Lexical Semantics
Week 2: Polysemy*

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1 Review: types of inference

1. Entailments

- some ways of characterising entailments:

  (1) A sentence $S$ entails a sentence $S'$ (write: $S \vdash S'$) if:
      a. the information conveyed by $S$ is contained in the information conveyed by $S'$ (i.e., $S$ does not convey anything that $S'$ does not also convey)
      b. any situation that can be described by $S$ can also be described by $S'$
      c. there is no possible context in which $S$ is true, but $S'$ is false

- entailment relates sentences but can be triggered by (associated with) specific words:

  (2) a. George Mallory managed to reach the top of Mount Everest.
      b. $\vdash$ George Mallory reached the top of Mount Everest.

  (3) a. Mallory failed to reach the top of Mount Everest.
      b. $\vdash$ Mallory did not reach the top of Mount Everest.

- negating an entailment is contradictory:

  (4) Mallory managed to reach the top of Mount Everest, #but he did not reach the top of Mount Everest.

So, if $S$ entails $S'$: $S$ and not-$S'$ will be a contradiction

*Notes adapted in large part from course notes by Beth Levin and Cleo Condoravdi.
2. Presuppositions

- (for now) a sentence $S$ has a presupposition $P$ if $P$ must be true for $S$ to be appropriate or interpretable.

\[(5) \quad \text{The King of Canada is bald.}\]

\[(5)\] doesn’t make sense, because there is no King of Canada.

- we can think of sentences with presuppositions as placing requirements on the context of utterance

- as a result, they can also tell us something about the context:

\[(6) \quad \text{My sister finally stopped smoking.}\]

- even if you don’t know my sister (or anything about her), you can conclude that she used to smoke
- if you know she never smoked, (6) doesn’t make sense

- presuppositions are like ‘hidden’ content; you can’t directly agree or disagree with them

\[(6) \quad \text{A: My sister finally stopped smoking.}\]

a. B: No, she didn’t. I saw her smoking five minutes ago.

b. B: No, she didn’t. ??She never smoked in the first place.

- presuppositions have certain projection properties:

  - we can use projection through negation to test for presupposition:

\[(7) \quad \text{a. Mallory realised he was talking to the Prime Minister.}\]

\[\rightarrow \text{Mallory was talking to the P.M.}\]

\[\text{b. Mallory did not realise he was talking to the Prime Minister.}\]

\[\rightarrow \text{Mallory was talking to the P.M.}\]

3. Implicatures

- implicatures are (often) context-dependent

  - if $S$ implicates $S'$, there may be contexts in which $S$ is true but $S'$ does not follow

\[(8) \quad \text{a. Some of the explorers reached the South Pole.}\]

\[\text{b.} \quad \sim \text{Not all of the explorers reached the South Pole.}\]

- implicatures are defeasible or cancellable: $S$ and not-$S'$ is not necessarily contradictory (though it might be surprising)

\[(9) \quad \text{Some of the explorers reached the South Pole; actually, all of them did!}\]
Note:

- these types of inferences are predictable and systematic
- in many cases, they follow from the meanings or particular features of individual words (despite relating sentences to one another)
- we’re interested in the properties of lexical items which give rise to these sentence-level behaviours and patterns
- this leads us to meaning relations between lexical items

2 Sense relations

Hypernymy, hyponymy:

(10)  
\[ \text{a. Dogs have four legs.} \]
\[ \text{b. \textit{\textparbox{1cm}{\quad⊢ Dachshunds have four legs.}}} \]

- the entailment in (10) holds because \textit{dachshund} specifies a particular type of dog; it’s a subcategory
  
  - \textit{dachshund} is a \textbf{hyponym} of \textit{dog}
  
  - \textit{dog} is a \textbf{hypernym} of \textit{dachshund} (also \textit{poodle, terrier, spaniel}, ...)

