The point of talking is to describe the way the world is, the way it changes or stays the same. Verbs play a critical role in that endeavour. Intuitively, verbs (or, more precisely, verb senses) describe categories of situations or events. One sense of *eat* describes a category of situations in which one entity ingests another one; one sense of *believe* describes a kind of state humans can be in with respect to a representation (or proposition). Discussing the semantics of verbs amounts to trying to answer several questions, some pertaining to the relation between our cognitive categories and our lexicons, some pertaining to the relation between verb meanings and the morphosyntax of clauses. Here is a list of some of these questions:

1. Do categories of situations named by verb stems or described by sentences fall into natural classes?
2. Can the meaning of verbs be decomposed into smaller components or primitives?
3. How complex can the categories of situations described by a verb stem be?
4. How should we compose the meaning of verbs and their dependents to derive natural classes of situations?
5. Are there constraints on the kind of situation properties that morphosyntax can be sensitive to?

1 The nature of events

Clearly, this chapter cannot answer all of these questions, or even one completely. Its goal is more modest: to articulate the way in which attempts to answer these questions have shaped research in event semantics. I begin with two general issues about the notion of event. The first issue pertains to what an event is. We can go with Aristotle’s definition of verbs: “A verb is that which, in addition to its proper meaning, carries with it the notion of time” (*De Interpretatione*, 3). Or, we can define events in a way less dependent on Greek morphology as processes (or, rather, classifications of processes) that are less stable than those constituting individuals (Link 1997). Whatever the metaphysical underpinnings of the distinction between entities (individuals) and situations, the difference is typically reflected in the arity of the predicates that name entity and situation categories. Since Davidson (1967), it is widely agreed that predicates of situations include an additional event argument position compared to predicates of entities: Whereas *dog* is a one-place predicate that categorizes entities, *walk* is a relation between an event and an animate entity. Whether names of stative events (e.g.
believe) also describe situations (and therefore include an event argument position) is a matter of debate. But, at the very least, they include an additional time argument (Galton 1984), something not true of categories of entities.

The second issue pertains to the structure of events and predicates that describe them. Kenny (1963) presents us with a challenge that takes the following form. If we define an event of eating as a relation between an eater and some food, how can we account for the entailment between the proposition expressed by (6) and that expressed by (7) or between the proposition expressed by (6) and that expressed by (8)? Whatever device we propose, Kenny fears, we will end up saying that predicates of actions are of variable polyadicity, or worse, infinite polyadicity. Now, we would not have to worry about this second issue if there was a principled way of distinguishing between how (6) relates to (7), and how (6) relates to (8) or (9). The traditional answer within linguistics is to distinguish between arguments and adjuncts of the predicate associated with the meaning of the verb. The relation described by the verb only involves arguments. But, of course, it begs the question of what constitutes arguments of a predicate.

(6) John ate.
(7) John ate something.
(8) John ate somewhere.
(9) John eats sushi with something.
(10) Bill tried to cut his meat with a butter knife.
(11) Marie hid her pearl earrings in the drawer.

One proposal (Koenig et al. 2003) is that arguments are those participants in an event that are required by the event category and are specific to a small range of event categories. The difference between sentences (6) and (7) and sentences (6) and (8) or between sentences (6) and (7) and (6) and (9) is explained as follows. Eating always requires food, so even when there is no syntactic expression that realizes the food argument, as in (6), it is understood. In contrast, you do not need an instrument to eat. You can just crash your mouth onto the plate (although with some cultural consequences). As a result, one can infer from the truth of (6) the truth of (7), but one cannot infer from the truth of (6) the truth of (9). Now, if obligatoriness was all there was to argumenthood, the location expressed by somewhere in (8) would constitute an argument and Kenny’s concern would be back in full force. However, that an event took place somewhere and that it took place at some time does not tell us much about what kind of event occurred because almost all events take place somewhere and at some time (an exception, if they describe stative events, are sentences like Two plus two equals four). So in contrast to the eater and food arguments of eat, which tell us something about the event because they bear distinctive properties (e.g. causality in the case of the eater and changing state in the case of the food), there are no location and time properties that characterize events of eating (i.e. that serve as criterial properties for us to categorize an event as an event of eating). To see the relevance of obligatoriness and specificity to defining argumenthood for event-types, it is useful to compare the instrument of eat in sentence (9) and the instrument of cut in sentence (10). Events of cutting like those described in (10) require some kind of instrument (see Koenig et al. (2003) for qualifications). So in contrast to events of eating meat, events of cutting meat entail using something to cut the meat. Similarly, the location expressed by in the drawer in (11) differs from the location where eating occurs in (8). This is because almost all events take place somewhere, but not all verbs are like hide in describing situations where some entity is moved and ends up in a location as a result.
That kind of location is specific to a restricted set of situation categories and as such helps characterize the situation as an event of hiding.

