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Introduction to Linguistic Theory

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**The Meaning of
Language**

The Meaning of Language

- When you know a language you know:
 - When a word is meaningful or meaningless, when a word has two meanings, when two words have the same meaning, and what words refer to (in the real world or imagination)
 - When a sentence is meaningful or meaningless, when a sentence has two meanings, when two sentences have the same meaning, and whether a sentence is true or false (the **truth conditions** of the sentence)
- **Semantics** is the study of the meaning of morphemes, words, phrases, and sentences
 - **Lexical semantics**: the meaning of words and the relationships among words
 - **Phrasal** or **sentential semantics**: the meaning of syntactic units larger than one word

Truth

- **Compositional semantics:**
formulating semantic rules that build the meaning of a sentence based on the meaning of the words and how they combine
 - Also known as **truth-conditional semantics** because the speaker's knowledge of truth conditions is central

Truth

- If you know the meaning of a sentence, you can determine under what conditions it is true or false
 - You don't need to know whether or not a sentence is true or false to understand it, so knowing the meaning of a sentence means knowing under what circumstances it would be true or false
- Most sentences are true or false depending on the situation
 - But some sentences are always true (**tautologies**)
 - And some are always false (**contradictions**)

Entailment and Related Notions

- **Entailment:** one sentence entails another if whenever the first sentence is true the second one must be true also

Jack swims beautifully.
entails
Jack swims.

but

Jack swims
does not entail
Jack swims beautifully

- When two sentences entail each other, they are **synonymous**, or **paraphrases**

Jack postponed the meeting

Jack put off the meeting

- When one sentence entails the negation of another sentence, the two sentences are **contradictions**

Jack is alive

Jack is dead

Ambiguity

- Our semantic knowledge also tells us when words or phrases have more than one meaning, or are ambiguous
 - Syntactic ambiguity arises from multiple syntactic structures corresponding to the same string of words
 - The boy saw the man with the telescope
 - Lexical ambiguity arises from multiple meanings corresponding to the same word or phrase
 - This will make you smart

Compositional Semantics

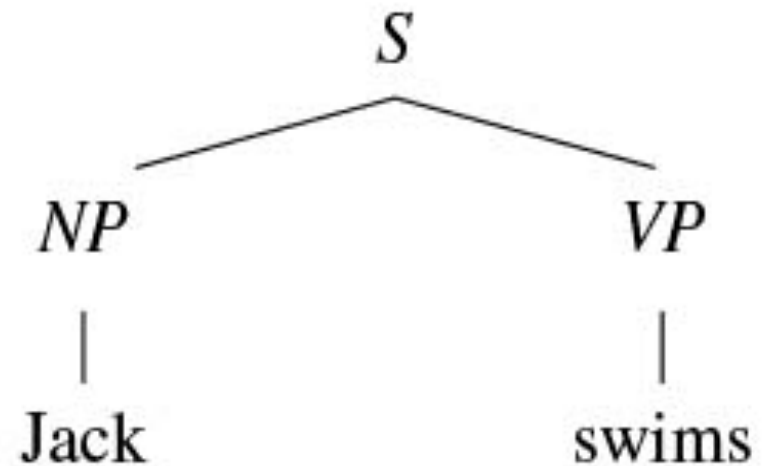
- Compositional semantics: to account for speakers' knowledge of truth, entailment, and ambiguity, we must assume that grammar contains semantic rules for how to combine the meanings of words into meaningful phrases and sentences
 - The **principle of compositionality** asserts that the meaning of an expression is composed of the meaning of its parts and how the parts are combined structurally

Compositionality as set intersection

- [NP Blue books]
 - Blue set of everything blue
- Books
 - Set of all books
- $\text{Blue} \cap \text{Books} = [\text{NP Blue books}]$
- Verbs are more complex they map relationships

Semantic Rules

- **Semantic Rule I:** if the meaning of NP (an individual) is a member of the meaning of the VP (a set of individuals), then S is TRUE, otherwise, it is FALSE