- More generally:

  (i) A lexical item \textit{a} is a \textbf{hypernym} of \textit{b} if (and only if) the meaning of \textit{a} is more general than the meaning of \textit{b} (\textit{includes, is a superset/superclass of})
    
    ∗ \textit{ingest} is a hypernym of \textit{eat, drink, smoke}

  (ii) An item \textit{a} is a \textbf{hyponym} of \textit{a'} if (and only if) the meaning of \textit{a} is more specific than the meaning of \textit{b} (\textit{is included in, is a subset/subclass of})
    
    ∗ \textit{walk} is a hyponym of \textit{locomote, move}

Synonymy

- two lexical items are synonyms if they have the same meaning/sense

- to be true synonyms, they should be fully substitutable:

  (11)  
  \[ \text{a. Mallory reached the top of Mount Everest} \]
  \[ \text{b. Mallory summited Mount Everest.} \]

(fully substitutable implies substitutable in all contexts: do reach the top and \textit{summit} have this property?)
• some examples might be pairs like truck/lorry and elevator/lift in British vs. American English, or soda/pop in American English - but we still get some information from one word that we don’t get from the other (e.g., geographical or cultural)

• the ‘opposite’ relation is **antonymy**, where negating a lexical item allows it to be replaced by another:

  (12)  
  a. Mallory is not tall.  
  b. Mallory is short.  

  (but, are these really the same in meaning?)

• (13a) and (13b) seem interchangeable in most contexts: what about (14a) and (14b)? Why are these different?

  (13)  
  a. I’m not happy.  
  b. I’m unhappy.  

  (14)  
  a. I’m not unhappy.  
  b. I’m happy.

**Additional sense relations:**

• **meronym**: a is a meronym of b if a is a part of b

  - finger/hand, cover/book, leg/table

• **superordinate**: a is a superordinate of b if b is a kind of a

  - this is a particular type of hypernymy – dog is a superordinate and a hypernym of dachshund

• **co-hyponyms**: a and b are co-hyponyms if they share a superordinate

  - this does NOT make a and b synonyms

  - can you define synonymy in terms of hyper- and hyponymy? Why or why not?

3 **Ambiguity, senses, polysemy**

A word or expression is **ambiguous** if it can have more than one interpretation

• **structural ambiguity** (syntactic ambiguity) can be exploited for humour:

  (15)  
  This morning I shot an elephant in my pyjamas. How he got in to my pyjamas I’ll never know.  
  (Groucho Marx)  

  – the ambiguity has to do with what we think in my pyjamas modifies:
(16) This morning [I shot an elephant [in my pyjamas]] expected reading
(17) This morning [I shot an [elephant in my pyjamas]] odd, joke reading

- a recent example of ambiguity:

  "Hospitals named after sandwiches kill five."

- we’re interested in **lexical ambiguity**:
  - sometimes multiple meanings are (synchronously) accidental: *bank* of a river vs. blood *bank* (or *bank* in the financial sense)
    * this is a case of **homophony** (sometimes treated as polysemy as well)
    * homophones are simply sequences of phonemes with more than one independent (unrelated) lexical entry/lexeme
  - some ambiguities are cross-category:
    (18) I bank with a credit union.
    (19) My credit union is also a bank.
  - some words have ambiguities that seem only to be resolved in context:
    * how closely are different senses related?
    * what distinguishes them?
    * how many distinct meanings are there, and what drives them (if anything)?
  - we’ll distinguish words (nouns) with different **facets** (Cruse 1986, 1995) from cases of true **polysemy** (cf. Dölling)

### 3.1 Nouns with multiple facets

Cruse (1995, 2000, 2004) proposes that certain nouns have internally complex meanings:

- nouns with facets are complex in that they have two or more **discrete** subparts/subunits of meaning
• while discrete, these meanings are related in some inherent way (to some kind of core)

• how to properly analyze or represent this is an open question (see also Asher 2011, Pustejovsky 1991)

NOTE: These diagnostics are mentioned in the Cruse (1995) reading, but the notes here are drawn from a more detailed discussion in Cruse (2000) and later work. See Cruse (2004, Section 6.5.1) for additional diagnostics.

The most common example:

• book has at least two discrete facets, [TOME] (physical object) and [TEXT] (content, information)

• these facets are independent and can be talked about independently

• they are also both inseparably connected to the concept of book

• often we don’t realize that we are referring to both at once

3.1.1 Diagnostics for identifying discrete facets

• Distinct sense relations: discrete/distinct facets have their own hypernyms, hyponyms, and meronyms

(20) Sense relations for [TOME]:
   a. Meronyms: binding, cover, page, spine
   b. Hyponyms: hardback, paperback

(21) Sense relations for [TEXT]:
   a. Meronyms: paragraph, sentence, chapter, conclusion, introduction
   b. Hyponyms: biography, cookbook, dictionary, mystery, novel

• Independent truth conditions: It’s possible to come up with contexts where a particular word can be true (i.e. applicable) with respect to one facet and false with respect to the other.

