationship with other words
 - Synonymy • Homonymy • Homophony • Antonymy • Polysemy

* **Synonymy**: synonyms, e.g. big / large / huge, funny / comical
• often can be replaced one for the other, but not always

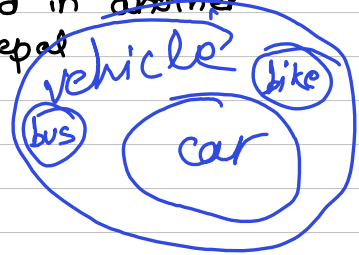
* **Antonymy**: antonyms, e.g. girl / boy, live / die, high / low
• one means the opposite of the other

- Gradable: tall / short, sad / happy
- Non-gradable: yes / no, alive / dead } aka complementary pairs
- Reversives: dress / undress, rise / fall, pack / unpack, enter / exit
↳ "do the opposite of"

* **Hyponymy**: meaning of one form included in another
vehicle / car, animal / tiger, country / Nepal

↳ car is a hyponym of vehicle

- Co-hyponyms: car, bus, bike
- Superordinate: vehicle, animal, country



* **Prototype**: "a characteristic instance"

↳ helps explain the meaning of certain word(s) / category

e.g. sparrow is a prototype of bird, but ostrich is not
t-shirt is a prototype of clothing, but shoes is not

* Homophones: different forms, same pronunciation, most likely different meanings
e.g. to/too/two, pale/pail, meat/meet,
right/write, flour/flower

* Homonyms: same form, same pronunciation, different meaning
e.g. bank (financial institution)
bank (riverside)

mole (on skin) - mole (small animal)

race (contest of speed) - race (ethnic group)

bat (flying creature) - bat (used in sports)

• Homonyms have separate histories and meanings, no connection.

• Separate dictionary entries

* Polysemy: same form, related meanings
e.g. head

• a part on top of the body

• froth on top of a beer glass

• person at the top of a company

• Single dictionary entry with multiple meanings listed

* Metonymy: a figure of speech

an object/concept is referred to by something that is closely related — content-container relation, whole-part relation, or a representative-symbol relation.

e.g. bottle/water, house/roof, the PM / ^{the} Singhadurbar
kettle/water car / tank

* Metaphor: a figure of speech in which a term is transferred from the object it ordinarily designates to an object it may designate only by implicit comparison or analogy
e.g. ^{दोपहर} ^{उज्ज} ^{हु} | dawn of her career

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Sentence level

* Entailment

p: Cat killed rat.

q: Rat died.

	p	q
i	T	\rightarrow T
ii	F	\rightarrow T or F
iii	F	\leftarrow F
iv	T or F	\leftarrow T

i) When p is true, q is true.

ii) When p is false, q can be true or false.

iii) When q is false, p is false.

iv) When q is true, p can be true or false.

a square $\xrightarrow{\text{entails}}$ a rectangle

not square \nrightarrow not rectangle

* Equivalence

A and B are in equivalence relⁿ if they entail each other

e.g. [John fucked Mary.]
[Mary fucked John.]

[Ram owns this book.]
[This book belongs to Ram.]

* Contradiction

A and B are in contradiction if each entails that the other is false, i.e. A entails the negation of B or vice versa.

e.g. No one is happy.

Someone is happy.

* Presupposition

- embedded assumption is the sentence
- The presupposition remains despite negation

The moon in my pocket is glowing hot.

The moon in my pocket is not glowing hot.

↳ "there is a moon in my pocket"

↳ may or may not be true → we are making supposition

Is the moon in my pocket glowing hot?

P: The emperor of Mars is my friend.

Q: There is an emperor of Mars.

	P	Q
i	T	→ T
ii	F	→ T
iii	T or F	→ T

* Presupposition failure

"Have you stopped bunking classes on Mondays?"

- no good answer to it

* Implicature → we'll see in Pragmatics

- not an entailment but inference you draw

eg. "Can you pass me the pen?"

implicature: The speaker wants you to pass her the pen.

Teaser for the next class:

- I'm glad I'm a man, and so is Lola.
- I saw her duck.
- Everyone in this class speaks at least two languages.
- I shot an elephant in my pyjamas.