Word

Meaning

Jack

refers to the individual Jack

swims

refers to the set of individuals that swim

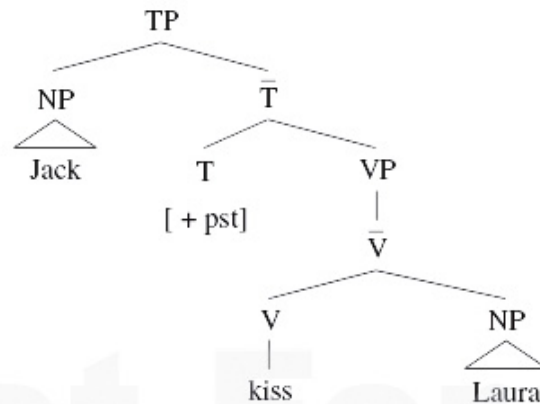
- If the NP, Jack, is among the set of individuals that swims (the VP) then the sentence is TRUE

Semantic Rules

- Jack kissed Laura.

Word	Meanings
<i>Jack</i>	refers to (or means) the individual Jack
<i>Laura</i>	refers to (or means) the individual Laura
<i>kissed</i>	refers to (or means) the set of <u>pairs of individuals</u> X and Y such that X kissed Y.

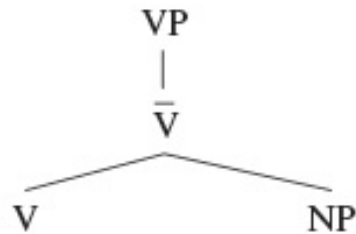
Here is the phrase structure tree:



Semantic Rules

Semantic Rule II

The meaning of

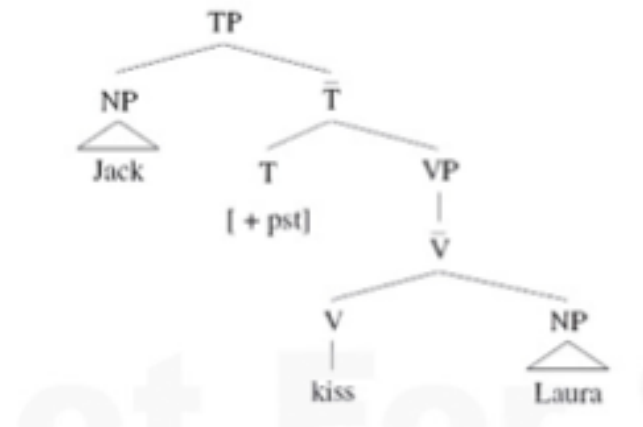


is the set of individuals X such that X is the first member of any pair in the meaning of V whose second member is the meaning of NP .

- If the NP Jack is among the set of people who kissed Laura (the VP), then the sentence is TRUE

Semantic Rules

- The meaning of the sentence Jack kissed Laura is first derived by applying Semantic Rule II, which establishes the meaning of the VP (establishes the set of people who kissed Laura)



- Then, Semantic Rule I applies to determine the meaning of the entire sentence (establishes whether or not Jack in particular is in the set of people who kissed Laura)

When Compositionality Goes Awry: Anomaly

- An **anomalous** sentence:
Colorless green ideas sleep furiously
- This sentence is syntactically fine, but contains semantic violations such as describing ideas as both colorless and green
- Other sentences are **uninterpretable** because they include nonsense words:
He took his vorpal sword in hand

When Compositionality Goes Awry: Metaphor

- **Metaphors** are sentences that seem to be anomalous but are understood in terms of a meaningful concept
- To understand a metaphor we must understand the individual words, the literal meaning of the expression, and facts about the world
 - To understand Time is money you need to know that in our society people are often paid according to the amount of time worked

When Compositionality Goes Awry: Idioms

- **Idiomatic phrases** are phrases with meanings that cannot be predicted based on the meanings of the individual words

- The usual semantic rules for combining meanings do not apply

drop the ball

put his foot in his mouth

hit it off

- All languages have idioms, but idioms are rarely directly translatable

kick the bucket (animal) leg” = estirar la pata “to stretch the

Lexical Semantics: Reference

- **Referent:** the real-world object designated by a word
 - Jack, the happy swimmer, my friend, and that guy can all have the same referent in the sentence Jack swims.
 - But, some NPs do not refer to any particular individual, such as: No baby swims.
 - While the happy swimmer and Jack may refer to the same individual in some cases, the happy swimmer means something extra:
 - The happy swimmer is happy.
 - Jack is happy.

