1. **Lexical semantics**

   \[\text{‘semantics’ = study of meaning}\]
   \[\text{‘lexical’ = of words}\]

   ‘Study of the meaning of words’?

Starting simply, words are thought to have several kinds of properties:

(1) a. Phonological, e.g. [kæt]
   b. Morphosyntactic, e.g. [+N], [+count]
   c. Semantic, i.e. ‘meaning’, e.g. something like this
      (from Merriam-Webster online):

      1 a : a carnivorous mammal (Felis catus) long domesticated as a pet and
         for catching rats and mice b : any of a family (Felidae) of
         carnivorous usually solitary and nocturnal mammals (as the
         domestic cat, lion, tiger, leopard, jaguar, cougar, wildcat, lynx, and
         cheetah)
      2 : a malicious woman
      3 : a strong tackle used to hoist an anchor to the cathead of a ship

   \[\text{This much info would lead you to think that you knew what ‘Lexical phonology’ was:}\]
   \[\text{the study of the phonology of words, and you’d be broadly right. (You’d soon find out}\]
   \[\text{that ‘word’ is a particular kind of phonological unit in this context, but you wouldn’t be}\]
   \[\text{shocked to find that out.).}\]

   \[\text{You’d probably start doing lexical phonology by making generalizations about the}\]
   \[\text{phonological characteristics of a lot of words, seeing what classes they fell into, whether}\]
   \[\text{those classes correlated with other characteristics of the words, etc.}\]

   \[\text{So it would make sense to think that ‘Lexical semantics’ is the study of the semantics}\]
   \[\text{of words (perhaps where ‘word’ is a particular kind of semantic unit; this is more or less}\]
   \[\text{right).}\]

   \[\text{By analogy, we could start doing lexical semantics by making generalizations about}\]
   \[\text{the semantic characteristics of a lot of words, seeing what classes they fall into, whether}\]
   \[\text{those classes correlate with other characteristics of the words, etc.}\]

(2) **Lexical phonology research:**

   — For example: could pick out all words whose phonological representations had
      syllable-initial consonant clusters in them
— could then look at the clusters and identify generalizations about them
— could then make statements about consonant clusters in English words

(3) What if we did the same thing for lexical semantics?
— pick out all words whose semantic representations (definitions) had something in common, like e.g., they mentioned the word ‘cat’
— could then look at the semantic representations and identify generalizations about them?
— and make statements about semantic representations containing ‘cat’ in English words?

→ Is ‘mentioning the word ‘cat’ a sensible natural class— a suitable object of scientific study?

→ Problem: how do we tell our knowledge about the meaning of words apart from our knowledge about the world?

→ E.g. How do we know that the predicate ‘long domesticated as a pet’, from def. 1a above, is a property of the word ‘cat’, rather than a property of cats?

(4) Other examples:
a. how do we know that the predicate ‘not married’ is something we know about the word ‘bachelor’, rather than something we know about bachelors?
b. how do we know that the predicate ‘makes a noise that sounds like [mijaw]’ is something we know about cats rather than something we know about the word ‘cat’?
c. how do we know that the predicate ‘is used for sitting on’ is something we know about the word ‘chair’ rather than something we know about chairs?
d. how do we know that ‘contains alcohol’ is something we know about beer rather than something we know about the word ‘beer’
e. how do we know that the predicate ‘gently ingest liquid’ is something we know about the word ‘sip’, rather than something we know about sipping?

→ The definitional hypothesis says that the way the meaning of a word is represented is with other words, or, more precisely, with the meanings of other words. Word meanings are made up of other word meanings.

→ This is circular unless there is some set of meanings that we just automatically know — some atomic meanings, which might be referred to by some very basic-level words — in terms of which the meanings of all other words can be exhaustively stated.

→ The search for atomic meanings and exhaustive definitions is the story of analytic philosophy. A linguist who has actually made it a research project for her whole career is Anna Wierzbicka, who’s worth reading. We may read some of her stuff this semester officially, but if we don’t get to it I recommend it unofficially.
2 Tools for doing semantics:

→ Seems like there’s an intuition that some aspects of definitions are more important than others — i.e. that some relations (perhaps like ‘(is a) carnivorous mammal’) are more important than others (perhaps like ‘long domesticated as a pet’). Something can be a cat if it’s not domesticated, but can it be a cat if it’s not a carnivorous mammal?

→ What’s the basis for this intuition?

