

# 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*  
n. *fisher* vs. v. *fish*  
v. *fish* vs. *fished* } the same **lexical root**

**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:

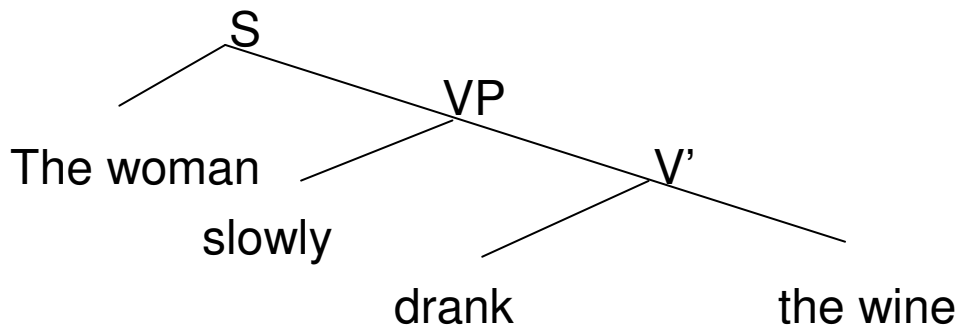
The woman drank the wine slowly

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 1

- 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 ( $\geq 1$ )
  - 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*

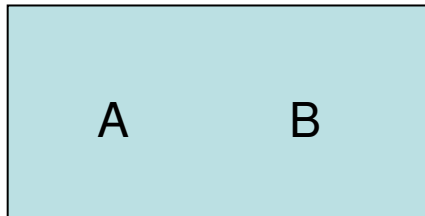
-**derivational**: word families (*fish, fisher, fishy*) **MORPHOLOGY**

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

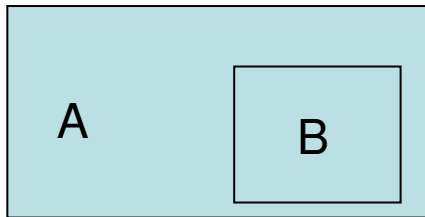
<i>I'll have a glass of</i>	-----	<i>John</i>	-----	<i>across the field</i>
	<i>beer</i>		<i>ran</i>	
	<i>wine</i>		<i>walked</i>	
	<i>water</i>		<i>crawled</i>	
	<i>lemonade</i>			

# Types of paradigmatic lexical relations in terms of set-theoretical relations

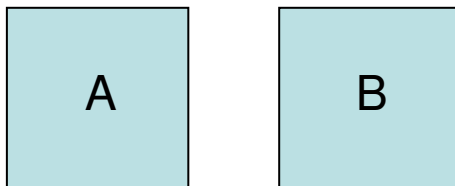
- I. Identity: class A and class B have the same members



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

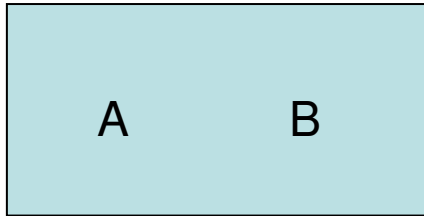


- III. Disjunction: class A and class B have no members in common



# Identity: synonymy

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



- 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* court of law

*This was the first time they had had made love* neutral in everyday speech

*Thus was the first time they had fucked* colloquial

(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:

<i>entity</i>	<i>process</i>
<i>living thing</i>	<i>object</i>
<i>animal</i>	<i>plant</i>
<i>animal</i>	<i>bird</i>
<i>dog</i>	<i>cat</i>
<i>spaniel</i>	<i>poodle</i>

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

## Near-synonymy 2

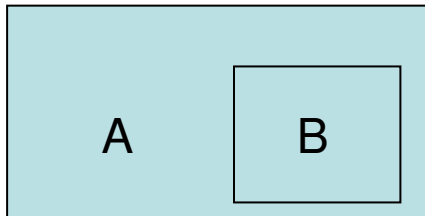
- Meaning differences that apparently do not destroy synonymy
  - ✓ Adjacent position on scale of ‘degree’: *fog:mist, laugh:chuckle, hot:scorching, big:huge, disaster:catastrophe, pull:heave, weep:sob*;
  - ✓ Certain adverbial specialization of verbs: *amble:stroll, chuckle:giggle, drink:quaff*;
  - ✓ 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.

