

Three Perspectives on Meaning

1. Lexical Semantics

- The meanings of individual words

2. Formal Semantics (or Compositional Semantics or Sentential Semantics)

- How those meanings combine to make meanings for individual sentences or utterances

3. Discourse or Pragmatics

- How those meanings combine with each other and with other facts about various kinds of context to make meanings for a text or discourse
- **Dialog or Conversation** is often lumped together with Discourse

Some terminology

- Lemmas and wordforms
 - A **lexeme** is an abstract pairing of meaning and form
 - A **lemma** or **citation form** is the grammatical form that is used to represent a **lexeme**.
 - ***Carpet*** is the lemma for ***carpets***
 - Specific surface forms *carpets*, *sung*, are called **wordforms**
- The lemma *bank* has two **senses**:
 - Instead, a **bank** can hold the investments in a custodial account in the client's name
 - But as agriculture burgeons on the east **bank**, the river will shrink even more.
- A **sense** is a discrete representation of one aspect of the meaning of a word

Relationships between word meanings

- Homonymy
- Polysemy
- Synonymy
- Antonymy
- Hypernymy
- Hyponymy
- Meronymy

Homonymy

- **Homonymy:**
 - Lexemes that share a form
 - Phonological, orthographic or both
 - have unrelated, distinct meanings
 - Clear example:
 - Bat (wooden stick-like thing) vs
 - Bat (flying scary mammal thing)
 - Or bank (financial institution) versus bank (riverside)
 - Can be homophones, homographs, or both:
 - Homophones:
 - Write and right
 - Piece and peace

Polysemy

- The **bank** is constructed from red brick
I withdrew the money from the **bank**
- Are those the same sense?

Synonyms

- Word that have the same meaning in some or all contexts.
 - couch / sofa
 - big / large
 - automobile / car
 - vomit / throw up
 - Water / H₂O
- Two lexemes are synonyms if they can be successfully substituted for each other in all situations
- Consider the words *big* and *large*
- Are they synonyms?
 - How **big** is that plane?
 - Would I be flying on a **large** or small plane?
- How about here:
 - Miss Nelson, for instance, became a kind of **big** sister to Benjamin.
 - ?Miss Nelson, for instance, became a kind of **large** sister to Benjamin.
- Why?
 - *big* has a sense that means being older, or grown up
 - *large* lacks this sense

Antonyms

- Senses that are opposites with respect to one feature of their meaning
 - dark / light
 - short / long
 - hot / cold
 - up / down
 - in / out
- More formally: antonyms can
 - define a binary opposition or at opposite ends of a scale (*long/short, fast/slow*)
 - Be **reversive**: *rise/fall, up/down*

Hyponymy

- One sense is a **hyponym** of another if the first sense is more specific, denoting a subclass of the other
 - *car* is a hyponym of *vehicle*
 - *dog* is a hyponym of *animal*
 - *mango* is a hyponym of *fruit*
- Conversely
 - *vehicle* is a hypernym of *car*
 - *animal* is a hypernym of *dog*
 - *fruit* is a hypernym of *mango*

superordinate	vehicle	fruit	furniture	mammal
hyponym	car	mango	chair	dog

II. WordNet

In Nov. 2012, the database contains 155,287 words organized in 117,659 [synsets](#) for a total of 206,941 word-sense pairs; in [compressed](#) form, it is about 12 [megabytes](#) in size

- A hierarchically organized lexical database
- On-line thesaurus + aspects of a dictionary
 - Versions for other languages are under development

Category	Unique Forms
Noun	117,798
Verb	11,529
Adjective	21,479
Adverb	4,481

Format of Wordnet Entries

The noun “bass” has 8 senses in WordNet.

1. bass¹ - (the lowest part of the musical range)
2. bass², bass part¹ - (the lowest part in polyphonic music)
3. bass³, basso¹ - (an adult male singer with the lowest voice)
4. sea bass¹, bass⁴ - (the lean flesh of a saltwater fish of the family Serranidae)
5. freshwater bass¹, bass⁵ - (any of various North American freshwater fish with lean flesh (especially of the genus Micropterus))
6. bass⁶, bass voice¹, basso² - (the lowest adult male singing voice)
7. bass⁷ - (the member with the lowest range of a family of musical instruments)
8. bass⁸ - (nontechnical name for any of numerous edible marine and freshwater spiny-finned fishes)

The adjective “bass” has 1 sense in WordNet.

1. bass¹, deep⁶ - (having or denoting a low vocal or instrumental range)
*“a deep voice”; “a bass voice is lower than a baritone voice”;
“a bass clarinet”*

WordNet Hierarchies

Sense 3

bass, basso --

(an adult male singer with the lowest voice)

=> singer, vocalist, vocalizer, vocaliser

=> musician, instrumentalist, player

=> performer, performing artist

=> entertainer

=> person, individual, someone...

=> organism, being

=> living thing, animate thing,

=> whole, unit

=> object, physical object

=> physical entity

=> entity

=> causal agent, cause, causal agency

=> physical entity

=> entity

Sense 7

bass --

(the member with the lowest range of a family of musical instruments)

=> musical instrument, instrument

=> device

=> instrumentality, instrumentation

=> artifact, artefact

=> whole, unit

=> object, physical object

=> physical entity

=> entity

Meronymy

What is it?

It is a term used to describe a part-whole relationship between lexical items (single or group of words that convey a single meaning).

How to identify meronymy?

- **X** is a meronym of **Y** if **X** is a part of **Y**, or Y has X
- Example:
- Cover and page are parts of book, thus they are meronyms of book
- A finger is a part of a hand, thus *finger* is a **meronym** of *hand*
- *Nose is a meronym of face (necessary)*
- *Collar is a meronym of shirt (usual but not obligatory)*

Meronymy Vs hyponymy

- Hyponymy is always transitive, meaning that if an item is a part of a part, then that first item is part of the larger [whole](#).

Examples:

hawk is a hyponym of bird, and bird is a hyponym of animal, so hawk is a hyponym of animal

- Meronymy may or may not be transitive.

transitive example:

nail is a meronym of finger, and finger of hand, we can say that nail is a meronym of hand, for we can say hand has nails.

Intransitive example:

hole is a meronym of button, and button of shirt, but we can't say that hole is a meronym of shirt, for we can not say shirt has holes.