Lexical relations

Course
Semantics: The Structure of Concepts

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What is a word? 1

- Aitchison (1994: 34)
  There once was a fisher named Fisher
  Who fished for a fish in a fissure.
  But the fish with a grin
  Pulled the fisherman in
  Now they all fish the fissure for Fisher

Graphical (written) word: a sequence of letters that we write consecutively, with no spaces
Phonetic word: a sequence of sounds that we pronounce consecutively, with no pauses: but the fish, fissure = Fisher

Is it enough? What about meaning:
Too much meaning: raise you hands, how are you
No meaning: spimble, intafulation

Word: a combination of vocal sounds, or one such sound, used in a language to express an idea (to denote a thing, an attribute, a relation), and constitute an ultimate minimal element of speech having a meaning as such; a vocable.
What is a word? 2

• The same word?

n. *fish* vs. v. *fish* the same *lexical root*

n. *fisher* vs. v. *fish*

v. *fish* vs. *fished*

Word form – the inflected form of a word represented by a stem and a list of inflections to be attached: *fish, fishes, fished, fishing*, etc.

Lexeme – grouping of one or more word forms.

*fish, fishes, fished, fishing; house, houses;*

   lexeme 1  lexeme 2
Possible word? 1

Definition 1: A small pellet made out of mud and saliva which a bear inserts into his anus before hibernating for the winter, to stop the ants getting there

*tompion, tampion* [A plug for stopping an aperture]

Definition 2: To face west on a sunny morning while doing something quickly

????

Possible restrictions:

-utility

-culture-dependency: certain meanings need to be communicated (snow-terms in eskimo)
Possible word? 2

Structural constraints on lexicalization:

The woman drank the wine slowly

- drink+slowly: ok (compare: quaff, sip)
- drink+wine: ok (compare: drink = ‘drink alcoholic beverages’)

- the+woman+drank: bad
- the+wine+slowly: bad

The elements that constitute the meaning of a word must form a continuous dependency chain (must belong to the same constituent)
Lexical vs. grammatical meaning

- Not a clearcut dichotomy

Elements carrying each kind of meaning:

**Closed-set items:** grammatical meaning

The grammatical elements have to be *general* and *flexible* enough to be able to combine with a wide range of lexical roots. (Present-past-future go with almost the verbs, singular and plural with almost all the nouns, etc.)

**Open-set items:** lexical meaning

The lexical items (content words: nouns, verbs, adjectives and adverbs) do not have any restriction on the richness of their meaning.

The former are normally added to the latter.
Lexical vs. grammatical meaning 2

• ...more on closet-set items:
  - they belong to small substitution sets (≥1)
  - their principal functions is to articulate the grammatical structure of sentences
  - they change at a slow rate through time, so that a single speaker is unlikely to see loss or gain of items in his lifetime

• ...more on open-set items:
  - they belong to relatively large substitution sets (especially if semantic plausibility is ignored)
  - there is a relatively rapid turnover in membership of substitution classes, and a single speaker is likely to encounter many losses and gains in a single lifetime
  - their principal function is to carry the meaning of a sentence
Major problems of lexical semantics

1. Description of content: what is ‘the meaning of a word’ and how can we describe it? **Units of analysis**

2. Contextual variation: the semantic import of a single word form can vary greatly from one context to another. Variation is not random, there is always a pattern.

3. Sense relations and structures in the lexicon: regular patterns appear not only in the distribution of the meanings of a single word in different contexts, but also between different words in the same context. **Paradigmatic relations between words**

4. Word meaning and syntactic properties: to what extent the syntactic properties of words are independent of or controlled by their meaning?
Sense relations –
semantic relations between units of meaning

Types of sense relations:

- **syntagmatic**: hold between items which occur in the same sentence. **SYNTAX**
  
  *The girl thought across the field vs. The girl ran across the field*

- **derivational**: word families (*fish, fisher, fishy*) **MORPHOLOGY**

- **paradigmatic**: reflect the semantic choices available at a particular structure point in a sentence.