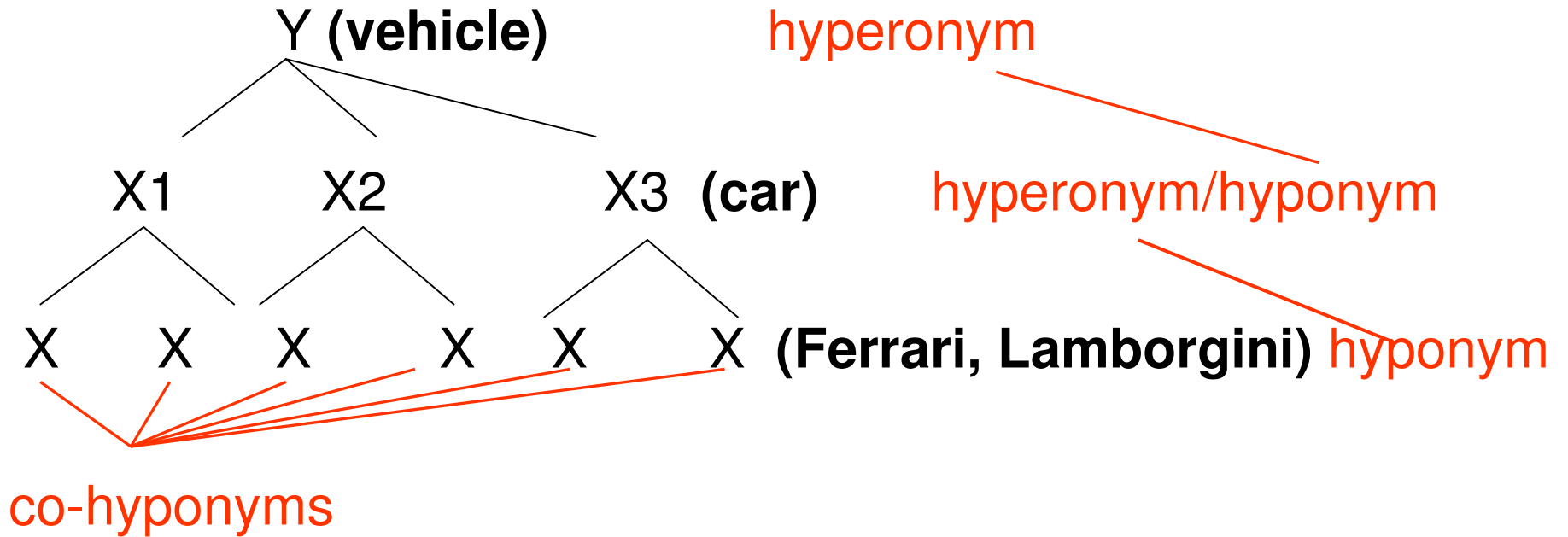
Ex.: *apple* is a *fruit*; *car* is a *vehicle*

- 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



# 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 of  $X$ .

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 than 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.

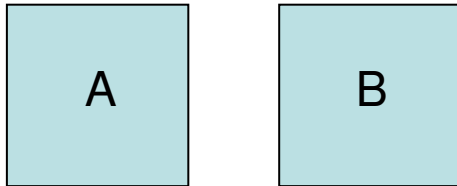
The handle of a door is for grasping and opening and shutting the door; the wheels of the car enable it to move smoothly over the ground, etc.

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 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.

# Disjunction: incompatibility co-hyponymy 3

- *This novel is a paperback.*

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

hyperonym: book (TOME)

hyponym: paperback, hardback

hyperonym: book (TEXT)

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.



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*

## Opposites 2: antonyms 2

- (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 reversivity (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

- Converses 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 borrowed B from C / C lent B to A*

or a four-place predicate:

John sold the car to Bill for €5.000 / Bill bought the car from John for €5.000

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