2 Classifying events on the basis of time schemata

Having briefly addressed issues that pertain to the nature of events, I now turn to ways in which semanticists have tried to answer the questions I raised in the introductory paragraph. I will start with the issue of what kinds of categories of situations one can recognize. One very prominent classification of events distinguishes between four distinct kinds of categories of situations (Vendler 1957): states, activities, achievements, and accomplishments (see Chapter 19). The literature has often been unclear about whether these categories are categories of verb meanings, categories of sentence or clause meanings, or categories of predicate meanings, an issue that started with Vendler himself. I assume that these categories are categories associated with the meaning of sentences or clauses. Vendler distinguished kinds of situation categories on the basis of what he called time schemata; that is, states, activities, achievements and accomplishments are distinct kinds of situation categories because each relates differently to the time during which it occurs or holds. Loving is an example of states, running is an example of activities, drawing a circle is an example of accomplishments, and spotting is an example of achievements. Many “tests” of whether a clause or sentence describes a state, an activity, an achievement, or an accomplishment have been proposed starting with Vendler’s own. We present here a subset of the tests (for English) provided in Dowty (1979).

(12) Bill loves/*is loving soccer.
(13) Bill spots a stallion a mile away/*is spotting a stallion.
(14) Bill ran (for an hour).
(15) Bill drew a circle (in an hour).

State descriptions are not welcome in the progressive, as (12) shows. Intuitively, the progressive indicates that a dynamic situation is ongoing, and static situations are therefore incompatible with it. Achievements are also not particularly welcome (without a change in meaning) in the progressive. This is because achievements are “punctual” and being ongoing makes little sense if the event occurs in an instant. Achievements, though, differ from states in that achievement verb constellations receive a habitual reading when combining with the English simple present. Thus the simple present in (13) describes a habit or habitual ability of Bill’s, whereas in (12) it describes Bill’s ongoing affection for soccer. Activities unfold through time homogeneously, as sentence (14) shows: any part of an event of running is an event of running. So, if Bill ran for an hour, he ran at all times during the hour (excluding intervals of time that are too small and irrelevant interruptions, e.g. bathroom breaks). In contrast, accomplishments do not unfold through time homogenously. If Bill drew a circle in an hour, it took him an hour to draw the circle and the same description – “drawing a circle” – is not true of any interval that is strictly smaller than the hour he took. The fact that activities are true at all times during an interval is often called the subinterval property; the fact that accomplishments (and achievements) are not can be called the anti-subinterval property. Bach (1986), Herweg (1991), Talmy (2000), and others have noted the parallel between activities and mass nouns on the one hand and accomplishments and count nouns on the other. Any subpart (that is not too small) of a mass of butter is butter, but any subpart of a horse is not a horse.
Further distinctions among Vendler-style classes can be made. Bach (1986), for example, distinguishes between happenings and culminations. The change for the former (The balloon popped; John noticed the open jar of peanut butter) occurs “instantaneously” without a preparatory phase. The change for the latter (John reached the summit) may be instantaneous, but there must be a phase leading to the change. You cannot reach the summit without some prior motion (e.g. prior walking). So, for most speakers, if Scottie (in Star Trek) were to beam John up onto the summit of the Everest, the description John reached the summit would be inappropriate, because standing on top of mount Everest after not standing there is not enough for an event to be described as a reaching event. One has had to first walk up (or otherwise move up) the mountain.

