

Chapter 6

Lexical semantics

The structure of meaning,
the meaning of structure

/ðə 'stɪlktʃəɪ əv 'mɪjnɪŋ

ðə 'mɪjnɪŋ əv stɪlktʃəɪ/

In this chapter we take a first look at the kinds of meanings that listemes have. We look first at function listemes—those whose meaning is an intrinsic part of the grammar of English—and then at content listemes, whose meanings flow and change over time. Even though the meanings of content listemes are somewhat more amorphous than those of function listemes, we learn that there are certain generalizations and classifications of content listemes that we can make, generalizations about valence, argument structure and event structure. Finally, we look at the ways the different classes of content listemes interact with function listemes.

In the previous two chapters, we've seen a lot about certain kinds of restrictions that morphemes impose on their immediate neighbors—phonological restrictions (like comparative *-er* has), and morphological restrictions (like causative *-ify* has). But there are other kinds of restrictions that listemes are subject to, even when all their phonological and morphological requirements are happily met. Consider the following groups of examples:

- (90) a. Defenseless fuzzy bunnies run quickly.

a'. #Colorless green ideas sleep furiously.⁷⁸

b. I asked whether she likes him. / *I asked that she likes him.

b'. I know whether she likes him. / I know that she likes him.

b''. *I hope whether she likes him. / I hope that she likes him.

c. He emptied the tub.

c`. The tub emptied.

c``. He cleaned the tub.

c```. *The tub cleaned.

d. The crash killed the driver.

d'. #The crash murdered the driver.

Some of these sentences are fine examples of English, and some of them aren't. Whatever the problem is with the not-fine ones, though, it's clear that it isn't phonological or morphological. In this chapter, we begin to look at the lexical knowledge you have that tells you which of the above sentences are good and which are bad: we begin to look at *meaning*.

We'll consider questions like the following: In compositional words, how do the meanings of the parts combine to make the meaning of the whole? Are there any restrictions on what the parts themselves can mean? How are the meanings of listemes organized in the mind? And how do people learn the meanings of listemes?

6.1 *Function meaning vs. Content meaning*

We've observed before that there are two main categories of listemes: function and content. Content listemes carry the meanings that are summarized in dictionary entries; they carry the 'meat' of the message we want to send. Function morphemes restrict and organize those meanings, providing the structure that lets us communicate better than Tarzan or Koko. Although one can be explicitly instructed about the

⁷⁸ The * marker in front of an example indicates morphological or syntactic ungrammaticality. Here we also use the # marker, which indicates syntactic well-formedness but *semantic* markedness — syntactically it's ok, but its meaning is confused.

proper meanings and uses of content listemes (that's what dictionaries are for), almost no one is ever explicitly instructed in the meaning and use of a function listeme. It's usually either too hard or too easy to explain.

Exercise 1: Sort the following function listemes into two groups: 'hard to define' and 'easy to define'. Provide a definition for the easy ones.
a, but, every, had, his, I, if, me, and, -s (as in (two) dogs), that (as in He said that I lied), them, what

For many function listemes, the only definition that can possibly be helpful is a description of how it is used in a sentence. Below, I give the first definition in the long list of 'definitions' that the OED provides for the word *that*, which occurs in phrases like *He said that I lied*⁷⁹:

that: Introducing a dependent substantive-clause, as subject, object, or other element of the principal clause, or as complement of a n. or adj., or in apposition with a n. therein.

Now, very few people in the English-speaking world know enough grammatical terminology to be able to understand this definition, (which, despite being very complicated, is in fact quite inadequate to accurately capture the use of *that*, as we can see from the ten or so other definitions the OED provides and the extra entry for *that* in a relative clause). Yet, every English-speaking 5-year old has mastery of this word. At the other extreme, the function listeme *-s*, as in *two dogs*, doesn't even rate a definition in the OED (although *-ed* and *-ing* do). The Cambridge Advanced Learner's Dictionary gives the following definition:

⁷⁹ This 'that' is different from the determiner 'that', as in *that girl*, though they are written the same way. For one thing, they are pronounced differently: unless emphasized, the *that* in *He said that I knew him* is pronounced /ðət/, while the *that* in *I know that girl* is invariably pronounced /ðæt/, with a full vowel.

-s: used to form the plural of nouns: *books, sandwiches*

Even quite a young English speaker, who didn't know what 'plural' meant, or what a noun is, could do a good approximation of this definition—they'd probably say that it meant 'more than one of something', which is pretty much a paraphrase of the official definition above.⁸⁰

With content listemes, there's much more of a continuum of difficulty in writing definitions. Some seem hard to define, others easy, others in-between. Compare, for instance, the subtleties involved in appropriately deploying a word like *matron* or *dame* with the general-purpose word *woman*, or the somewhat more restricted *lady*. How about *pooch* or *hound* compared to *dog*?

Despite the gradience of content meanings, there are deep connections between the concept named by a content listeme and the kinds of structures (and function listemes) that the content listeme can occur with. For instance, verbs like *say* or *belief* can be followed by a clause introduced by *that*, but verbs like *fall* or *touch* really cannot:

- (91) a. Ancient scholars didn't say [that the world was flat].
 b. Ancient scholars didn't really hold the belief [that the world was flat].
 c. *Ancient scholars didn't fall [that the world was flat].
 d. *Ancient scholars didn't really hold the touch [that the world was flat].

⁸⁰ A very subtle semantic property of plural *-s* is missed by both of these definitions. In *She groomed dogs*, we're talking about more than one dog, but not nearly all dogs—*some* dogs. In *She liked dogs*, we're also talking about more than one dog—but not just *some* dogs: *most* dogs, or dogs in general. In combination with one kind of predicate—one that denotes a temporary property or event, like *groom* — *-s* means 'some', but in combination with another—one that denotes a more permanent property or quality, like *like* — *-s* means 'most' or 'practically all'.

More subtly, as we saw above, while a word like *hope* can be followed by a clause introduced by *that*, it can't be followed by one introduced by *whether*—and words like *ask* work in exactly the opposite way:

- (92) a. I hoped *that*/**whether* she liked it.
 b. I asked **that*/*whether* she liked it.

Exercise 2: What do you think is the difference between *that* and *whether* in example (92) above?

It must be that the meanings of these content words put restrictions on the kinds of function words that can go with them. In this chapter, we'll first look briefly at the meanings (a.k.a functions) of function listemes, so that we have some more sophisticated understanding of structure to go on with. Then we'll look at the meanings of content words and the kinds of relationships that they have to each other. Finally, we'll consider the interactions between function and content words, and how their meanings can affect one another.

6.2 *Some function words and their meanings*

Some of the best-understood meanings are those of function listemes. A few of these listemes have had their meanings investigated since the dawn of philosophy and before, as part of the study of logic.

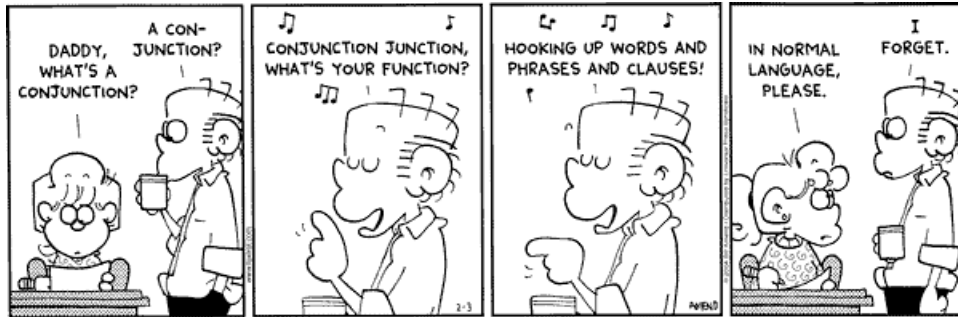
logic, *n.* From Greek, *log-* 'word, reason' + *ike*, 'art of' or 'theory of' The branch of philosophy that treats of the forms of thinking in general, and more especially of inference and of scientific method.

Before we proceed to our first function words, however, we need some tools for investigating meaning. One of the most powerful ones that we have is the logical idea of *entailment*, which is closely connected to the notion of truth. If we assume that a given statement is true, its entailments are the other statements that 'logically' follow—that *must* be

true⁸¹—given the meaning of the first statement. Since statement meaning is made up of listeme meanings, we can often get a handle on listeme meanings by looking at the entailments of statements that contain the listeme we’re wondering about.

To illustrate the idea of an entailment, think about what else would necessarily have to be true if the statement *Flossie is a brown cow* is true. One of the entailments of that statement is *Flossie is a cow*. What other ones can you think of? (Remember that entailments are *necessary* truths, not simply quite probable ones. *Flossie has horns* may be probable if *Flossie is a brown cow* is true, but it’s not necessarily true, so it’s not an entailment of *Flossie is a brown cow*.)

6.2.1 Conjunctions



Conjunctions are words that stick two elements of the same type together (they *conjoin* them). For instance, *and* and *or* conjoin two sentences in the examples below:

- (93) a. [She studied] and [she failed].
 b. [She studied] or [she failed].