Ambiguity

- if you can infer more than one plausible meaning
- can arise at different levels from phonetics to ^{morphology,} semantics, syntax

① Lexical ambiguity ← Semantic ambiguity

- when a word (or morpheme) is ambiguous

* polysemy * homonym * homophony

e.g. He likes it because of its bark.

No dear! I can't get you a bad!

I saw her duck. He kicked the bucket.

② Scope ambiguity ← Syntactic ambiguity...^{more} later

Every teacher has a favorite student.

inverse scope: One student who is liked by all teachers.

surface scope: All teachers have at least one student they like, not necessarily the same student.

From previous class: What's the gender of a table?

	the sun:	el sol ^M	:	die Sonne ^F
N	the moon:	la luna ^F	:	der Mond ^M
	the table:	la mesa ^F	:	die Tabelle ^F der Tisch ^M
M	the boy:	el niño ^M	:	der Junge ^M
F	the girl:	la niña ^F	:	das Mädchen ^N
	the woman:	la mujer ^F	:	die Frau ^F

Syntax

- the rules that govern how words can be combined to form phrases and sentences

Karna constructed a chariot.

vs.

Constructed Karna chariot a.

- The rules to form a sentence refer to categories or types of words (e.g. nouns, verbs), not specific words themselves (e.g. Karna, created).

For example: "A sentence can be created from a noun and a verb." instead of "... from Karna and constructed"

- Generality of syntactic rules

- once speakers of a language know the category of a word, they can form a sentence using that word following the rule that ^{word}category follows

e.g. if told that "nostalizole" is a new medicine recently discovered, a new sentence can be formed as follows:

- If you have an upset stomach, take a capsule of nostalizole before meal.

- Syntactic categories (or parts of speech; pos)

Noun (N), Verb (V), Adjective (A), Determiner (D), and Preposition (P) \Rightarrow major word categories

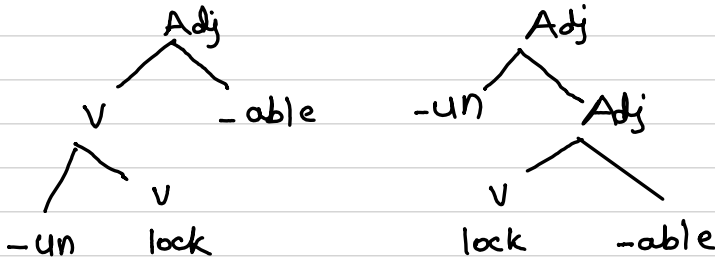
Other:

Degree words (Deg): too, so, very, much, quite

Auxiliary (Aux): will, could, must, be, have, do

Conjunction (Con): and, or, but, nonetheless, however

unlockable \Rightarrow unlock + able
 \Rightarrow un + lockable



i.e. "unlockable" is not ^{just} a series of 3 morphemes, it's how they are arranged and interpreted.

Similarly, in sentences, they're not just sequences of words, but how they are assembled and interpreted.

- Madan walked up the hill.
- Muna looked up the dictionary.

Meaningful — familiar — Let's go to the dance floor.
 — unfamiliar — Their cockroach is ^{dancing} on a hot air balloon

Impossible — Let's the dance floor go to.

- not about memorising ^{past sentences} or ^{their} meanings
 (see categories y'day)

It's not about meaning. Where does meaning come from?

- Colorless green ideas sleep furiously.
- Green ideas furiously sleep colorless.

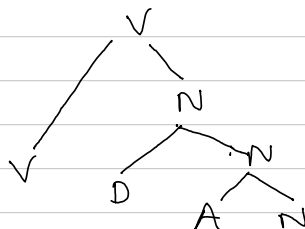
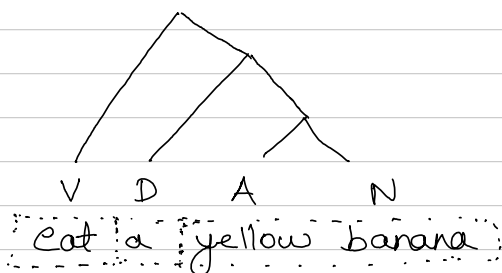
Competence vs Performance

- Let's the dance floor go to.

