

IS 531 Document Storage & Retrieval

Chapter 5 Lexical Semantics

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To be Covered



- Words and Meaning
- Lexical Relations
- WordNet

Lexemes & Lexicons



- **Lexeme**: an entry in the lexicon that includes
 - an orthographic representation
 - a phonological form
 - a symbolic meaning representation or **sense**
- Examples of dictionary entries:
 - Red** ('red) **N**: the color of blood or a ruby
 - Blood** ('bluhd) **N**: the red liquid that circulates in the heart, arteries and veins of animals

Lexemes & Lexicons



- Can we get semantics directly from online dictionary entries?
 - Some are circular
 - All are defined in terms of other lexemes
 - You have to know something to learn something

- What *can* we learn from dictionaries?
 - Relations between words:
 - Oppositions, similarities, hierarchies

Homonymy



- **Homonyms**: Words with same form (orthography and pronunciation) but with different, *unrelated* meanings, or senses (multiple lexemes)
- Example
 - A **bank** of money
 - The **bank** of the river
 - He **lies** on his side
 - He **lies** about the last day
- Word sense disambiguation: find clues to resolve?

Polysemy



- Refers to a **word** that has two or more similar meanings (same lexeme)

Examples

- He rarely **serves** chicken in his restaurant.
 - He **serves** as an ambassador.
-
- So what's the difference between polysemy and homonymy?

Polysemy & Homonymy



■ Homonymy

- Distinct, unrelated meanings
- Coincidental similarity?
 - A **bank** of money
 - The **bank** of the river

■ Polysemy

- Distinct but related meanings
- idea **bank**, blood **bank**, **bank**
 - A **bank** of money
 - The blood **bank**

Synonymy



- **Synonymy**: different lexemes, same meaning
 - How **big** is that plane?
 - How **large** is that plane?
 - Sick = ill
 - Movie = film

Antonyms



- **Antonym**: is a word that means the opposite of another.
 - *fat* is an antonym of *thin*
- Antonyms made by adding the **prefix un-**
 - likely / unlikely
 - able / unable
 - fortunate / unfortunate
- Antonyms made by adding the **prefix non-**
 - entity / nonentity
 - conformist / nonconformist

Antonyms



- Antonyms made by adding the **prefix in-**
 - tolerant / **intolerant**
 - discreet / **indiscreet**
 - decent / **indecent**

Ambiguity: Which applications are affected?



- General semantic interpretation
- Machine translation
- Spelling correction
- Speech recognition
- Text to speech
- Information retrieval

Semantic Networks



Used to represent lexical relationships

■ WordNet

- Most widely used hierarchically organized lexical database for English

■ Synset

- Set of synonyms, a dictionary-style definition, and some examples of uses → a concept
 - Databases for nouns, verbs, and modifiers
- Applications can traverse network to find synonyms, antonyms, hierarchies,...
- Available for download or online use
 - <http://www.cogsci.princeton.edu/~wn>