⁸¹ What does ‘true’ mean, you may ask? Let’s (at least initially) assume ‘describes the actual state of the world’ (so far as it can be accurately determined, barring existential doubts, etc.)

In the first case, with *and*, the meaning of the whole conjoined sentence is true if both of the conjuncts are true. In the second, with *or*, the whole sentence is true if at least one of the conjunct sentences are true. (If the person *she* refers to in the above sentences didn't study, and failed, then sentence (93)a is false but (93)b is true; similarly if she did study, and didn't fail.)

The meanings of *and* and *or* specify what the conditions are that make a sentence with them in it a true sentence. That's one central way of thinking about word meaning: a word's 'meaning' consists of a specification of the conditions in which it can be used truthfully. If you know that the word *and* can be used to make a true sentence out of two other sentences as long as both of the other sentences are true, then you know just about everything there is to know about the meaning of *and*. As we go along we'll see that words specify more than just truth conditions, but the notion that word meanings determine truth conditions will remain central.

To see how word meanings can specify more than just truth-conditions, though, consider the two conjunctions *but* and *although* below:

- (94) a. She studied, but she failed.
 b. She studied, although she failed.

In order for these sentences to be true, both conjuncts have to be true (you couldn't say (94)a or b truthfully if she hadn't studied, or if she hadn't failed)—but these conjunctions carry a certain amount of extra information as well. This extra information tells something about the attitude of the speaker towards the conjuncts. *But* implies that the speaker thinks the truth of the second statement is unexpected, given the truth of the first. *Although* implies that the speaker thinks the truth of the first statement is unexpected, given the truth of the second. In a sentence of the form *A but B*, B is unexpected; in a sentence of the form *A, although B*, A is unexpected.

All conjunctions are able to conjoin two sentences, but only some of them can conjoin nouns, verbs, or adjectives (or the phrases built on them):

(95) *Noun Phrases*

- a. I saw [the girl] and [the boy].
- b. *I saw [the girl] although [the boy].

Verbs

- c. I [saw] and [liked] the new model.
- d. *I [saw] although [hated] the new model.

Adjectives

- e. I saw the [athletic] and [short] boy.
- f. ?I saw the [athletic] although [short] boy.

In (95), we see that *and* can conjoin elements of several different syntactic categories. *Although* is more restricted; it can't conjoin nouns or verbs, although it may be able to conjoin adjectives. (What is your own judgment about (6f)? I find it somewhat literary, but not ungrammatical.) The lexical entries for *and* and *although*, then, will look something like this: (In the syntax for *and*, the subscripted 'X' stands for any syntactic category—noun, noun phrase, verb, adjective, sentence, etc. In the syntax for *although*, 'S' stands for 'Sentence', and 'A' for 'Adjective'; the curly braces stand for 'choose one of', as usual.)

(96) *Phonology**Syntax**Semantics*

/ænd/ [[$_x$] and [$_x$]] Both conjuncts are true.⁸²

/əlðəʊ/[[$\{s, a\}$] although] [$\{s, \{s, _A\} A\}$]⁸³ Both conjuncts are true, and the first is unexpected, given the second.

Exercise 3: What kinds of syntactic categories can be conjoined by *but*? We've seen that *but* can conjoin sentences. What about noun phrases? Adjectives? Verbs? Construct examples showing what *but* can and can't do.

6.2.2 Determiners

Another set of function words whose meanings are fairly well understood are the *determiners*, sometimes called *articles* or *quantifiers*. These are the words that occur in front of nouns, or nouns that are modified by adjectives or other words (the whole group of noun plus modifying words is called a 'noun phrase').

Determiners can be fussy about the sorts of nouns they go with. There are two main classes of nouns in English: *mass* nouns and *count*

⁸² This is just a first pass at the right meaning of 'and'; of course, when the conjuncts are noun phrases like 'the girl' and 'the boy', it's not right to talk about them as being 'true' or 'false'. Rather, what is 'true' or 'false' is the whole sentence without the other conjunct in it. "I saw the boy and the girl" is true if both "I saw the boy" and "I saw the girl" are true. In general, to accurately characterize the meanings of function words, a difficult formal vocabulary is necessary; otherwise the *definiendum* is bound to show up in the *definiens* in one way or another.

⁸³ This syntax understates the possibilities for *although*, since the *although*-clause can also come before the other clause: *Although she failed, she studied*. This would have to be specified as an option in the syntax of *although*—and can't do it.

nouns. Mass nouns usually describe things that are amorphous—substances, like *water* or *metal*, although there are abstract ones too, like *happiness* and *spontaneity*. Count nouns usually describe things that can be individuated—counted—words like *cup* or *dog*, although again there are abstract ones, like *idea* or *compliment*. We'll come back to mass and count nouns in section 6.5 below.

Some examples of determiners with their nouns are given below:

(97) a. *Some determiners that require count nouns:*

a big fish	each cat	every small dog
several fries	three apples	many shirts
few doctors	which student	

b. *Determiners that require a mass noun*

much rain	little snow	(*much dog)
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c. *Determiners that require a mass noun or a **plural** count noun:*

<u>Mass nouns</u>	<u>Plural count nouns</u>	
some water	some grapes	(*some grape)
enough food	enough nails	(*some nail)

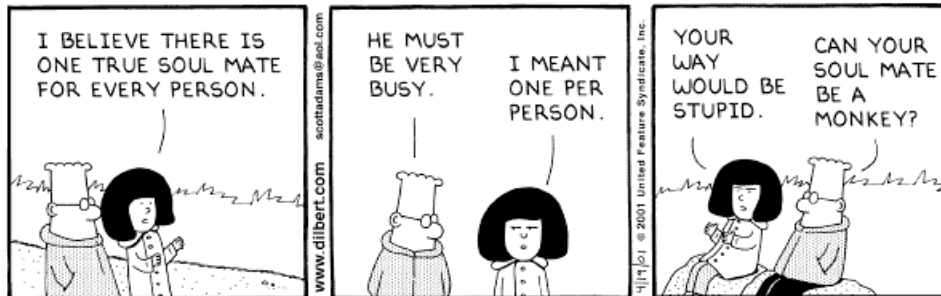
d. *Determiners that don't care whether the noun is count or mass:*

<u>Count nouns</u>	<u>Mass nouns</u>
the coat	the coffee
this computer	this rice
that mountain	that beef
my house	my sugar

The determiners in (97)a-c, tell you how much or how many of the noun are being referred to; they're usually called *quantifiers* (since they specify quantity). One of the most interesting properties of quantifiers is the way they interact with each other. Think about the truth conditions of the following sentence. That is, what kind of situations can this sentence truthfully describe?

(98) The president has a reason for everything he does.

This is true if the president has one reason that motivates all his actions, of course, but it's also true if, for each action, he has a different, unique reason.



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The last set of determiners, in (97)d—the determiners that don't care about quantity—carry another kind of meaning. They tell you the status of the noun with respect to the conversation. If the speaker expects the hearer to know exactly which instance of a particular noun she's talking about, she uses the definite determiner, *the*. If a noun under discussion is relatively close to the conversation, the speaker uses the demonstrative determiner, *this*. The possessive determiners, like *my*, specify who owns the noun, and their meanings depend on the conversation in the same way those of the personal pronouns do, which we'll look at in a minute. Meanings that vary depending on the conversational context this way are called *deictic* meanings.

deictic, /'dajktɪk/ *adj.* From Greek. Directly pointing out, demonstrative. (In logic, applied, after Aristotle, to reasoning which proves directly, as opposed to the *elenctic*, which proves indirectly.)

A lexicon entry for the determiners *every* and *the* might go something like this:

(99) <i>Phonology</i>	<i>Syntax</i>	<i>Semantics</i>
/ˈev.ɪ/	[every[___] _{NP}] _{NP}	All instances of “NP”
/ˈðə/	[the [___ _{NP}] _{NP}]	The unique instance of “NP” that is most relevant to the discourse

An enormous amount of work has been done on the semantics of determiners; for us, though, the main thing is to recognize the existence of the two main types: quantifying and deictic, and to recognize that the quantifying ones care about whether the noun they attach to is a mass noun or a count noun.

6.2.3 Pronouns

Pronouns stand in for a noun or a noun phrase. Their meanings are *entirely* deictic. What a pronoun refers to varies depending on the identity of the person speaking, and the conversation that they’re used in.

The first and second person pronouns *I* and *you*, and their plural counterparts, *we* and *you*, have meanings that depend on who in the conversation is talking. The speaker, no matter who it is, uses *I* and *we* to refer to himself and his associates, and *you* to refer to the person or people he’s talking to.

The third person pronouns are a bit trickier. They specify more than singular or plural; they also include information about the gender of the noun that they’re standing in for (*he*, masculine, *she*, feminine, and *it*, inanimate). They usually refer back to the topic of the conversation — the thing under discussion — although if the speaker and hearer disagree about what the topic of the conversation is, there’s lots of room for misconstrual:



Pronouns also specify one other thing—their form is sensitive to the structure of the sentence that they occur in. If the speaker wants to refer to herself in the following two sentences, she has to use a different pronoun in each case. Fill in the blanks as if you were saying the sentences. What pronoun do you use?