Similarly, one can distinguish among states. Some states are permanent (e.g. Mont Blanc is high, whales are mammals). Whales will always be mammals; mountains do not change height within the confines of our lifetimes. But other states are more temporary. Bach (1986) cites John was drunk last night; one hopes John will sober up. Grammatical formatives can be sensitive to distinctions among states. To take a well-known example, Spanish uses distinct copulas for permanent and temporary states. The copula ser is used in (16a) because individual traits do not change easily whereas the copula estar is used in (16b) because a house’s dirtiness is more temporary.

\[(16)\]
\[a\] Soy impaciente
“I am impatient”
\[b\] La casa está sucia
“The house is dirty”

As it is hard to think of statements such as I am impatient as goings-on (and even harder for statements like Mont Blanc is high), the existence of permanent states suggests that we may not be able to reduce all situations to processes or to goings-on no matter how abstract they are, contrary to what Link (1997) claims.

One can distinguish even further among states: Those that follow some dynamic change that is permanent once reached (The theorem is proven; once proven the theorem remains proven indefinitely) and those that can be reset (The keys are hidden; the keys can later on be in plain view). Only with the latter (which Kratzer (2000) calls target states in contrast to the former, which she calls result states) are adverbs such as still appropriate, since only the latter can be reset. Note that result or target states are what perfect markers, according to some theories, entail to hold at reference time for their so-called resultative interpretations (I have strained my knee so I cannot run).

3 The ins and outs of predicate decomposition

The second question that has occupied semanticists interested in categories of situations is whether verb meanings can be decomposed into smaller components or primitives (see Chapter 12). This issue is not unrelated to the first question, as the components into which verb meanings can be decomposed constitute an implicit categorization of verb meanings and are often inspired by or related to Vendler-style categories. For example, if accomplishments are analyzed as situations that include changes that take time, the fact that they do not obey the subinterval property is easily accounted for: a change takes a certain amount of time and the change will not have occurred before that time. The decomposition of the meaning of verbs into smaller components goes back to the 60s and
Generative Semantics (see Lakoff (1970)). In its original incarnation and many of its offshoots, the decomposition of verb meaning was not only an analysis of event categories into subparts, but also a decomposition of representations of the meaning of verbs into subparts, which is why it is often known as predicate decomposition. The original impetus for decomposition was partly based on morphological relations (hard/harden) and partly on ambiguities, particularly that of almost or again (see Dowty (1979) for details). The first motivation for predicate decomposition ran as follows: The morphological rule deriving redder from red is easier to state if we can recognize in the meaning of redder the meaning of red. So, if we analyze informally the meaning of red as describing a particular category of state, we can state that the semantic effect of -en suffixation is to derive a meaning that describes situations that cause an entity to become red when it was not before. If we represent the meaning of a base adjective as P (Y), the meaning of a derived verb can be represented as CAUSE (X, P (Y)).

The second motivation for predicate decomposition is that the presence of some adverbs leads to ambiguities that are best explained by assuming the meaning of verbs is complex rather than atomic; the ambiguities can then be analyzed on a par with ambiguities of scope.

(17) Joan opened the door again.
(18) Joan almost freed the mouse from the trap.

Consider sentence (17). It can be used to describe situations in which Joan, who has a compulsion to try to open doors, performs the act of opening a door yet another time. But it can also be used to describe situations in which the door was previously open, the wind shut it, and Joan makes sure it is open again. Consider sentence (18). It can be used to describe situations where Joan was about to free the mouse because she is ambivalent about traps, but then thought better of it given her revulsion at the sight of mice. It can also be used to describe situations where Joan fiddles with the trap and manages to loosen its grip on the mouse, but cannot quite get the mouse free. In both cases, the ambiguity is easily explained if we recognize two parts to the meaning of open and free, an action on Joan’s part and a possible result of that action, namely the door being open or the mouse being free. On the assumption that each adverb, again and almost, takes as argument a situation, the presence of two situations in the meaning of open and free explains the ambiguity of (17) and (18), as each of these two subparts (or the whole situation versus the result part in some analyses) can serve as argument of the meaning of the adverbs.