  *I’ll have a glass of ----- John ----- across the field*  
  
  beer  
  wine  
  water  
  lemonade  
  
  ran  
  walked  
  crawled
Types of paradigmatic lexical relations in terms of set-theoretical relations

• I. Identity: class A and class B have the same members

• II. Inclusion: class B is wholly included in class A

• III. Disjunction: class A and class B have no members in common
Identity: synonymy

• I. Identity: class A and class B have the same members

  A   B

  ▪ Narrow definition of synonymy: sameness of meaning
    Functionally unmotivated (introduces redundancy into language)
  ▪ Wider definition: synonyms are words whose semantic similarities are more salient than their differences
Absolute synonymy

- Absolute synonymy: complete identity of meaning
- In a contextual approach: **absolute synonyms are items which are equally normal in all contexts** (two lexical items X and Y can be considered absolute synonyms if in any context in which X is fully normal, Y is, too). **Contextual or syntactic approach**
  (i) brave : courageous
  *Billy was so brave at the dentist’s this morning.* (+)
  *Billy was so courageous at the dentist’s this morning.* (-)
  (ii) big : large
  *He’s a big baby, isn’t he?* (+) vs. *He’s a large baby, isn’t he?* (-)
  (iii) die : kick the bucket
  *Apparently he died in considerable pain* (+)
  *Apparently he kicked the bucket in considerable pain* (-)

Differentiating contexts may be harder to find for:
- sofa : settee; pullover : sweater
Propositional synonymy 1

• If two lexical items are propositional synonyms, they can be substituted in any expression with truth-conditional properties without effect on those properties.

*John bought a fiddle* entails and is entailed by *John bought a violin*

Differences in the meaning of propositional synonyms necessarily involve one or more aspects of non-propositional meaning:

(i) differences in expressive meaning
(ii) differences of stylistic level
(iii) differences of presupposed field of discourse

often related
Propositional synonymy 2

**fibula**
neutral in medical discourse

**shin**
no expressive loading as everyday term

**violin**
-neutral as everyday term for non-professionals

**fiddle**
-neutral for professional violinists
-colloquial for non-professionals

This was the first time they had had intercourse
This was the first time they had had made love
Thus was the first time they had fucked
(Cruse 2004)
Near-synonymy 1

- The language users do have intuitions as to which pairs of words are synonyms and which are not.
- What meaning differences do and which do not destroy synonymy?
- Can we say that there is a scale of semantic distance and that synonyms are words whose meanings are relatively close? Let us test it:

<table>
<thead>
<tr>
<th>entity</th>
<th>process</th>
</tr>
</thead>
<tbody>
<tr>
<td>living thing</td>
<td>object</td>
</tr>
<tr>
<td>animal</td>
<td>plant</td>
</tr>
<tr>
<td>animal</td>
<td>bird</td>
</tr>
<tr>
<td>dog</td>
<td>cat</td>
</tr>
<tr>
<td>spaniel</td>
<td>poodle</td>
</tr>
</tbody>
</table>

the words are semantically closer as we go down the list, but do they become more synonymous?
Near-synonymy 2

- Meaning differences that apparently do not destroy synonymy


- Certain adverbial specialization of verbs: amble:stroll, chuckle:giggle, drink:quaff;

- Aspectual distinctions: calm:placid (state vs. disposition)

- Difference of prototype center: brave (prototypically physical): courageous (prototypically involves intellectual and moral factors)

Can we background major distinction?

pretty (“female” presupposed) vs. handsome (“male” presupposed)

good-looking
Inclusion: hyponymy (hyperonymy) 1

II. Inclusion: class B is wholly included in class A

• Hyponymy can be paraphrased in ordinary language as X is a type/kind/sort of Y, where X is the hyponym of Y, and Y is the hypernym of X.

Ex.: *apple* is a *fruit*; *car* is a *vehicle*

• The class denoted by the hypernym includes the class denoted by the hyponym as one of its subclasses.

• Hyponymy defined in terms of entailment: the sentence containing the hyponym entails the one containing the hypernym:

  *It’s an apple* entails (but is not entailed by!) *It’s a fruit*
Inclusion: hyponymy (hyperonymy) 2

- Hyponymy as a hierarchy

```
Y (vehicle)  
/   
X1  X2  X3 (car)  
/ /   /   
X X X X X X (Ferrari, Lamborgini)  
```

co-hyponyms

hyperonym

hyperonym/hyponym

hyponym
Inclusion: hyponymy (hyperonymy) 3

Entailment is context independent, and human judgments on hyponymy are context sensitive.

*Dog:*pet is a good example of hyponymy?