- (100) a. "Jake saw ____."
 b. "____ saw Jake."

If you are a native speaker of English, you put *me* in the first slot, and *I* in the second slot. English pronouns specify whether or not the noun phrase that they're standing in for is the subject of the sentence. Pronouns like *he*, *I*, *she*, *they*... etc., are subject pronouns. Pronouns like *me*, *him*, *them*, *us*, etc., show up everywhere else. 'Being the subject' is a grammatical property, so we'll include it as part of the syntactic information attached to the listeme.

Since they stand in for a noun phrase, like *the cat* or *Ratbert's head*, pronouns are themselves noun phrases, as far as their grammatical category goes. Lexical entries for *we*, *them* and *it* might look like this:

(101) Phonology	Syntax	Semantics
/wɪj/	[we] _{NPSubj}	The speaker and others.
/ðɛm/	[them] _{NPNonSubj}	The plural topic of conversation.
/ɪt/	[it] _{NP}	The non-human topic of conversation.

6.2.4 Complementizers

Words that introduce a complement clause are called *complementizers*. Some examples are below:

- (102) a. I believe that [she studied]_S.
 b. He wondered whether [she studied]_S.

complement,⁸⁴ *n.* From Latin *com-*, ‘intensive’ + *plēre* ‘full’⁸⁵ → *complere*, ‘to fill up, fulfill’, + *-ment*, ‘result or instrument of V’. That which completes or makes perfect. Grammatically, one or more words joined to another to complete the sense.

Another famous pair of complementizers are the conditional *if*, as in *I’ll go if you go*, and *because*, as in *I went because you went*.⁸⁶

Complementizers have the interesting semantic property of indicating the truth-conditional status of the complement clause that they introduce. Recall, above, that we asserted that statements have a truth value: they’re either true, if they correctly describe the real world, or false, if they don’t. But what is the truth value of a question, as in *Did she study?*

⁸⁴ Note the distinct spelling of the homophonous word *compliment*, which is derived from the same source as this word but has come to have quite a distinct meaning.

⁸⁵ The words *full* and *plere* are Indo-European cognates, the first Germanic, the second Romance, the fricative in the former related to the stop in the latter as expected by Grimm’s law—remember chapter 2?

⁸⁶ Sometimes it’s hard to decide the correct category of these things. If *although* is a conjunction, then perhaps *if* is one too, since they do behave in quite similar ways grammatically. Conversely, if *if* is a complementizer, then perhaps *although* is one too. Traditional grammarians often used the term *subordinating conjunction* for complementizers. Some analyses also count the question-words *who*, *which*, *why* *when* and *where* as complementizers when they’re used to form relative clauses, modifying a noun: *the man who left*, *the reason why he left*, *the place where he lived*. All of these alternate with *that* in these contexts. Oddly enough, *what* varies—some dialects of English allow it as a relative pronoun, as in *the chair what broke*—but no dialect of English, to my knowledge, allows *how* as a relative pronoun: *the way that/*how he did it*.

It's neither true nor false, of course; rather, it's a request by the speaker for someone else to inform him of the truth value of the statement. Some verbs that take a complement clause require that clause to be a question—verbs like *ask* or *wonder* are like this. The special complementizers *whether* and *if* explicitly indicate that the clause they introduce is a question — the truth value of the clause that they introduce is unknown, as in *I wonder if/whether she studied*. The complementizer *that*, on the other hand, indicates that the clause it introduces has a definite truth value, usually 'true'.

The bigger clause created by adding a complementizer to a sentence isn't a sentence by itself, of course; the complementizer forces that sentence to be a *complement* to something else (hence the name). We'll label this bigger clause, formed of a complementizer plus a sentence, *CP*, for 'Complementizer Phrase'. With that in mind, here's are lexical entries for *that* and *whether*:

(103)	<i>Phonology</i>	<i>Syntax</i>	<i>Semantics</i>
	/ðət/	[that [___] _S] _{CP}	S is true
	/'wɛðəɪ/	[whether [___] _S] _{CP}	The truth-value of S is unknown.

6.2.5 Tense and Aspect

Finally, in our inventory of functional items, we need to consider the meanings of the words and affixes that mark the temporal location and structure of the events described by a sentence. In English, this is most often accomplished by a *combination* of suffixes and auxiliary ('helper') verbs. These listemes, made up of a suffix plus an independent phonological word, necessitate some pretty odd-looking lexical entries!

6.2.5.1 Tense

First, let's consider tense. This indicates whether the events described in the sentence are happening in the past, present, or future, with respect to the moment of conversation. We've looked at the past tense fairly extensively already. It's marked as a suffix on the verb,

morphologically realized as /d/ in most cases, but adjusted to /t/ or /ɪd/ to satisfy the phonotactic demands of English. What being in the past tense *means* is that the proposition encoded by the sentence was true some time prior to the moment the sentence was spoken, whenever that is. Because the particular interpretation of a tense listeme is relative to the time of the conversation, like the meaning of pronouns, tense is also an inherently deictic category.

The future tense is a little more complicated. It is not indicated by an affix, but by adding the auxiliary verb *will* to the verb phrase. (The verb phrase is the verb plus its dependents: the object, indirect object, and any modifying adverbial phrases). The lexical entry for *will* could be represented like this:

(104)	<i>Phonology</i>	<i>Syntax</i>	<i>Semantics</i>
	/wɪl/	[will [___ _{VP}] _{VP}]	The sentence containing VP will be true sometime after the moment of speech.

The present tense is more complicated still, not least because there seem to be two versions of it.

The form of the verb usually called ‘present tense’ requires no overt morpheme at all, except when the subject of the verb is third person singular—that is, when the subject is *he*, *she* or *it*, or a noun phrase that one of those pronouns could stand in for. In that case, the suffix is /z/ (spelled *-s*), as in *He runs* or *Sue writes*.⁸⁷

The tricky thing about ‘present tense’ is that with most verbs, it usually doesn’t seem to mean ‘present’ at all. A sentence like *Mary runs* doesn’t mean that Mary’s running right now, at the present moment—rather, it means that she usually runs, or she regularly runs. This

⁸⁷ Recall that this suffix is homophonous with the plural-marking suffix /z/, and undergoes the same phonologically conditioned allomorphy.

kind of interpretation is called the *habitual*, since it seems to indicate that an action is done habitually.⁸⁸

With some verbs, though, this tense does mean exactly ‘present tense’. If I say *Bill knows French*, it does mean that he knows French right now. If I say *John is afraid*, or *Mary seems to be asleep*, it means that John is afraid right now, or that Mary seems to be asleep right now—not that John is habitually afraid, or that Mary habitually seems to be asleep. So, we’ve got small problem in coming up with a good definition for the present tense morpheme—it seems to mean one thing with one set of verbs, and another with another set. We’ll investigate the reasons for that difference later. Right now, though, let’s just assume that *-s* means simply ‘present’, as it does in *Mary seems to be asleep*, and suggest the following lexical entry for it:

(105)	<i>Phonology</i> /z/	<i>Syntax</i> [[____] _v -s] _v ⁸⁹	<i>Semantics</i> The sentence containing V is true at the moment of speech
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The way to say that an event like MARY RUN is going on right now is to use a combination of Tense and Aspect: you use the present tense of the auxiliary verb *be* with the progressive aspect of the main verb—we say *Mary is running*.

6.2.5.2 Aspect

Verb aspect is a little trickier to get a handle on than verb tense (but not too tricky!) We’ve just seen that tense tells you whether the event

⁸⁸ One notable special circumstance in which the present tense can be used to really mean ‘present tense’ is in simultaneous narration, such as you get in sports broadcasting. The exclamation ‘He shoots! He scores!’, when used to describe an ongoing hockey game, really is describing events happening right now, not habitual events.

⁸⁹ This suffix, of course, indicates more than present tense— it also indicates that the subject of the sentence is 3rd person singular (present tense verbs with first or second person subjects, or plural subjects, don’t get any suffix). This would be part of the syntactic information attached to this listeme.

described by the verb phrase is in the past, present, or future, relative to the conversational moment. Aspect tells you whether the event described by the verb phrase is in the middle of happening, or if it's over, regardless of when the conversational moment is. Tense is deictic; aspect is not.

For instance, suppose you were talking about what was going on right at 2:00 yesterday. Right at 2:00, Mary was in the middle of her daily run, Bill put the last finishing touch on a table he was working on, and Jill was relaxing after putting the dishes in the dishwasher. Because the events all happened yesterday, you have to use the past tense, but you'll use different *aspects* to describe each event. Fill in the blanks in the following sentence with the right combination of auxiliaries and verb forms, using the verbs *run*, *finish* and *load*:

- (106) "At 2:00, Mary _____, Bill _____ his table, and Jill _____ the dishwasher.

What did you get? The forms I find most felicitous are *was running* (past tense with progressive aspect), *finished* (straight past tense), and *had loaded* (past tense with perfect aspect).