(22) a. A: Do you like this book?
   b. i. B: Yes, it’s really gripping. [TEXT]
      ii. B: No, it’s shoddily bound. [TOME]

• Predicates referring to/selecting only one facet: Some verbs or adjectives refer to one of the facets, but not the other(s).

(23) a. [TOME] only: autograph, bind, close, open, remainder
   b. [TEXT] only: abridge, abstract, annotate, catalog, condense, index
• **Independent metaphorical extension:** Some metaphors build on one facet, but not the other(s).

  - metaphors are not systematic, so this is not a diagnostic that you’ll always be able to use

  (24)  
  a. [TOME] only: a book of matches, a book of stamps  
  b. [TEXT] only: book (i.e., libretto of an opera, musical, etc.)

3.1.2 Diagnostics for positing a unified meaning encompassing the facets

Normally, words such as book are used in ways that simultaneously evoke their multiple facets, and speakers and hearers are not explicitly aware of their independent existence.

Manifestations of this kind of unity:

• **Possibility of jointly attributing both facets to a word:** When a word has multiple facets, it is possible to find a single sentence with the word that involves comments on each facet separately, but simultaneously.

  - lying refers to [TOME], while fascinating refers to [TEXT]  
  - what suggests that book has one meaning (with facets) is the ability to refer to both aspects of meaning at once without oddness:

    (25) The book lying on the table is really fascinating.

• **Predicates simultaneously referring to multiple facets:** Some verbs or adjectives require all facets to be referred to at once, if they are to be used felicitously.

  (26) book as [TOME] and [TEXT]: borrow, publish, read

• **Joint sense relations:** Some words might have superordinates (hyponyms), co-hyponyms, or hyponyms that pick up on all the facets of their meaning at once.

  (27)  
  a. Superordinate of book as [TOME] and [TEXT]: publication  
  b. Co-hyponyms of book as [TOME] and [TEXT]: brochure, journal, newspaper, pamphlet

• **Joint metaphorical extension:** Some metaphors make reference to all the facets of a word’s meaning at once.

  (28) book as [TOME] and [TEXT]: Her mind is a closed book to me.
3.1.3 Nouns with multiple facets vs. polysemous nouns

Nouns which have a unitary meaning with multiple facets can be contrasted with truly polysemous nouns, which have multiple distinct meanings or senses:

(29)  
| a.  | *pen*: enclosure for animals or a writing implement |
| b.  | *bank*: a financial institution or the side of a river or other body of water |
| c.  | *bat*: an animal or a special piece of wood used to hit the ball in baseball |

- a key distinction: no single entity can capture both of these meanings at once – simultaneous reference is marked
- this is Cruse’s antagonism: the two meanings or senses stand in contrast to one another or are mutually exclusive
- attempts to put them together result in oddness: this oddness is known as **zeugma**

(30) ??She used the pen she built for the pig to draw a picture.

- some linguists distinguish the **homophones** in (29) from cases of polysemy
  - the idea is that homophony is accidental but polysemy involves some type of meaning connection or shared semantic field
  - e.g., *pen* vs. *branch*: a tree limb or part of an institution
  - while these cases might seem obviously different, it’s not always clear where to draw the line (cf. Dölling)

3.1.4 Other nouns with multiply-faceted meanings

- communication media in general: *brochure, record, CD, tape, video, DVD* (see also the assignment)

(31) Facets:
- [PHYSICAL FORM] \(\sim\) [TOME]
- [CONTENT] \(\sim\) [TEXT]

- organizations/institutions: *bank, factory, hospital, laboratory, museum*

(32) Facets:
- [PLACE]
- [PERSONNEL]
- [INSTITUTION]
3.2 Systematic polysemy

- The lexicon contains certain regularities between different senses for different lexical items
- In cases of systematic polysemy, senses are (often) disambiguated by the words around them (by selectional restrictions, for instance)
- patterns of systematic polysemy are usually cross-linguistically valid
- they point to more general patterns of conceptual relatedness (if they don’t, they can’t be systematic)