*This is a dog* does not necessarily entail *This is a pet*.

DINGO
Inclusion: hyponymy (hyperonymy) 4

• **As a logical notion**, hyponymy is a transitive relation: if A is a hyponym of B, and B is a hyponym of C, then A is necessarily a hyponym of C.

  If A=spaniel, B=dog, C=animal, then

  *A spaniel is a (kind of) dog.*
  *A dog is an (kind of) animal.*
  *A spaniel is an (kind of) animal.*

But the transitivity in linguistic hyponymy does not hold always:

*A car-seat is a type of seat.*
*A seat is a type of furniture.*
*A car-seat is a type of furniture.*

A car-seat may not be a prototypical piece a furniture, and the linguistic intuition of the speakers is sensitive to this information.
Inclusion: hyponymy (hyperonymy) 5

- **Syntagmatic consequences of hyponymy**, expressions which prototypically require items related hyperonymously:
  
  apples and other fruit vs. ?fruit and other apples, ?apples and other pears
  
  Apples are my favourite fruit vs. ?Fruit are my favourite apples
Inclusion: meronymy (holonymy) 1

- Meronymy is the lexical reflex of the part-whole relation X is a part of Y, where X is the meronym of Y, and Y is the holonym if X.

Ex.:  
- hand:finger  
- teapot:spout  
- wheel:spoke  
- car-engine

Does entailment work with meronymy?

*This is a finger* does not entail *This is a hand*  
*But*  

If X is a meronym of Y, then for entity A, *A is in X* entails (but is not entailed by) *A is in Y.*

- John has a boil on his elbow entails John has a boil on his arm

There are a lot of exceptions though:

- The wasp is on the steering-wheel entails The wasp is IN the car  
- does not entail The wasp is ON the car
Inclusion: meronymy (holonymy) 2

Meronymy, even more strikingly than hyponymy, displays a prototypic character. What features contribute to the centrality of the concept in terms of meronymy?

✓ **Necessity**

Some parts are necessary to their wholes, whereas others are optional.

A beard is a part of the face, but it is not necessary to the face.

✓ **Integrality**

Some parts are more integral to their wholes than others. When we can say that a part is attached to the whole, its level of integration into whole is not very high:

The handle is a part of the door; The handle is attached to the door vs. The fingers are a part of the hand; ?The fingers are attached to the hand

✓ **Discreteness**

The more discrete (easily detachable) a part is, the more prototypical the relation is

The arm is more discrete with respect to the body that the tip of the tongue with respect to the tongue.
Inclusion: meronymy (holonymy) 3

✓ Motivation

Prototypical parts have an identifiable function with respect to their wholes. The handle of a door is for grasping and opening and shutting the door; the wheels of the car enable it to move smoothly over the ground, etc.

Are pieces a good example of parts? A piece of broken vase:
(a) Is it necessary? The criterion does not apply.
(b) Is it integral to the vase as a whole? It doesn’t apply (the unshattered whole vase has no pieces).
(c) Is it discrete? Pieces are discrete once they have been formed, but in the unbroken state of the whole they are not distinguishable, not discrete.
(d) Do they have a function with respect to the whole? No
Disjunction: incompatibility
c co-hyponymy 1

- III. Disjunction: class A and class B have no members in common

- Hypernym: $animal$

- Hyponyms: $dog$, $cat$, $mouse$, $lion$, $sheep$

If something is a mouse, then it is not a dog, horse or elephant: nothing in the world can belong simultaneously to the class of mice and the class of dogs.

Co-hyponymy in terms of features:

$horse = [animal][equine]$

$stallion = [animal][equine][male]$

$mare = [animal][equine][female]$

[male] and [female] are semantic features which cannot be simultaneously present.
This novel is a paperback.

Why is it acceptable? Are novel and paperback real co-hyponyms?

hyperonym: book (TOME)  hyperonym: book (TEXT)
hyponym: paperback, hardback  hyponym: novel, biography...
Disjunction: incompatibility
co-meronymy

• If X and Z are sister meronyms of Y, then if the relation is a strictly logical one, no meronym of X is simultaneously a meronym of Z. In other words, sister parts do not overlap.

But CONCEPTS are not clear-cut: the boundaries of parts often display a degree of vagueness which destroys the strict logical relationship.