The progressive aspect, marked with the *be* auxiliary plus *-ing*, indicates that the event is ongoing—it's begun, but is not yet over. The perfect aspect, marked with the *have* auxiliary plus that perfective participle *-ed* that we've talked about, indicates that the event is all the way over.

Lexical entries for the progressive and perfect aspects are below. They look a little strange, because they're made up of both an independent auxiliary verb, and a bound suffix that attaches to the main verb, but the correct placement of both pieces is specified in the syntax of the form:

- | | | | |
|-------|-----------------------------|---|---------------------------|
| (107) | <i>Phonology</i> | <i>Syntax</i> | <i>Semantics</i> |
| | /bɪj/ ⁹⁰ .../ɪŋ/ | [be [[[<u>-v-</u> ɪŋ] _v (...)] _{VP}]] _{VP} | Event of VP is incomplete |

⁹⁰ Actually, since *be* is suppletive for tense, as we discussed in the last chapter, the actual form of *be* that will be used will depend on what the tense of the sentence is, and on what

/hæv/.../ən/ [have [[[____Vɪn] (...)]_{VP}]_P Event of VP
is complete

In section XX on the interaction of function words and content words, we'll see why *run* has to occur in the progressive aspect in order to occur in the present tense, and why *know* doesn't—and can't.

There is much more to say about the meaning and behavior of all of the functional items we've discussed above, and there are several that we haven't touched on at all (for instance, the meanings of modal auxiliary verbs, like *may*, *can*, *should* and *might*), but this is enough to go on with. Let's now turn to the kinds of meanings expressed by content words—the meanings, in short, of *roots*.

6.3 Content words and their meanings

Content words, as we've seen before, are the words which carry the meat of our messages. They are the nouns, verbs and adjectives that form the bulk of our vocabulary. What kinds of meanings do they have?

Traditional grammars of English claim that contentful syntactic categories convey certain kinds of basic meanings. Nouns are supposed to refer to a 'person, place or thing'; verbs are 'activities' and adjectives are 'properties'. (Remember *Schoolhouse Rock*?) In fact, this characterization is very problematic. For one thing, the words *activity* and *property* are themselves nouns! And what about nouns like *work*, *nap*, *fear*, *idea*, *touch*, *whistle*, *pleasure*, *completion*, *bend*, *threat*, *conversation*... Are these, and thousands of nouns like them, people, places or things? And what about the mass nouns we've seen, like *rice*, *water* and *emptiness*?

In fact, noun meanings can name people (*girl*), places (*home*), concrete things (*screwdriver*), abstract things (*idea*), properties (*intelligence*), activities (*work*)—if we can think of it, we can give it a name that's a noun.⁹¹

the person of the subject is: 3rd person singular past tense will give the /wʌz/ form of *be*, 2nd person singular present tense will give the /aɪ/ form, etc.

⁹¹ Some languages, like modern Persian (also known as Farsi), get by with quite a restricted inventory of verbs—between 50 and 200—and express most of the ideas that

Adjectives and verbs, on the other hand, are not so free. Adjectives always name properties, even when they're formed out of nouns, as in *wimpy* (from the noun *wimp*), or *penniless* (from the noun *penny*). Verbs always name either events (as in *to fall*, *to sleep*, *to build*...) or states (as in *to know*, *to want*, *to seem*...), even if they're formed out of nouns (*to hammer*, *to corral*).

Meaning-wise, then, nouns are the freest category. We could, roughly speaking, think of possible noun meanings as simply the possible *concepts*—the concepts that humans can invent words for, anyway.

6.3.1 Concepts: definitions or atoms?

The meaning of a content word is often explained in terms of its entailment relationships with other content words. To take one common example: it's supposed to be self-evident that if you know the meaning of *bachelor*, you will recognize that the entailment relations in example (108) below hold:

- (108) a. Statement: Chris is a bachelor.
 b. Entailment 1: Chris is a man.
 c. Entailment 2: Chris is not married.

If you were trying to teach someone else what the word *bachelor* meant, you might very well say, "A *bachelor* is an unmarried man". Lexical entailments like this—entailments that come from within the meaning of a word⁹²—are clearly a very important part of our knowledge of meaning.

English expresses with verbs by using a noun-verb combination. To get a feel for this, it would be as if we always said 'give an invitation to' rather than 'invite', or 'take a fall' rather than 'fall, or 'have a belief that...' rather than 'believe that..'

⁹² Lexical entailments like this contrast with *syntactic* entailments, like the entailment between 'Flossie is a brown cow' and 'Flossie is brown', where you don't even have to know the exact meaning of 'brown' to know that it's entailed by 'Flossie is a brown cow'. Syntactic entailments are due to the structure of the sentence; lexical entailments are due to the meaning of the word itself.

There are basically two approaches towards these kinds of lexical entailment relations. The first holds that the entailments of a lexical item *are* the meaning of that item. That is, instead of having a concept BACHELOR, we have the complex combination of the more ‘basic’ concepts UNMARRIED and MAN making up the semantic content of the listeme [/'bætʃlər/]N. On this approach, although there is a listeme [/'bætʃlər/]N, there is no ‘basic’ concept BACHELOR; there’s only UNMARRIED MAN. If this idea is right, most listeme meanings are made up of a combination of other concepts from some basic inventory of ‘fundamental’ concepts. We could call this the ‘definitional’ theory of meaning—meanings really are definitions, like you might find in a dictionary, and the entailment relations of *bachelor* reveal its mental definition. Everybody who knows the word *bachelor* must also know, at a minimum, the concepts UNMARRIED and MAN.

The second approach holds that lexical entailment relations are facts you learn *about* a listeme, but these relations aren’t the meaning itself. On this view, listemes mean what they mean—e.g. [/'bætʃlər/]N means BACHELOR. All concepts are primitives; one could call them ‘atoms of thought’. The list of entailment relations associated with a given concept, often called ‘meaning postulates,’ are just facts you learn (or discover) about that concept. We could call this the ‘atomistic’ theory of meaning.

One point in favor of the atomistic view is the fact that it seems clear that in most cases, not knowing all the entailments of a word doesn’t disqualify you from knowing the word. For instance, you can know and use the word *dog* accurately even if you don’t know the word *canine* or *mammal*—but both of those concepts are entailed by *dog*. If the entailment relationship between the concept DOG and the concept CANINE doesn’t have to be learned at the same time that the concepts themselves are learned, this fact is easily understood. We can conclude that concepts don’t consist of their entailments, but are independent atoms.

On the other hand, in favor of the definitional theory of meaning is the fact that it would explain exactly how lexical entailment works. If definitional theories are right, lexical entailment works exactly the same way as syntactic entailment. Recall that *Flossie is a brown cow* entails

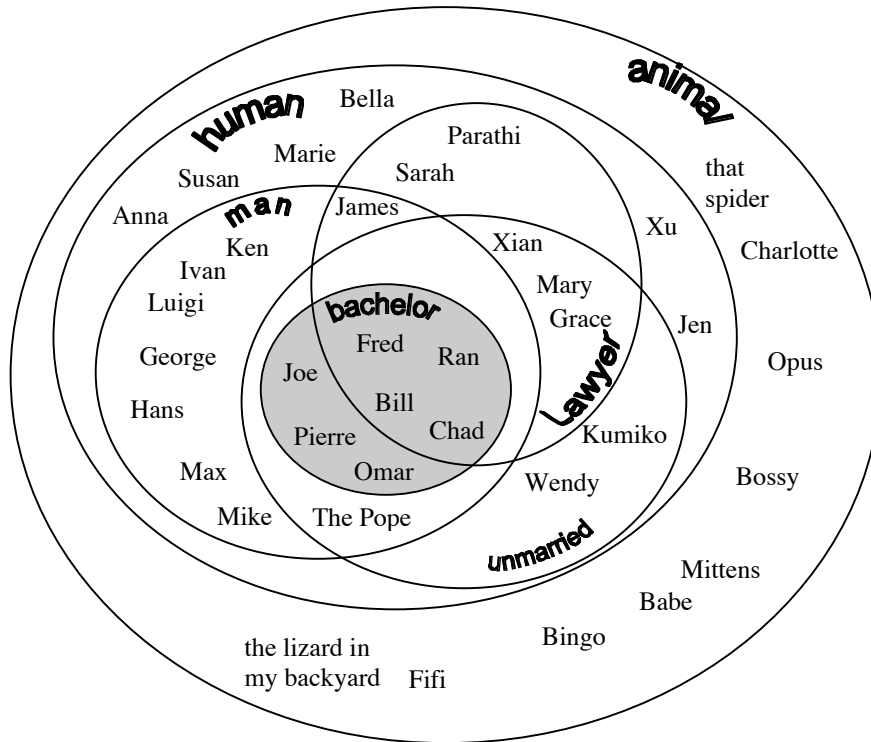
Flossie is brown. This syntactic entailment follows, obviously, because the concept BROWN is directly invoked (by the listeme [/'braʊn/]A) in both sentences. If the meaning of *bachelor* consists directly of the concepts UNMARRIED and MAN, which define it, then the fact that *Chris is a bachelor* entails *Chris is unmarried* can be explained in the same way as *brown cow* entailing *brown*, above—the first sentence about Chris directly invokes the concept UNMARRIED, and so entails the second sentence.