Lexical Semantics: Sense

- **Sense:** an element of meaning separate from reference and more enduring; the manner in which an expression presents the reference
 - Barack Obama
 - The President
 - Michelle Obama's husbandThese have the same reference but different senses
- The word unicorn has sense but no reference
- Proper names tend to have reference but no sense
 - Sometimes two proper names have the same referent (Unabomber & Ted Kaczynski); these pairs of nouns are called **coreferential**

Lexical Relations: Synonyms

- **Synonyms:** words or expressions that have the same meaning in some or all contexts
 - apathetic, indifferent sofa, couch
- Some assert that there are no two words with exactly the same meanings
- After the Norman invasion of England in 1066, many French words of Latin origin entered the language, giving rise to synonymous pairs:
 - English: heal Latin: recuperate
 - English: send Latin: transmit

Lexical Relations: Antonyms

- **Antonyms** are words that are opposite in meaning
 - **Complementary antonyms:**
 - alive/dead, present/absent, awake/asleep
 - alive = not dead, dead = not alive
 - **Gradable pairs:** no absolute scale
 - big/small, hot/cold, fast/slow, happy/sad
 - Some pairs of gradable antonyms contain a **marked** and an unmarked term, with the **unmarked** term being the one used in questions of degree:
 - How high is the mountain? not How low is the mountain?

Lexical Relations: Antonyms

- **Relational antonyms:** display symmetry in their meaning
 - give/receive, buy/sell, employer/employee
- “Autoantonyms” or “contranymy” are words that are their own antonym
 - dust = to remove small particles
 - dust = to scatter small particles

Lexical Relations

- **Homonyms (or homophones):** words that have different meanings but are pronounced the same: bear and bare
 - **Homographs** are words that are spelled the same: bear and bear, dove and dove
 - **Heteronyms** are words that are spelled the same but pronounced differently: dove and dove

Lexical Relations

- **Polysemous** words are words with multiple, conceptually or historically related meanings
 - diamond: the geometric shape; a baseball field
- **Hyponyms** involve the relationship between a general term and specific instances of that term
 - rose, iris, daisy, and poppy are all a kind of flower, so rose, iris, daisy, and poppy are all **hyponyms** of the word flower

Semantic Features

- Semantic features are properties that are part of word meanings and reflect our knowledge about what words mean
 - For example, antonyms share all but one semantic feature
 - big has the semantic feature “about size” and red has the semantic feature “about color,” so the two cannot be antonyms
 - The semantic features of the word assassin include that assassins must be human and kill important people

Evidence for Semantic Features

- Speech errors, or “slips of the tongue” provide evidence for semantic features because the accidentally uttered word shares semantic features with the intended word:

Intended Utterance

bridge of the nose
when my gums bled
he came too late
Mary was young

Actual Utterance (Error)

bridge of the neck
when my tongues bled
he came too early
Mary was early

- Here nose, neck, gums, and tongues all share the property of being body parts or parts of the head; early, late, and young all have to do with time

Semantic Features of Nouns

- Some languages have **classifiers**, or grammatical morphemes that indicate the semantic class of the noun
 - Swahili has one set of singular and plural markers for nouns that have the semantic feature “human” and another set for those that don’ t
- In English the type of determiner that accompanies a noun depends on whether it is a **count noun** (can be enumerated and pluralized) or a **mass noun** (cannot be enumerated or pluralized)
 - Count nouns such as dog and potato can be counted and pluralized (I have two dogs)
 - Mass nouns such as rice and water cannot be pluralized or counted (*I have two rices) and do not take the article a (*I have a rice)

Semantic Features of Verbs

- Verbs also have semantic features attached to them
 - darken includes the semantic feature “cause” , as does kill and uglify
 - break can be analyzed as follows:
“cause” to “become” broken
- The semantic features of verbs can also have syntactic consequences

Semantic Features of Verbs

- Verbs can describe events (eventives) or states (statives), and these verbs affect the possible sentence structures:
 - Eventive sentences sound good when passivized, put in the progressive, used as imperatives, and with certain adverbs:

Eventive: Oysters were eaten by John Eventive: John is eating oysters

Statives: ?Oysters were liked by John Stative: ?John is liking oysters

Eventive: John deliberately ate oysters Eventive: Eat oysters!