2. Entailment, etc.

Formal semantics is the study of the composition of complex concepts, like the propositions denoted by "John loves Mary" or "Newton and the great array of astronomers who have succeeded him have proved that, within planetary distances, matter attracts with a force varying inversely as the square of the distance," or "There was a young lady from Worcester, who used to crow like a rooster."

Formal semanticists have a head start: it’s clear that the concepts they study are made up of pieces, identifiable on both phonological and semantic grounds. All they have to do is specify the ways the pieces fit together and way you compute the result of fitting two pieces together, and their job is done.

It's clear, to take the easy case, that if you are equipped to understand the meaning of the string 1a, you also are equipped to understand the meaning of the string 1b.

(5) a. Cats love dogs.
   b. Dogs love cats.

This is because of compositionality, since the difference between the meanings of a. and b. lie entirely in the positions the elements "cats" and "dogs" occupy in the structure, if you can compute the meaning of (a) using the meanings of ‘cats’, ‘dogs’ and ‘loves’, you can compute the meaning of (b) using those same meanings, just in a different combination.

This has enabled formal semanticists to explain a lot of things. They can explain

(6) Logical Entailment
   a. Mary and Sue love John.
      \(\therefore\) Sue loves John.
   b. The chair by the door
      The thing which is a chair and is also by the door
   c. Bossy is a brown cow.
      \(\therefore\) Bossy is brown and Bossy is a cow.
   d. Someone loves everyone
      Everyone didn't eat their dinner.
   e. Socrates is a man.
      All men are mortal.
      \(\therefore\) Socrates is mortal.
They can explain why, in a given context, the two NPs in (6)b designate the same real-world object. They can explain why if Bossy is a brown cow, Bossy must be brown and Bossy must be a cow. They can explain (usually) why sentences like (6)d have two different meanings. And they are extremely proud of how they can explain that, given the truth of the first two sentences of (6)e, the truth of the third then follows.

Some of these explanations depend on specifying meanings for particular lexical items — that is, *some* lexical semantics is involved. The meaning of ‘and’ is crucial for (a); the meaning of *is*, *which*, *and* and *also* are crucial for (b); the meaning of *some* and *every* are crucial for (d), and the meaning of *is* and *all* are crucial for (e). In (c), the meaning of *is* is important, but also important is a rule of Predicate Composition, which tells you what to do when you put the meaning of ‘Brown’ and ‘Cow’ together. In all cases, the meanings of the ‘content’ words — non-functional words — is irrelevant.

This is called "entailment", and simply means that the truth of some proposition P ensures the truth of some proposition Q, purely on formal grounds. That is, it doesn't matter what the individual content of the lexical items "brown" and "cow" are in (6), e.g., provided they each pick out some set of entities, the predicate "brown cow" refers to the intersection of those two sets and the sentence situates the individual Bossy within that intersection. Hence their disinterest in the specific characteristics of the meanings of lexical items; as long as they pick out sets, they do their job, and compositionality will do the rest.

So: sentence meanings are made up of combinations of more 'basic' concepts — word meanings, plus rules for putting word meanings together.

Are word meanings made up of combinations of 'basic' concepts? Phonological word meanings can be — the meaning of *walked* is the meaning of *walk* + the meaning of -*ed*. But what about the meanings of monomorphemic, contentful lexemes?

(7) Intra-lexical entailment?

a. Mary broke the glass.
   ∴ The glass broke.
   ∴ Mary caused the glass to break.

b. John is a bachelor.
   ∴ John is unmarried
   ∴ John is male
   ∴ John is an unmarried male

c. I painted the wall.
   ∴ I caused the wall to become covered with paint.

d. Toot is a cat.
   ∴ Toot is an animal
   ∴ Toot is a mammal
   ∴ Toot is furry.
   ∴ Toot is a carnivore.
   ∴ Toot may be a pet.
   ∴ Toot's tail twitches involuntarily when she's stalking something…

If all of the above are entailment relations with the same status as the one about Socrates' mortality, then there's more to say about the "meaning" of, say, "cat" or "paint"
than that the concept CAT picks out the set of cats, or that the concept PAINT picks out the set of pairs \(<x,y>\) such that \(x\) painted \(y\), etc.

However, there's another possibility. The entailment relations above might not have the status of the one about Socrates' mortality. Rather, they might simply be pieces of world knowledge about the concepts the words refer to. If that's so, then these are not arguments that words are made up of compositional elements that enter into true entailment relations. These, then, are perhaps more on a par with "bachelors are unlikely to have children" or something similar, which really seems like knowledge about bachelors, not the word 'bachelor'.