Since *both* theories of meaning hold that lexical entailments are an important part of our knowledge of or about concepts, however, we will look a little more deeply at them. Many researchers think that lexical entailment relations reveal important facts about the basic structure of the mental lexicon—the way that words are organized in the brain.

6.3.2 The Semantic Web

One way of thinking of the relationship between the word *bachelor* and its entailments is illustrated in the Venn diagram in Fig. 1 below. Thinking of *bachelor* as picking out a certain subset of all the things in the world, and other words as picking out other subsets of things, allows us to mathematically define the special relationship between the word *bachelor* and the words it entails: it's the subset relation. The set of things picked out by *bachelor* is a subset of the sets of things picked out by *man*, *unmarried*, and *human*;

Fig. 1: Entailments as subsets of entities



There is no entailment relationship between the concept ‘bachelor’ and the concept ‘lawyer’—if Jim is a bachelor, it doesn’t follow that he’s a lawyer—and this is reflected in the diagram, which shows that bachelors are not a subset of lawyers. On the other hand, there is an entailment relationship between being a lawyer and being human (lawyer jokes aside), and this is reflected in the fact that the set picked out by the concept ‘lawyer’ is a subset of the set picked out by the concept ‘human’.

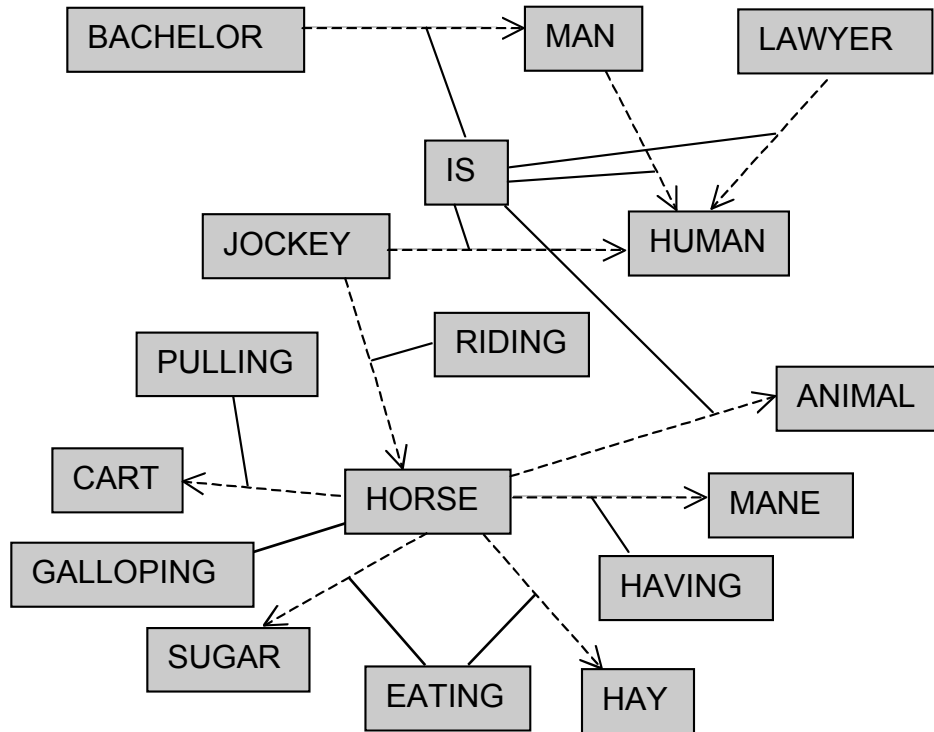
There’s a problem with this way of thinking about meaning,⁹³ though. Imagine that it so happened that, at some particular point in time, all the bachelors in the world also happened to be lawyers. Our intuitions

⁹³ This approach to meaning is narrowly *extensional*—the meaning of a word is entirely characterized by its extension, that is, by the set of things in the real world that are truthfully described by the term.

tell us that that situation wouldn't suddenly change the lexical entailments of *bachelor*—we still wouldn't think that *lawyer* is now part of the meaning of *bachelor*. It would just be a coincidence—in another second, some new bachelor could turn up who isn't a lawyer. But no new bachelor could ever turn up who wasn't male — if someone's not male, they just *can't be* a bachelor! We need a way to capture lexical entailments that talks about the relationship between word meanings, not just the relationships between different sets of entities in the world.

A more psychologically revealing approach evokes the metaphor of a semantic web. Concepts are points in our mental space. Two points, like *jockey* and *horse*, are connected to each other in the web if some other concept defines a (characteristic) relationship between them. For instance, the concept *riding* defines a characteristic relationship between jockeys and horses. The concept *eating* defines a characteristic relationship between horses and hay, and horses and carrots, and horses and sugar cubes. The concept *pulling* defines a characteristic relationship between horses and carts. The concept *having* defines a characteristic relationship between horses and manes. We can just think of the *is* (or *being*) concept as another potential connecting point between two other concepts. In that case, then, *is* will define a characteristic relationship between horses and animals, and between bachelors and men and between lawyers and humans. We could represent this kind of web of relationships graphically as in Fig 2:

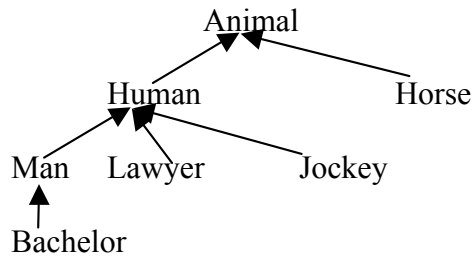
Fig. 2: The web of concepts



In Fig. 2, connections between concepts are represented as lines. Connections between two concepts that depend on a third, relational concept are drawn with a dotted line; the defining relational concept is joined to the dotted line by a solid line. So, for instance, *jockey* and *horse* are connected by the relational concept *riding*, so a dotted line connects *jockey* to *horse* and a solid line connects *riding* to the dotted line. In the same way, *man* and *bachelor* are connected by the relational concept *is*, so there's a dotted line that joins *man* to *bachelor*, and a solid line connecting *is* to the dotted line. (The connection between horses and galloping, on the other hand, is direct—no other entities are involved in galloping—so that line is solid.) As you learn new facts of this type—e.g. if you learn that ‘horses are mammals’—your web acquires more connections.

The lexical entailments we've been discussing are the ones defined by the 'is' relation. We could extract all the connections defined by the 'is' relation out of the semantic web and have a representation of just the lexical entailments between concepts—a *taxonomic* representation. The ones in the web in Fig 2 would look like this:

Fig. 3: A diagram of the *is* relations from Fig. 2

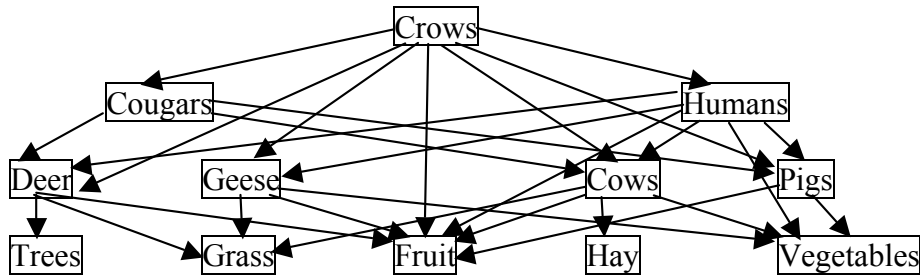


Here, the 'is' relation is just represented by the line connecting the lower concept to the upper concept.

taxonomy *n.* From the Greek roots *taxis* 'arrangement' and *nomia* 'name'. A classification of anything.

We could just as well extract another kind of relation from the web, and diagram that. For instance, if we were to extract the relation *eating* from our semantic web, we would end up with a diagram that is a representation of the food chain (or 'food web' as it is also, more accurately, called). A sub-part of such a diagram is shown in Fig. 4 below:

Fig. 4: A diagram of some 'eating' relations



Here, each line represents an 'eating' relationship, rather than an 'is' relationship. Since definitions are concerned with what things *are*, the 'is' relationship has a privileged position in the semantic web for people interested in meaning—but it's far from the only kind of relationship that's worth considering!⁹⁴

⁹⁴ Would one say that 'eats cows' is an entailment of 'human'? Of course not, right? This suggests that eating relationships are not as central to the meaning of words as 'is' relationships are—every 'is' relationship that 'human' enters into is true of all humans; all humans are mammals, for instance. However, every human does enter into *some* eating relationship with *something*. The key is that we drew our 'is' diagram assuming that the lines meant **ALL** Xs are Ys, while we've drawn our 'eats' diagram assuming the lines mean **SOME** Xs eat Ys'. If we drew an 'eats' diagram with the 'all' meaning, we might well end up with a diagram that looks more definitional—'humans' connected to 'food,' say. Is a human human if s/he never eats?