Stative: ?John deliberately liked oysters Stative: ?Like oysters!

Argument Structure

- Different kinds of verbs take a different number of NPs as **arguments**—each verb takes a subject and:
 - Intransitive verbs such as sleep take no other arguments
 - Transitive verbs such as find take an additional argument (a direct object)
 - Ditransitive verbs such as give take two additional arguments (direct and indirect objects)
- The verb also determines the semantic properties of all the arguments
 - Verbs such as find and sleep require human subjects
 - Verbs such as drink require a liquid direct object

Thematic Roles

- **Thematic roles** express the relation between the arguments of the verb and the situation the verb describes
 - **Agent**: the ‘doer’ of the action
 - **Theme**: the ‘undergoer’ of the action
 - **Goal**: the endpoint of a change in location or possession
 - **Source**: where the action originates
 - **Instrument**: the means used to accomplish an action
 - **Experiencer**: one receiving sensory input

Thematic Roles

- Thematic roles remain the same in paraphrases because the thematic roles are in their proper place in deep structure

The dog bit the stick
by the dog

agent
agent

theme

The stick was bitten

theme

Pragmatics

- **Pragmatics** is concerned with our understanding of language in context
 - Linguistic context: the **discourse** that precedes the phrase or sentence to be interpreted
 - Situational context: everything nonlinguistic in the environment of the discourse

Other thematic roles (from Luca)

- Experiencer: NP that receive sensory or emotional input
 - He impressed Mary
- Instrument: NP instrument used to do the action (usually preceded by “with”)
 - The bunny killed my friend with a saw
- Source: NP that describe the origin of the action (usually preceded by “from”)
 - He knows it from the newspaper
- Goal: NP that defines the goal of an action (usually preceded by “in, into, towards, to”)
 - He put the ball in the net
- Location: NP that defines the location of an action
 - He slept in New York

Deixis

- **Deixis** refers to words and expression whose reference depend on the situational context
 - **Person deixis:** I, you, she, that man, those girls
 - The meaning depends on who is present or being discussed
 - **Time deixis:** now, then, tomorrow, yesterday
 - The meaning depends on when the utterance was said or what period of time is being discussed
 - **Place deixis:** here, there, yonder mountains
 - The meaning depends on where the utterance was said or what place was being discussed

Pronouns and Linguistic Context

- Pronouns get their meaning from other NPs in the sentence or discourse
 - Any NP that a pronoun relies on for its meaning is called an antecedent
- Reflexive pronouns always depend on an antecedent in the same clause for its meaning
 - John bit himself *John said that the girl bit himself
 - *Himself left
- Regular pronouns cannot refer to an antecedent in the same clause
 - John knows him (him cannot refer to John)
 - John knows that he is a genius (he can refer to John or someone else)

Implicatures

- **Implicatures** are inferences that may be drawn from an utterance based on context
 - SUE: Does Mary have a boyfriend?
 - BILL: She' s been driving to Santa Barbara every weekend.
 - Bill asserts that Mary drives to Santa Barbara every weekend and implicates that she has a boyfriend living in Santa Barbara

Maxims of Conversation

- **Maxims of conversation** are conversational conventions that govern discourse:
 - **Maxim of Quality:** Truth
 - **Maxim of Quantity:** Information
 - **Maxim of Relation:** Relevance
 - **Maxim of Manner:** Clarity
- People tend to adhere to these maxims and expect others to do so also
 - Therefore, if someone suddenly says, “It’s cold in here” to someone standing by an open window, the listener can assume the speaker is violating the maxim of relevance, or she can assume that the utterance is relevant because the speaker would like the window closed

Speech Acts

- The study of **speech acts** describes how people do things with language
- **Performative** verbs: verbs that accomplish an action when they are uttered
 - When you say, I dare you you have said something and you have dared someone
 - Some performative verbs: bet, challenge, dare, fine, nominate, promise, resign
 - A test for performativity: performative verbs usually sound good when you add I hereby to the sentence:
 - I hereby resign
 - ?I hereby know you