Note that this explanation of the ambiguity of (17) and (18) does not per se require that the representation of the meaning of the verbs in (17) and (18) be decomposed into two parts. My explanation was couched in terms of the complexity of the denoted categories of situations, not in terms of the complexity of the representations themselves. But many linguists since the early days of Generative Semantics have taken, off and on, the view that such ambiguities suggest that the representation of the meaning of the verbs in (17) and (18) should be decomposed into component parts, as shown in (19) ((19) is but one way of decomposing the representation of the meaning contributed by open.) The fact that this meaning includes two predicates over which the meaning of again can have scope (or which it can take as arguments) easily explains the ambiguity of (19), as shown in (20).

(19) CAUSE (e’, x, BE-OPEN (e’’, y))
(20) a AGAIN (CAUSE (e’, x, BE-OPEN (e’’, y)))
    b CAUSE (e’, x, AGAIN (BE-OPEN (e’’, y)))
This representational model of the ambiguity of (17) and (18) does not speak directly to the source of the ambiguity represented in (20). The source could be lexical, as in the approach proposed in Dowty (1979). Under that view, the ambiguity lies in the systematic complexity exhibited by the meaning of certain verbal stems, and the scopal potential of adverbs such as again and almost simply attest to the complexity of these lexical meanings. The source could also be syntactic. This is the tack proponents of Generative Semantics took when first discussing this ambiguity. Under that view, the complexity of the meaning of open in sentence (17) comes from the complexity of the syntactic structure associated with formulas like (19). In other words, decomposition amounts to treating the meaning contributed by verbs as molecular rather than atomic (i.e. treating it as composed of recognizable parts) and the original approach to decomposition was that the semantic parts should be associated with distinct syntactic parts. The re-composition of the parts of the decomposed meaning into a single verb meaning was the result of a syntactic operation called predicate raising. This view maintained a one-syntactic-atom one-semantic-atom assumption, but at the cost of multiplying structure. This view was attacked vehemently at the time (see Fodor (1970)), but has seen a resurgence in the 1990s and in the last decade, even to the point that it has become “evident” in some syntactic circles. Consider Ramchand (2008) (see also Borer (2005) for a more articulated, similar approach). Ramechand’s first phase syntax amounts to reifying predicates used since Dowty (1979) into abstract (most often phonologically null) heads that roots merge with. The relevant heads correspond to the very same operators Generative Semantics introduced as null heads, RESult, PROcess, and INITiation. Underlying these more syntactic approaches to decomposition is, implicitly, something like Jackendoff’s (1983) Grammatical Constraint which says that semantic representations that make interface with morphosyntax easier should be preferred.

A second impetus for analyzing the meaning of verbs into component parts was the long-standing desire to find primitives – primitives of thought in philosophical or Artificial Intelligence circles (see Shank (1973)), primitives of meaning in more linguistic circles. The strongest proponent of the analysis of verb meanings (in fact, all meanings) into a set of primitives is Natural Semantic Metalanguage (see Goddard and Wierzbicka (1994) for an overview), which since the early 70s has proposed to decompose all lexical meanings of all languages into a very small set of primitives (see Chapters 12 and 25). Aside from the obvious motivations behind finding primitives of meaning, a less obvious one, which has played a role in both Shank’s and Jackendoff’s (1983) proposals, is that decomposition would make it easier to model inference patterns. I call this motivation for decomposition the Reasoning Constraint. By assuming that the meaning of transitive uses of verbs like open or free can be decomposed as in (21) (where PRED is a variable over state meaning representations), we can posit a single inference rule that accounts for the fact that from knowing that (22) and (23) are true, speakers know that the door was open or that mouse was free from the trap.

(21) \text{CAUSE} (e’, x, \text{PRED} (e’’, y))
(22) Joan opened the door.
(23) Joan freed the mouse from the trap.