Exercise 4: Consider a semantic web made up of the following concepts: leg, hoof, knee, paw, dog, horse, mane, tail, claw. Draw a diagram of the ‘have’ relationships in this web (e.g. *dogs have legs*). In your diagram, the lines connecting the concepts represent ‘have’.⁹⁵

One interesting difference between the *is* relationship and the *eating* relationship is that *is*-ness is inherited from one pair of relations to another. If Dalmatians are dogs, and dogs are canines, then we can conclude (because we know the meaning of *is*) that Dalmatians are canines, right? But that’s not true for eating relationships. If crows eat cows, and cows eat hay, that doesn’t mean that crows eat hay, right? The meaning of *eat* doesn’t allow such transfer of properties.

Relations that behave like *is* have the mathematical property of *transitivity*. This is different from syntactic transitivity, which only applies to verbs and which just means they take a direct object. Mathematical transitivity is a property that any relation can have — not just verbs. So, for instance, the relation denoted by the preposition *above* is transitive: if the book is above the desk, and the desk is above the carpet, then we can conclude that the book is above the carpet, right? Other relations that have this property are *sibling of*, *equals*, *greater than*, *less than*, *taller than*, *hotter than*, etc.

⁹⁵ Just as representing the ‘is’ relationship is called taxonomy, representing this kind of ‘have’ relationship (which we can also think of as a ‘part of’ relationship) is called *meronymy*. It has some surprising linguistic consequences, as we’ll see in a moment.

Exercise 5: Another mathematical property that relations can have because of their meaning is *symmetry*. If a relation is symmetric, the statement ‘X RELATION Y’ entails the reverse, ‘Y RELATION X’. So, for example, the relation ‘beside’ is symmetric: ‘The book is beside the cup’ entails ‘The cup is beside the book.’ So is the relation ‘marry’: the statement “Mary married John” entails the statement “John married Mary”. Consider the relations below, and decide if they are symmetric, transitive, both, or neither:
meet, sibling of, brother of, ancestor of, play (with), in contact (with), converse with

There are other properties besides symmetry and transitivity that relations can have by virtue of their meaning, but these are enough for you to get the idea. The majority of relations in natural languages have neither of these properties, but the ones that do are fairly special. For one thing, they are the relations that enable us to reason about numbers—they reflect our inherent mathematical understanding.

In this section, we have examined the notion of word meanings, trying to decide if word meanings are made up of other, more basic word meanings, or if they are atoms. We tentatively concluded that they are atoms, but that they are intricately interconnected in a web-like fashion, in which some concepts define relationships between other concepts. The *is* concept defines the important set of relationships that we call *lexical entailments*.

6.4 *Relationships and Argument Structure: Meaning and grammar*

Let's think about our categories of concepts again for a minute, (still without worrying about syntactic category). In our diagram, we had two fundamentally different kinds of concepts: the ones (like *eat* or *is*) that necessarily involve a relationship with other concepts, and the ones that just seem to be independent units (like *horse* or *bachelor*). The independent ones can be connected to each other via a relationship concepts, but they themselves can't connect.

Relationship concepts can themselves be connected to each other by another relationship concept, as in the sentence *Seeing is believing* — the relationship concept *seeing* is connected to the relationship concept *believing* via the relationship concept *is*. So relationships can connect other relationships. But non-relational concepts can't connect other concepts — there's no way, for instance, for the concept *wallet* to indicate a relationship between two other concepts. We have two fundamentally different kinds of concepts: ones that are necessarily relations, and ones that aren't.

The meanings of relational concepts specify how many other concepts they relate to. It can be just a single one, like *gallop*—*gallop* only needs one other concept (like *horse*) to relate to. We've seen many concepts that need two other concepts — *eating* and *riding* are two examples; neither eating nor riding would make sense if there wasn't both an eater and a thing eaten, or a rider and a thing ridden. Some concepts specify a relationship between *three* other concepts — *put* and *give* are like that. In order to make sense, *put* needs to express a relationship between a putter, a thing put, and a location; *give* expresses a relationship between a giver, a thing given, and a recipient. A very few concepts seem to relate four arguments: *trade*, for instance, needs a trader, a thing traded, someone to trade with, and a thing to trade for.

If you look back at the diagram of the semantic web (Fig. 2), you'll see that it has one feature that we haven't discussed yet. Some of the dotted lines connecting concepts are not just lines — they're *arrows*. What do you think this is trying to indicate?

If we just used a non-directional dotted line to indicate the *riding* connection between *horse* and *jockey*, how would we know who's the

rider and who's the ridee? The web might be indicating that *horses ride jockeys*, not that *jockeys ride horses*. Relational concepts not only tell you how many other concepts they connect to, they tell you who does what to whom. Relational concepts impose a particular structure on the concepts they're connected to — that's why *John loves Mary* doesn't mean the same thing as *Mary loves John*. Borrowing a term from logic, linguists call the concepts that are connected by a particular relation the *arguments* of that relation.⁹⁶ A relation like *gallop* takes one argument, a relation like *eat* takes two arguments, and a relation like *give* takes three arguments. In each case, the arguments must be of particular types. The structure the relation imposes on the other concepts is called its *argument structure*.

6.4.1 Argument structure

There are only a few kinds of argument structures that relational concepts can have. Once we define a few general kinds of argument structure, we can categorize practically any new relational concept that comes along. Relations tend to impose particular kinds of *roles* on their arguments. That is, relations require arguments with certain semantic properties.

6.4.1.1 *Mary kissed John*: Agent-Theme verbs

Perhaps the most typical kind of argument structure a relation can have is one where one argument is doing something to another argument. Examples of relations that involve this kind of argument structure are *eating, riding, twisting, kissing, poking, crushing, lifting*, etc. The argument that's doing the action is usually called the Agent (or sometimes Causer, especially if it's inanimate), and the argument that's having the

⁹⁶ Of course, this meaning of *argument* is very different from the most common meaning of *argument*, where it is used to refer to a disagreement or debate, or a statement intended to prove a point. The meaning here is derived from the term *argument* as it is used in predicate logic and math, where a given function's value may depend on one or more independent variables. The variables are called the *arguments* of the function because their value determines the output of the function, by analogy with the way a particular point in a chain of reasoning may determine the outcome of that chain of reasoning.

action done to it is usually called the Theme (or sometimes Patient). The subject bears the Agent role, and the object bears the Theme role.

6.4.1.2 *Bill ran* and *Bill fell*: Agent-only verbs and Theme-only verbs

As we noted above, sometimes a relation involves just one other argument. Relations that involve just one other argument fall into two broad classes: one where the single argument is in control of what's happening, and one where the single argument is not in control. So, for instance, *running*, *singing*, *galloping*, *fidgeting*, *partying*, and *smiling* are cases where the single argument is in control; the single argument of these relations is called an Agent. On the other hand, *collapsing*, *growing*, *happening*, *shining*, and *falling* are cases where the single argument isn't in control; the single argument of these relations is usually called a Theme. Sometimes it's difficult to tell the difference between the two (where do you think *laughing* belongs? What about *arriving* or *sleeping*?). One good clue is that the Agent ones usually require their single argument to be animate; the Theme ones allow their single argument to be inanimate. So, for instance, a book can *fall* but it can't *fidget*; that's a clue that the *fall* relation takes a Theme argument, rather than an Agent one.

6.4.1.3 *Mary knows French*: Experiencer-Theme verbs

There are also two-argument relations where neither argument is an Agent. In the sentence *John likes dogs*, *John* isn't actually doing anything, and the dogs aren't having anything done to them. Similarly for the relations expressed by the verbs in these sentences: *Mary knows French*, *Bill wanted the apple*, *Sue doubted the evidence*, *Bob believed the story*, *Jill hates custard*. In all these cases, the relation seems to express a feeling or attitude on the part of one argument with respect to the other argument. Here, the argument doing the feeling is called an Experiencer, and the argument that is the target of the feeling is again called a Theme.

6.4.1.4 *Mary knows that Bill is coming*: Experiencer-Proposition verbs

One thing that's interesting about these two-argument relations with Experiencers is that they all allow their other argument to be

something besides a simple Theme—they can express a relationship between an Experiencer and a Proposition, as well. A proposition is a complete statement about some state of affairs. As well as *Mary knows French*, we can say *Mary knows **that Bill is coming to the party***, where instead of a Theme, we have the Proposition *that Bill is coming to the party*. Similarly, we can say *Sue hated (it) **that Bill was coming to the party***, or *John wanted **Bill to come to the party***, or *Jane doubted **that Bill was coming to the party***, or *Bob believed **that Bill was coming to the party***. This isn't true of the Agent-Theme verbs we described above: there's no way to make sense of a statement like *#John kissed that Bill came to the party* or *#Mary lifted (it) that Bill was coming to the party*. It seems to be systematic that relational concepts with Experiencers and Themes can also relate their Experiencers to Propositions.