Ex.: the extend of the upper arm and the lower arm. What about the elbow?
Disjunction: incompatibility opposites

• What is oppositeness? Main prerequisites:

✓ **Binarity:** there can only be two members of a set of opposites.

   *X is long* entails *X is not short*

✓ **Inherentness:** inherent binarity as opposed to accidental.

   It’s only accidental that there are exactly 2 open dining places at Brandeis campus during summer: Green Monster and Faculty club.
   By contrast, the possibilities of movement along a linear axis are logically limited to two: up and down.

✓ **Patency:** inherent binarity has to be a salient part of the meaning of opposites.

<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Yesterday</th>
<th>Today</th>
<th>Tomorrow</th>
</tr>
</thead>
</table>

The location of *Monday* and *Wednesday* in opposite directions along the time axis relative to *Tuesday* has to be inferred, whereas the directionality of *yesterday* and *tomorrow* relative to *today* is a salient part of their meaning.
Opposites 1: complementaries

- Some definite conceptual area is partitioned by the terms of the opposition into two mutually exclusive compartments, with no possibility of ‘sitting on the fence’: if anything within the appropriate area falls into one of the compartments, it cannot fall into the other.

Ex.: dead: alive, true: false, obey: disobey, inside: outside, possible: impossible, male: female, etc.

Complementaries in terms of entailment:

F(X) entails and is entailed by not-F(Y)
Male entails and is entailed by not-female
True entails and is entailed by not-false

Cases contradicting the strict definition.

Dichotomy dead: alive: what about the undead (zombies, vampires, etc.)?
Opposites 2: antonyms 1

Main characteristics:

(i) Both terms are fully gradable:
   very/slightly/rather/quite/too long vs. ?very/slightly/rather/quite/too dead

(ii) They occur normally in the comparative and superlative degree
    long-longer-longest; light-lighter-lightest
    Even when used in the positive degree, they typically need to be interpreted comparatively in relation to some reference value. A long poem is taken to be a poem that is longer than the average poem. (Small elephant vs. big mosquito)

(iii) They indicate degrees of some objective, unidimensional physical property, one which can be measured in conventional units (centimetres, kilograms, miles per hour).

(iv) They are incompatibles, but not complementaries
    It’s neither long nor short is not a contradiction

(v) Comparative forms stand in a converse relationship
    A is heavier than B entails and is entailed by B is lighter than A
(vi) The comparative forms of both terms are impartial: use in the comparative does not presuppose that the term in the positive degree is applicable.

$X$ is longer than $Y$ does not presuppose that $X$ is long.

(vii) One of the terms yields an impartial question in the frame

*How $X$ is it?* and an impartial nominalization.

*How long is it?* Merely enquires about the length without any presupposition vs. *How short is it?* The presupposition is that it is short.

It is the term that indicates more of the relevant property that yields the impartial question

*How long/strong/big/thick/wide is it?*
Opposites 3: reversives

- Reversives are directional opposites which include
  - straightforward directions such as up:down, forwards:backwards, into:out of, north:south,
  - extremes along some axis: top:bottom
- Reversives have the peculiarity of denoting movement (or change in general) in opposite directions, between two terminal states.
- They are all verbs: rise:fall, advance:retreat, enter:leave

More abstract examples of reversity (change between two states): tie:untie, dress:undress, roll:unroll, mount:dismount

The manner of the process and details of the path do not count, it is the effective direction from origin to goal which matters.

Compare tie and untie: both are different actions, but the states in the beginning and the ends of both are the same.
Opposites 4: converses 1

- Convereses are directional opposites also.
  Ex.: above:below

A
B
C

A and C in relation to B: A is above B and C is below B, hence *above* and *below* denote orientations in opposite directions and are directional opposites therefore.

The relation between A and B can be expressed in two ways:

*A is above B or B is below A*, both are logically equivalent, express a different perspective on the same situation.

Other examples: *precede:follow, in front of:behind, lend:borrow, buy:sell*, etc.
Opposites 4: converses 2

- Converses may be a part of a two-place predicate \((above:below)\)
  a three-place predicate:
  
  \[ A \text{ borrowed } B \text{ from } C / C \text{ lent } B \text{ to } A \]

or a four-place predicate:

\[ \text{John sold the car to Bill for } €5.000 / \text{Bill bought the car from John for } €5.000 \]
Bibliography