A third impetus for analyzing the meaning of verbs into component parts (whether the meanings of verbs are already present in the lexicon as is or are the result of a syntactic operation of predicate raising) comes from differences in what gets expressed in single verb stems versus in dependents of verbs across languages. A simple example from English and French will illustrate the problem.
(24) Bill entered the room.
(25) Bill came into the room.
(26) Bill est entré *(dans) la pièce.
Bill is entered into the room

Aside from possible register differences, sentences (24) and (25) have very similar meanings. But in one case, the fact that the described event is one of change of location that results in Bill being inside a room is encoded by a single verb stem enter whereas the same information is contributed by two words in (25), namely come and into. Since that information is contributed by two words in (25) each contributing to the description of a distinct situation (a change of location and a static location, respectively), there must be two components to the meaning of enter in (24). Note that the argument affects studies of cross-linguistic differences in lexicalization patterns (such as those of Talmy (2000)), but also yet again studies of inferencing. One of the motivations for Conceptual Dependency, Shank’s metalanguage for representing both our knowledge of the world and the content of texts and discourses (Shank 1973) was the need to develop a single interlingual semantic representation that one could define inference patterns over. And this makes sense, as it would seem odd to assume inference patterns depend on language-specific facts such as whether a language has words like enter or not. French sentence (26) adds an interesting twist to the story. The source of enter, French entrer, requires its complement to be a prepositional phrase that is headed by dans. Dans redundantly encodes the spatial configuration of Bill and the room at the end of the event. Without recognizing two components to the meaning of enter and entrer it is hard to explain the similarities and differences between these two cognate verbs.

I illustrate semantic decomposition and its challenges with the currently most prevalent decomposition scheme, the one proposed over the years by Jackendoff. A subpart of this scheme is provided (in a somewhat simplified form) in (21).

(27) a [EVENT] → [Event GO ([THING], [PATH])]
b [EVENT] → [Event CAUSE ([EVENT/THING], [EVENT])]
c [PATH] → [PathTO/FROM/TOWARD/AWAY-FROM/VIA ([THING/PLACE])]
d [STATE] → [State BE ([THING], [PLACE])]

Each of the semantic rules in (27) decomposes conceptual entities belonging to the categories within the square brackets on the left-hand side of the rules into the components on the right-hand side of the rules. So, (27a) says that a conceptual object that is an EVENT can consist of a GO relation between a conceptual object that is a THING and a conceptual object that is a PATH. Similarly, (27b) says that a conceptual object that is an EVENT can consist of a relation between a conceptual object that is either an EVENT or THING and a conceptual object that is an EVENT. Rules (27c–d) receive similar interpretations. Several aspects of this (as well as other) decomposition scheme deserves comment. First, the decomposition scheme defines categories of situations: there are states, there are events of change and there are causal events (because the primitive GO can be understood metaphorically, it is best to think of GO as denoting events of change, be they changes of location or changes of states). Second, the rule in (27b) leads to semantic recursion, as arguments of the relation CAUSE can themselves be events. Third, the “bottom” of conceptual structures (those conceptual objects that can be arguments of relations, but are not themselves relations), i.e. the set of basic predicates are categories of THING and PLACE (which, again, stands for both locations and what would intuitively be states). These last two aspects of (27) are the
source of two of the objections to decomposition, (i) the difficulty of determining when to stop decomposing and (ii) the prediction of more complex root meanings than seem attested.

Consider the decomposition of the meaning of the verb *eat* in Jackendoff (1990).

(28) CAUSE [a\_thing, GO[thing, TO[IN[MOUTH-OF[a]]]]]

Whether this is the right decomposition or not is not what is at issue; rather, the question is that with only THING and PLACE categories as open classes of semantic primitives, decomposition is required and it is difficult to know which decomposition to prefer. Thus, what evidence is there that this decomposition is how speakers understand *eat* rather than as CAUSE(X, INGESTED(Y)) (or even INGEST as in Shank (1973)). Various authors have proposed criteria for deciding among possible decompositions (cf. the Grammatical and Reasoning Constraints above), but there is still no consensus on many aspects of predicate decomposition, although all agree that CAUSE and BECOME (or an equivalent operator encoding change) must be part of any realistic predicate decomposition scheme.

