

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) ?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) 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) 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) a. Mallory realised he was talking to the Prime Minister.

→ Mallory was talking to the P.M.

b. Mallory did not realise he was talking to the Prime Minister.

→ 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) a. Some of the explorers reached the South Pole.

b. $\sim\rightarrow$ 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) 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) a. Dogs have four legs.
b. \vdash Dachshunds have four legs.
- the entailment in (10) holds because *dachshund* specifies a particular type of dog; it's a subcategory
 - *dachshund* is a **hyponym** of *dog*
 - *dog* is a **hypernym** of *dachshund* (also *poodle*, *terrier*, *spaniel*, ...)
 - More generally:
 - (i) A lexical item *a* is a **hypernym** of *b* if (and only if) the meaning of *a* is more general than the meaning of *b* (*includes*, *is a superset/superclass of*)
 - * *ingest* is a hypernym of *eat*, *drink*, *smoke*
 - (ii) An item *a* is a **hyponym** of *a'* if (and only if) the meaning of *a* is more specific than the meaning of *b* (*is included in*, *is a subset/subclass of*)
 - * *walk* is a hyponym of *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) a. Mallory reached the top of Mount Everest
b. Mallory summited Mount Everest.

(fully substitutable implies substitutable in *all* contexts: do *reach the top* and *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:

- **meronymy**: *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:



- we're interested in **lexical ambiguity**:
 - sometimes multiple meanings are (synchronically) 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]:

- Meronyms:* binding, cover, page, spine
- Hyponyms:* hardback, paperback

(21) Sense relations for [TEXT]:

- Meronyms:* paragraph, sentence, chapter, conclusion, introduction
- 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: Yes, it's really gripping. [TEXT]
 - 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

- [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 (hypernyms), 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:

- a. [PHYSICAL FORM] ~ [TOME]
- b. [CONTENT] ~ [TEXT]

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

(32) Facets:

- a. [PLACE]
- b. [PERSONNEL]
- c. [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

From Dölling (collected from Pelletier & Schubert 1989, Krifka 1995, Chierchia 1998, Falkum 2010, 2011, and others):

- NB: Dölling treats some of Cruse'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. (Nunberg 1979)
 - (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

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