6.4.1.5 *Mary said that Bill left*: Agent-Proposition verbs

There are also relational concepts that connect Agents to Propositions, for example, *John **said** that Mary left*, *Mary **claimed** that Joe had done his homework*, *Bill **demanded** that Jack apologize*, *Sue **inquired** whether Bill had left*. Some of these also accept the Agent-Theme structure, where instead of a proposition, they take an appropriate direct object: *John said the words*, *Bill demanded an apology*—but some don't: **Sue inquired the question*, **Mary claimed Joe's completion of his homework*.

6.4.1.6 *Mary donated a present to the library*: Agent-Theme-Location, Agent-Theme-Proposition

Finally, some verbs express relations between *three* arguments: an Agent (doing the action), a Theme (undergoing the action) and a Location (receiving the Theme). *Give* is like this, as in *John gave Bill a book*, and so is *donate*, and *send*, *pass*, *throw*, *convey*, *put*, *transfer*...

Some of these verbs, if their meanings are appropriate, also allow a Proposition, as well as a Theme (just like *say* does, above): *John told Mary that Bill left* (vs. *John told Bill the story*), *Mary asked John whether Bill left* (vs. *Mary asked John the question*).

Exercise 5: Categorize the following verbs into the eight categories of argument structure listed above, also given below. (Warning: Some verbs belong in more than one category!) Write a sentence illustrating each of the argument structures associated with a given verb

Argument Structures to use

(1) Agent-only (2) Theme-only (3) Agent-Theme (4) Agent-Proposition (5) Experiencer-Theme (6) Experiencer-Proposition (7) Agent-Theme-Location (8) Agent-Theme-Proposition

Verbs to categorize

break, eat, insist, invite, wink, divide, ask, repeat, think, bake, inform, explode, scream

6.4.2 Derivational morphology and argument structure.

Now we can understand the semantic effects of some of the derivational morphemes we considered in the last chapter. Many of these morphemes' meanings refer directly to argument roles like Agent, Theme, etc.

Consider the derived nouns below:

- (109) a. employer, climber, fighter, rider, writer, sleeper, singer...
 b. actor, bettor, operator, instigator, abductor, aggressor
 c. alarmist, contortionist, cartoonist, journalist, activist

As we've seen before, the *-er* nominalizing suffix refers to 'someone who does X' — now we know the name for it: *-er* makes nouns referring to the Agent of the verb it attaches to. The homophonous suffix *-or* does the same thing. The suffix *-ist* does the same thing — with one interesting difference: it attaches only to nouns or adjectives: *active*, not *act*, *contortion* not *contort*. Nonetheless, it still refers to the Agent of the action named by or associated with the stem it attaches to.

Now consider the following derived nouns:

- (110) a. addressee, advisee, nominee, invitee, employee, trainee
 b. attendee, enrollee, confessee, absentee, , retiree

In a scenario describable as *Jane addressed Bill*, Bill is the addressee. Similarly, in *Jane employed Bill*, Bill is the employee, in *Jane trained Bill*, Bill is the trainee, etc. The *-ee* suffix derives nouns that refer to a Theme argument—one that isn't in control of the action described. It doesn't have to be a Theme that is an object — intransitive verbs with subject Themes can take the suffix too, as shown by examples like *attendee* in (110)b.

The *-ee* suffix makes nouns that refer to Themes, but there's a particular restriction on the kinds of Themes they can refer to. Consider a noun like *payee*, or *drivee*. The verbs that these are derived from, *pay* and *drive*, normally take inanimate theme objects — *She paid \$50*, or *He drove a car*. But the *payee* and the *drivee* don't refer to an amount of money, or a vehicle. Rather, they refer to the animate object of a sentence like *She paid Bill*, or *He drove Miss Daisy*. The *-ee* suffix makes nouns that refer to animate, human Themes only.

Other suffixes refer to the argument structure of verbs as well. For instance, the passive morpheme *-en* or *-ed* removes the Agent argument from the argument structure — *Mary ate cake* becomes *Cake was eat-en*; *John assigned the homework* becomes *The homework was assign-ed*.

6.4.3 Subtleties of argument structure

The above types of argument roles are not really an exhaustive characterization of verbal semantics, of course. There are a number of further refinements that are worth mentioning, but I'll only discuss two: verbs that require *intentional* subjects, and verbs which express the *creation* or *destruction* of their object.

6.4.3.1 In control of the situation: intentional subjects

There's a subtle difference in meaning between *killer* and *murderer*, which you can also see at work in the following set of examples:

- (111) a. John killed Bill.
 b. The crash killed Bill.
 c. John murdered Bill.
 d. #The crash murdered Bill

Obviously, only a certain kind of Agent can *murder* someone, while just about anything can *kill* them. The crucial difference is that *murder* requires an intentional Agent for a subject; while *kill* does not. This distinction is even partially encoded in the legal system, in the difference between the two crimes *murder* and *manslaughter*. It seems, perhaps, as if we need to distinguish between true Agents (like *John*, who can do things on purpose) and mere Causes (like *the crash*, which can't do anything on purpose).



We can also see this difference showing up in more subtle ways in the use of the English verb *have*:

- (112) a. John has a plastic bag.
 b. John has a big nose.
 c. #The tree has a plastic bag.
 d. The tree has a thick trunk.

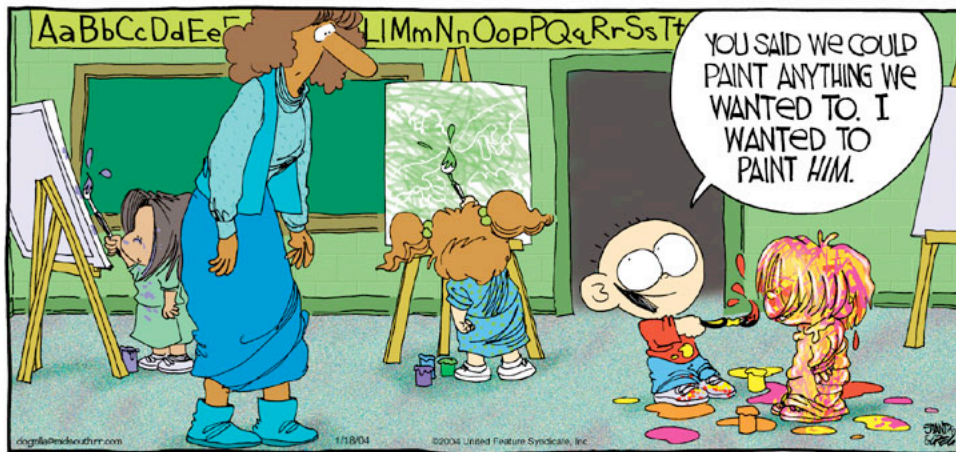
It sounds odd to talk about the tree having a plastic bag, doesn't it? If we add a location preposition phrase *in it* to the sentence, it's fine (*The tree has a plastic bag in it*), but just by itself, the sentence is odd. When we're talking of a person, like John, however, it's quite natural to say that he has a plastic bag.

The difference between John and a tree is that John can possess things *on purpose* (just like he could murder someone on purpose), while a tree can't. It's ok for a tree to possess something just because that's the way it's built ('meronymically,' as in (112)d)⁹⁷, but it's not ok for it to possess something that's not a part of itself. Intentional subjects of *have*, though, can do either kind of possession.

6.4.3.2 Being created or being affected? Two kinds of Themes

THE BUCKETS

BY SCOTT STANTIS & GREG CRAVENS



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In the *Buckets* cartoon above, there's been a difference of opinion between the teacher and Eddie about what meaning of *paint* is the one at issue. The teacher meant something like *create a picture (of anything you want!) by painting*, while Eddie chose to interpret her as meaning *cover (anything you want!) with paint*.

Paint is a bit of an unusual verb in this regard. *You can paint anything* might be discussing either an act of creating whatever is the

⁹⁷ Remember *meronymic* possession? That is the 'part-of' kind of possession, also sometimes called *inalienable* possession. It was the kind of possession you diagrammed in Exercise 4. Its opposite — the kind of possession that animate things can be involved in — is called *alienable* possession.

object of *paint* (as the teacher intended) or an act of putting paint on whatever is the object of *paint* (as Eddie interpreted). But there are lots of verbs where only one or the other meaning is available.