Of course, the study of such world knowledge and how we come by it, and how it's organized, etc., is an interesting and important subject, but it's likely that it falls more into the domain of psychology than linguistics.

Linguistics will be concerned with how a given string gets hooked up with a given batch of conceptual knowledge, perhaps, but not be concerned with the structure of the world knowledge per se.

What we're worried about in this course is whether there are elements of lexical meaning that seem to constrain linguistic possibilities. Maybe in our example with 'cat' above, we just picked the wrong predicate — the natural class of words associated with cats doesn’t help us understand anything about language. But what if there was some predicate, e.g. ‘Agent’ or ‘Change’, that if we picked out all the (suitably-formulated) definitions that mentioned or entailed that word, would correlate with natural classes in some other linguistic domain.

But are we even allowed to do that? What if any kind of decomposition leads us astray?

When reading Fodor:
RTM = ‘Representational Theory of Mind’

3. **What’s a word?**

But what is a word? There are two ways of thinking about it:

**Idea I:** **A word is a phonological unit**

Phonologists tend to represent words as elements which can be pronounced on their own, and can appear independently of other items in an utterance. We represent that intuition in writing by inserting spaces between the strings that are intended to represent single words. So *walks* and *walked* are phonological words, but *pass the buck* or *eat crow* are not.

1. **Speakers' intuitions divide speech up into words based on:**
   a) **phonotactic** constraints
   b) word-sized phonological processes: e.g. stress assignment, vowel harmony.
   c) distribution: words are distributionally free — they occur by themselves, at the beginnings and ends of utterances, and next to lots of other different items.
2. **Phonotactic constraints defining possible phonological words**

a) *…NC#
   where C is [ -cont, -coronal, + voiced]

b) impossible words: */bɔmb/ */sĩŋ?/ */?pɑŋp?/
   but ok: /sĩŋk?/ /bɑmp?/ /?sɛnt/ 

c) the lame boy  the wing gunner  the pumpkin patch

3. **Word-sized phonological processes:**

a) English stress assignment:
   the black bird   vs.  the blackbird
   the white house  vs.  the White House

b) Chuckchee vowel harmony
   "when any part of a complex word has a 'dominant' vowel in it (e, o, a), any 'recessive'
   vowels (i, u, e) in the word change into the corresponding dominant ones (i → e, u → o,
   e→a)."  (Muravyova, 1998)

   *Harmony within words:*
   ga- …-ma + riquke → ga-regoka-ma
   "with" + polar fox  "with a polar fox"

   *No harmony between words*
   galga-t  riŋe-te  n-ekwet-qine-
   "The birds are flying away"

   (galga-t 'birds' has dominant vowels, riŋe-te 'flying' has recessive vowels)

4. **Words at beginning and ends of utterances, in isolation:**

Is flying a word? Yes!
   Flying planes can be dangerous.
   I like flying planes.
   I dreamt that I was flying.
   A: What's that bird doing?
   B: Flying!

Is ness a word? No!
   …entitled to life, liberty and the pursuit of happiness.
   *Ness is what I feel happ- when I pick up a warm puppy.
   (compare: Happiness is what I feel when I pick up a warm puppy)
   A: What do you like about being happy?
B: *Ness itself! (Happiness itself!)

**Idea 2:** A word is an arbitrary sound-meaning pairing

Dictionaries tend to represent words as sound-meaning pairs whose meanings are not a function of the meanings of their parts. So, for example, there's a separate entry for *walk*, but not for *walked* or *walks*. Similarly, there's usually a separate entry for things like *pass the buck* or *eat crow*.

5. **What kinds of things are in dictionaries?**
   - *re-* - *ness* - *er* - *ed* - *ly* - *un-* - *er*
   - *cat* *n.* (pl. *-s*). A feline quadruped…
   - *under the weather*: (expression) not feeling well, somewhat ill.