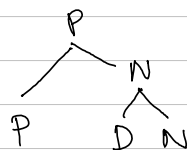
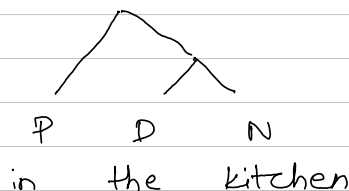
Normally people don't speak in full sentence, paragraph.
There are pauses and fillers. (except Noam Chomsky lol)
i.e. Performance

- Let's go to the dancefloor.
- Let's go to the dancefloor and spend the night dancing.
- She says, "Let's go to the"
- In my imagination, she says, "..."

This can go on and on to infinity
i.e. Competence



You should eat a yellow banana in the kitchen.



I'll walk up the stairs.

I'll wake up the kids.

Phrase structure & Phrase structure rules

PS: The way parts of sentences/phrases are organised and related to one another

- a concept closely related to Chomsky's Transformational Generative Grammar

PS rules: describe the syntax of a language, how the constituent parts of the phrases are organized

⇓
syntactic categories, including lexical and phrasal categories

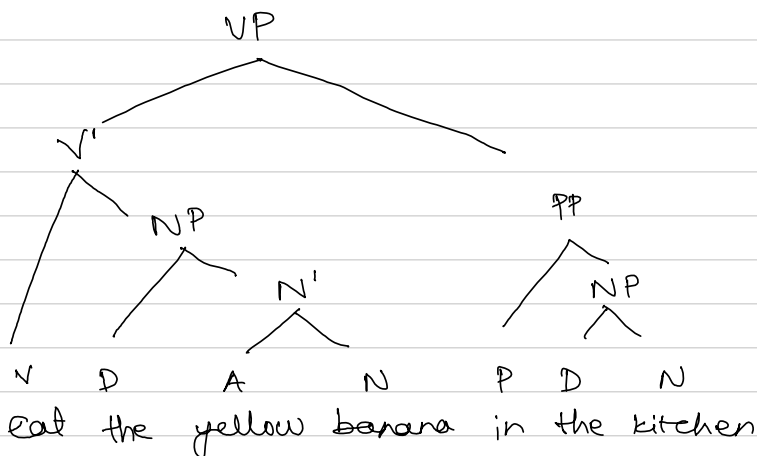
e.g. $S \rightarrow NP VP$

i.e. A sentence consists of a noun phrase and a verb phrase.

$NP \rightarrow (Det) N_1$

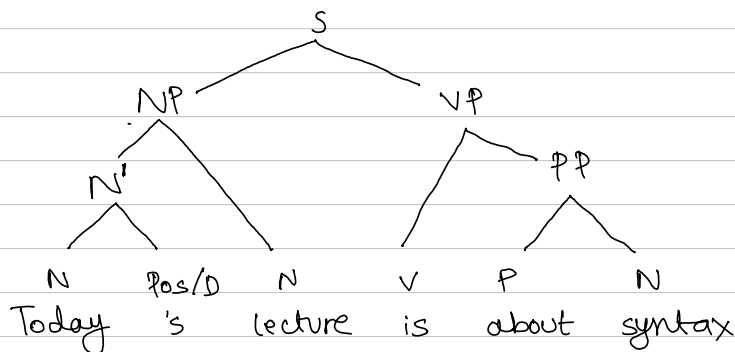
$N_1 \rightarrow (AP) N_1 (PP)$

where the constituents in round brackets are optional.



* highest node with a given label \rightarrow Phrase (VP, NP, PP)

- In the example above, PP is modifying a VP.
- Below, VP modifies a NP:



- NP can contain PP; PP can contain NP.
(Lecture about syntax) (In the morning)

Recursion

\hookrightarrow because NP can contain PP which can contain NP, sentences can become infinitely long.



competence

But are they? \Rightarrow performance

Topicalization

- A method of establishing an expression as the topic of a sentence (or clause) by moving it to the front of the sentence rather than in its standard position in the later part of the sentence.

- movement of determiners, prepositions, verbs

- whatever can be topicalized is considered "constituent"

e.g.: She gave him an apple → An apple she gave him.

They work for money. → For money, they work.

She works hard despite her illness. → Despite her illness she works hard.

Can I have that pie? → That pie, can I have?