(113) a. Verbs of creation

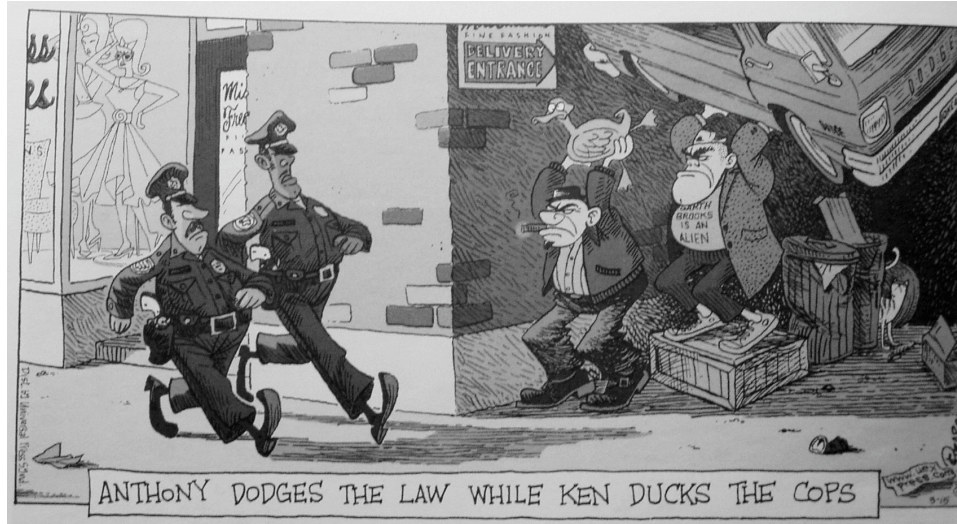
build, write, create, invent, devise, imagine, produce, construct...

b. Verbs of location change

water, oil, saddle, string, butter, varnish, blindfold, shoe, salt...

You can't use *write* to mean *put writing on*, (**John wrote the sheet of paper*); and you can't use *butter* to mean *create something from butter* (**John buttered a model airplane*). So not many verbs are like *paint* — but there are groups of verbs whose meanings correspond to the two meanings available for *paint*. In the set of roles we currently have available, this distinction isn't captured. For reasons like this, some linguists distinguish between Patients (pre-existing things that are the recipients of some action) and true Themes (items which are created or destroyed as a result of the verbal action).

It's worth noting that all of the Location verbs mentioned above are formed from already existing nouns. This process of verb formation is very productive in English today, and is exploited to good purpose on a daily basis. Sometime when you're reading, notice how many of the verbs you run into can also be used as nouns!



6.5 Content meanings interacting with function meanings

Remember the funny effect we saw in section 6.2.5 where the meaning of the present tense seemed different with different verbs? With verbs like *run* or *eat*, it carried a habitual interpretation: *John eats apples* means that John habitually eats apples, not that he's eating apples right now. But *John wants apples* does mean that he wants apples right now. Why the difference?

6.5.1 Event structure and tense

Verbs like *run* and *eat* describe actual activities—events—that involve movement or change — some energy is needed for the scenarios they describe. Verbs like *have*, *want*, *know*, *resemble* or *believe*, on the other hand — and *be* — describe states: relational situations which simply are — they don't require any input of energy to maintain, and they don't involve movement or change.

Events can't get a present-tense meaning with the regular present tense morphology, but need the progressive *is...-ing* form. Conversely, states can take the regular present tense, but can't take the progressive. *#John is resembling Mary* sounds quite odd. Speakers of other languages

who are learning English often find that this distinction is tricky to learn; other languages' tense systems make different distinctions.

There are a few different subtypes of events, each with its own characteristic kind of meaning, having to do with the way the event unfolds. Some events, like *melting*, have a natural stopping point — something can only melt until it's all the way melted — after that no more melting is even possible. This kind of event, that has a definite completion point, are called *Accomplishments*. Other events, like *singing*, just go on and on until some arbitrary stopping point — they're pretty much the same from start to finish, and the only thing limiting how long they go on are extraneous factors, like how tired their agent is, or whether the doorbell rings. These are called *Activities*. A third type of event, like *noticing*, happen instantaneously — you can't notice something halfway; either you've noticed it or you haven't. These are called *Achievements*.

These kinds of inherent properties of event-denoting verbs become obvious when you try to combine them with other words that have temporal meanings.

(114) *Different kinds of events with temporal modification*

a. Accomplishments

“halfway”:
 “take [timeframe] to finish”
 “for [timeframe]”:

ok The ice melted halfway.

ok The ice took an hour to finish melting.

? The ice melted for an hour.

b. Activities

“halfway”:
 “take [timeframe] to finish”
 “for [timeframe]”:

? Sue sang halfway.

ok Sue took an hour to finish singing.

ok Sue sang for an hour.

c. Achievements

“halfway”:
 “take [timeframe] to finish”
 “for [timeframe]”:

? The bridge exploded halfway.

? The bridge took an hour to finish exploding.

? The bridge exploded for an hour.

These tests are just approximate; for nearly every one you can imagine a scenario which would make the sentences marked with ? acceptable. For instance, although ‘explode’ is an achievement, and so isn’t compatible with an extended duration, *The bridge exploded for an hour* could appropriately describe a situation in a cartoon, for example, where a bridge exploded over and over again, or where the whole bridge was rigged with many small charges, each of which exploded in sequence, so the whole process of repeated small explosions took an hour. But without such special accommodating imagination, the verb *explode* refers to a single, very fast event — an Achievement.

Exercise 6: Use your intuitions and the tests above to categorize the following verbs into event classes: States, Accomplishments, Achievements and Activities.

sleep, bend, contain, arrive, juggle, cost, flip, divide

6.5.2 The mass/count distinction and event structure

We saw in section 6.2.2 above that there are two kinds of nouns in English: mass nouns, like ‘dough’ and count nouns, like ‘cookie’. And we saw that certain determiners can go with one kind of noun but not the other — *many* goes with count nouns, but *much* goes with mass nouns. Similarly, if we want to use a noun without a determiner, we have to add plural -s to count nouns but we can use mass nouns without determiners just as they are.

In the same way that we can use *for-an-hour* type adverbs even with Achievement events like *explode*, given enough imagination, we can also use mass nouns with count determiners and count nouns in mass environments. Sometimes it takes a lot of imagination, sometimes not so much. For instance, *coffee* is a mass noun, because it’s ok with the determiner ‘much’ (*I don’t drink much coffee*), and because you can use it without a determiner and without a plural -s: (*Coffee makes me jumpy*).

But it's not too hard to understand what someone means when they say *I bought two coffees this morning*, or *The coffees you ordered will be ready in a minute* — you automatically imagine that the person is talking about either packaged coffee, in cups or (if not prepared) in bags. On the other hand, with mass nouns which are not so easily imagined in units, it's strange to say *I bought two paints this morning*, to mean two cans of paint. Here, you're more likely to imagine that the speaker is talking about two *kinds* of paint. The point is that it's not impossible for mass nouns to go with count determiners, just as it's not impossible for Achievement verbs to go with Activity adverbs—one just has to use one's imagination a little to figure out what the right 'unit' for interpretation is. The particular units you imagine will be affected by general knowledge you have about the noun in question, like the fact that *coffee* is usually served in cups and *paint* comes in different colors and textures. You are employing what some psycholinguists call the Universal Packager

The same thing goes for count nouns used in mass contexts. If I say something like *That baby has cookie all over his face*, you know I don't mean individual cookies, but rather cookie crumbs—the amorphous substance of cookies. Similarly, looking at your windshield after a long road trip, one might say, *There's bug all over the windshield*, to express the idea that there's bug-substance on there, rather than individual bugs. But again, one has to use one's imagination—this time, exploiting the Universal Grinder.

The notions of 'unit' vs. 'substance' ('packaged' concepts vs. 'amorphous' concepts) is a bit like the notion of 'event having an inherent stopping point' vs. 'event with no inherent stopping point' that we appealed to above to distinguish Accomplishments from Activities. Activities are internally unstructured — one moment of 'running' is very much like any other, just like one piece of 'dough' is very much like any other. Accomplishments have some internal structure, though—the first moment of a 'melting' event is different from the last one, because in the last one, the object that was melting disappears. Similarly, count nouns have internal structure: the top half of a 'telephone' is different from the bottom half. One way of thinking about the common denominator between event types and noun types here is to sort them out by whether they have inherent *boundaries* or not. The boundaries that define an instance of

‘telephone’ are important—half a telephone is not a telephone—but the boundaries that define an instance of ‘water’ are *not* important—half a puddle of water is still water. Similarly, half of an event of ‘melting away’ is not itself an event of melting away, but half an event of ‘running’ is in fact itself a running event. Count nouns and Accomplishments are [+bounded], while mass nouns and Activities are [-bounded].

And what is really interesting is that the two properties can interact. The structure of an event can change depending not on the properties of the verb itself, but on the properties of the elements it combines with — particularly the object. Take the verb *write*. When it’s intransitive, it’s a classic [-bounded] Activity: *?He wrote halfway* sounds odd, and *He wrote for two hours* sounds fine. But as soon as you add a [+bounded] count noun object, like *a story*, things reverse: *He wrote the story halfway* seems plausible but *?He wrote the story for two hours* is little off—*write a story* is a typical [+bounded] Accomplishment. Now try giving it a [-bounded] mass noun object, like *prose*. Now *?He wrote prose halfway* is weird but *He wrote prose for two hours* is fine—*write prose* is a typical [-bounded] Activity again. The boundedness of the whole event depends on the boundedness of the object involved. The notion [±bounded] applies equally well to events and to concrete things—it’s an important property of concepts in general. When you use the Universal Packager or Universal Grinder, you’re trying to imagine what the meaning of a concept would be with its normal value for [±bounded] reversed.

6.6 Conclusions

In this chapter...

to come: problem sets, further readings