(33) a. Marin put a glass of wine on the table. (container of liquid) 
   b. Marin drank a glass of wine. (amount of liquid)

(34) Similar: *bottle, cup, pot, jar, bucket, barrel, spoon, . . .*

(35) German: *Flasche, Tasse, Topf, Kanne, Eimer, Fass, Löffel, . . .*

3.2.1 Patterns of systematic polysemy


- NB: Dölling treats some ofCruse’s facets as different senses. When we distinguish senses and facets, we’ll follow Cruse.

(36) **ANIMAL/FOOD**
   (e.g., chicken, lamb, rabbit, fish, salmon, octopus, crocodile)
   a. A chicken pecked the ground.
   b. Juno ate some chicken for dinner.

(37) **TREE/WOOD**
   (e.g., oak, cherry, elm, chestnut, birch, pine)
   a. The oak grew in the garden.
   b. The table is made of oak.

(38) **CONTAINER/CONTENTS** (see above)
   a. The man broke the bottle.
   b. The baby finished the bottle.

(39) **PHYSICAL OBJECT/APERTURE**
   a. The workman painted the window green.
   b. The children crawled through the window.

(40) **PHYSICAL OBJECT/INFORMATION**
   (e.g., book, dictionary, newspaper, map, letter, film, CD)

(41) **EVENT/INFORMATION**
   (e.g., lecture, speech, movie, play, opera)
a. The lecture took longer than expected.
b. The student found the lecture boring.

(42) **PHYSICAL OBJECT/INSTITUTION**
(e.g., bank, school, university, parliament, church, opera)
a. The bank has a good reputation.
b. The railway station is next to the bank.

(43) **EVENT/RESULT OBJECT**
(e.g., solution, illustration, construction, decoration, contribution)
a. Marin's solution to the problem took 20 minutes.
b. This solution is too difficult to understand.

### 3.2.2 Systematic polysemy versus metonymy

- systematic polysemy involves literal meaning; metonymy does not

(44) The ham sandwich is sitting at table 20.  
(45) The red shirts won the match.

- both Systematic polysemy and metonymy involve salient relations between distinct meanings, which derive from relations holding between elements of the respective domains.

- like systematic polysemy, metonymic interpretation is governed by a number of underlying patterns.
  - take an expression conventionally referring to objects as standing for persons using the objects (OBJECT/PURPOSE/USER)

- but polysemous lexical items have a fixed set of literal (or conventional) meanings, whereas metonymy is a non-literal use of expressions.
  - for sandwich, only the FOOD meaning of the noun but not its USER meaning is encoded in the lexicon.
  - metonymy is ‘productive’
  - systematic polysemy need not extend freely (at least synchronically)

- Dölling’s polysemy patterns are not homogeneous:
  - in some cases, there’s no obvious reason to think one sense is more basic (or one sense is derived): book, lecture, bank, window
    * neither the physical object meaning nor the information meaning of book can be viewed as more basic.
  - for nouns such as oak, bottle, solution we have a clear intuition that, even though each of the meanings the nouns have is literal, one of them is primary.
    * a historically metonymic origin is plausible/recoverable
3.2.3 Two types of systematic polysemy

- Systematically polysemous nouns can be divided into at least two groups: nouns where the related meanings are more or less of equal rank and nouns where one of them is basic.

  - in pairs where one is basic, they behave like ambiguous expressions under co-predication: we get zeugma
    
    (46) ??Juri fed and ate the chicken.
    [ANIMAL and FOOD]
    
    (47) ??The newspaper is printed on yellow paper and is full of coffee stains.
    [PUBLICATION and PHYS-OBJ]

  - in pairs where the senses seem equivalent, they don’t seem mutually exclusive, and co-predication is often fine:
    
    (48) Marin picked up and memorized the book.
    [PHYS-OBJ and INFO]

- these boundaries aren’t always clear:

  (49) The newspaper has been criticized by the opposition and publicly burned.
  [INST and PHYS-OBJ]

4 References