6. **Saussure: the arbitrariness of the sign**

<table>
<thead>
<tr>
<th>English</th>
<th>dog</th>
<th>German</th>
<th>hond</th>
</tr>
</thead>
<tbody>
<tr>
<td>French</td>
<td>chien</td>
<td>Old Irish</td>
<td>cú</td>
</tr>
<tr>
<td>Spanish</td>
<td>perro</td>
<td>Ulwa</td>
<td>sulu</td>
</tr>
<tr>
<td>Japanese</td>
<td>ito</td>
<td>Hiaki</td>
<td>chuu'u</td>
</tr>
</tbody>
</table>

7. **Compositionality of language:**

   *The black bird*
   
   *I came to Victoria*
   
   *This is the farmer, sowing the corn, that kept the cock that crowed in the morn that waked the priest all shaven and shorn that married the man all tattered and torn that kissed the maiden all forlorn that milked the cow with the crumpled horn that tossed the dog that worried the cat that chased the rat that ate the malt that lay in the house that Jack built.*

Dictionaries don't list things that are *compositional*, whose meaning you can figure out from its parts.

8. **"Words and Rules" : the great insight of generative grammar**

| cat | feline quadruped…
|-----|-------------------|
| -ness | abstract nominalizer…
| -s | plural…
| -s 3rd person singular…
| go | to move away…
| the | definite determiner…
| outside | exterior of shelter…
| every | universal quantifier…
| three | 3…
| minute | short time span…

The cat goes outside every three minutes.
9. According to idea 2, a word is any linguistic unit whose meaning is arbitrary — whose meaning must be listed in the mental lexicon that is the input to the rule system:

Productive affixes: un-, -ness, -s, -ize
Monomorphemic words: party, cat, slouch, Seattle
Complex words with idiosyncratic meaning(s): transmission, winterize, recital
Idioms (syntactic complexes with idiosyncratic meanings): kick the bucket, pull the wool over X's eyes, take a leak, look up …

**Phonological words ≠ semantic words**

Some more examples

10. Chukchee: incorporation
a) tə-jaa-racwəŋ-melŋar-marawərkən.
   I-distant-compete-gun-fight.
   "I am fighting a duel"

b) tə-qora-pelarkən
   I-reindeer-leave
   "I'm leaving the reindeer"

c) ga-ŋəron-wetʔat arma quaat-ta
   with-three-butt-strong-reindeer-with
   "With three butting, strong reindeer"

11. **English: semantic vs. phonological mismatch**

All the stuff we've seen above, obviously, plus:

a) mismatched bracketings
Semantic bracketing:
   [transformational grammar]ian = someone who does transformational grammar
   (not a mighty morphin' grammarian)

Phonological bracketing:
   [transformational] [grammian]

b) phonological words that aren't semantic words:
   *kit and caboodle*
   *to and fro*

c) semantic words that aren't phonological words:
   -er, -ness, un-
d) morphemes that are neither semantic nor phonological words!
   
   *cran* in *cranberry*

   (and loganberry, huckleberry, strawberry, marionberry… )

   *ceive* in *deceive, receive, conceive, perceive…*

   Where this gets us into trouble is in the syntax. Syntacticians have wanted to use *both* definitions.

   Syntax (esp. as conceived of by structuralists) is the study of the distribution patterns of phonological words. The syntax is what takes phonological words and combines them into phrases. In fact, phonological words are identified by virtue of their freedom in the syntax, their lack of encumbrances.

   Syntax is *also* supposed to be the generative engine that allows us to represent complex ideas that have often never before been uttered by using a finite set of sound-meaning pairings, variously arranged. So the fact that *John loves Mary* is not synonymous with *Mary loves John*, *loves John Mary* or *John Mary loves*, and the fact that the latter two strings of words are not well-formed sentences of English, is a fact about syntax and the syntax/semantics interface.

   It's the structure-meaning connection that lets us explain why a single string can have two perfectly compositional interpretations:

   *Mary hit the man with the stick*

   — if Mary used the stick to hit the man, the bracketing is
     
     [Mary] [ [hit] [the man] ] [with the stick] ]

   — if Mary used her hand to hit the man, the bracketing is
     
     [Mary] [ [hit] [the man [with the stick] ]

   So, then: what are we to make of the fact that phonological words are *not the same items* as semantic words? What does that mean for lexical semantics?

   There's no question that lexical semanticists are interested in the study of semantic words, which we'll call *lexemes* for the duration of the course. This is the study of concepts, which is important for philosophy, psychology and linguistics.

   A lot of linguistically-oriented lexical semanticists, though, are concerned with understanding regularities in meaning variation in lexemes, like the relationship between intransitive and transitive *break*. In English, these two *breaks* are not related by any obvious compositional derivation, and yet, they appear to share many features of meaning (e.g. whatever it is that *breaking* is); indeed, transitive *break* appears to entail intransitive *break* in the same way that "I like Bill and Mary" entails "I like Mary".