The recursivity that arises out of (27b) has also been criticized. Since the relata of CAUSE are themselves conceptual objects that belong to the category EVENT, they can be decomposed, leading to ever more complex possible meanings. But Carter (1976) points out that there is little if any evidence that the meaning of simple stems can ever involve two CAUSE relations (i.e. CAUSE (CAUSE (X, Y), Z) or CAUSE (X, CAUSE (Y, Z)), and so forth). That is, whereas sentence (29) is grammatical (if complex), there is no word *scooked* in English that would mean something like CAUSE (x, CAUSE (y, COOKED (z))) and this absence does not appear to be a lexical accident, as it would have to be under the recursive decomposition scheme illustrated in (27).

(29) Martha made Bill make his son clean his room.
(30) Marc cooked the stew.

More generally, the difference between the semantic effects of syntactic composition, which freely lead to recursive semantic representations of the kind (CAUSE (x, CAUSE ...)) and the maximum complexity of verb meanings disappears under a scheme such as (27). Note that having CAUSE in one’s decomposition scheme only leads to this issue if one recognizes events in one’s ontology and arguments of CAUSE can be categories of events (see Dowty (1979) for an approach to decomposition that eschews this problem).

4 Are there limits on the complexity of verb meaning?

The apparent systematic absence of embedded CAUSE predicates is part of a larger issue, namely what the limits are on lexical semantic complexity or, put in more general terms, what kinds of constraints on categories of situations can verb roots impose (the third question I listed at the beginning of this chapter). I illustrate this question with a few examples. Consider first the French verbs *chambrer, limoger* and *mander*. The first verb is transitive and means something like “let [red wine] sit in a tepid room so that it slowly warms up to the appropriate temperature for consumption.” The second, also transitive, means something like “to relieve from his post a commanding officer.” The third has two meanings, either “tell something to someone through a letter or message” or “have somebody tell somebody to do something.” First, we should note that whether these verbs violate the two-CAUSE constraint is not certain, as it depends on one’s particular analysis of these lexicographic paraphrases.
The description of the meaning I gave for *chambrer* seems to suggest two causal relations, as the *letting sit in a room* (or *putting in a room*) is typically analyzed as a causal event, and of course there is the causal relation between that event and the wine’s change of temperature. But we can analyze the meaning differently, i.e. *chambrer* may mean that someone acts in such a way that the wine warmed up to room temperature and have the method for achieving this goal be a matter of world knowledge that is not part of the meaning of the verb. Similarly, the definition of *mander* seems to involve a sequence of two causal relations: A cause B to tell C (= cause to know in many analyses) to do D. But we need not analyze *tell* as involving CAUSE. We can, as Shank would assume, have an “MTRANS” predicate that more narrowly, as a primitive, encodes transmission of information. Or we can assume that we need to add to our list of primitives USE to model obligatory instruments, where instruments include possibly human intermediaries carrying out orders, as seems required to model sentences such as (31). If we take this route, then *mander* would “decompose” as USE (x, y_messenger, DO (z, . . .)) where DO is a variable for actions. As we can see, whether root meanings violate the two-CAUSE constraint depends on one’s analysis of what is part of the meaning proper and what is part of additional, typical information, as well as what one countenances as conceptual primitives.

(31) The US liberated Grenada with only 2,000 men.

Second, *chambrer* and *limoger* require the inclusion of rather arbitrary restrictions on the arguments of predicates that are part of the decomposed meaning (something McCawley (1968) already mentioned, citing verbs such as *devein* that can only take shrimps or similar crustaceans as patients): the verb *chambrer* requires the patient be wine (or possibly a few other kinds of nutrients) and *limoger* requires the patient to be a commanding officer (or, at least, a high-ranking official).

A third potential wrinkle for the attempt to limit how complex stem meanings can be is illustrated by the meaning of the Wakashan root √tek that means “reluctant to go out (of harbour etc.) because of the weather” (I thank Emmon Bach, p.c., for this example). We can certainly analyze this meaning as CAUSE (STATE(weather), RELUCTANT (x, GO(x, OUT(HOME)))) (where STATE is a variable over names of states). But the lexicographic paraphrase suggests that the stem denotes a state of mind, not a causal event, i.e. that somebody is reluctant to go out because of the bad weather rather than the state of the weather causing somebody to be reluctant to go out. To express through decomposition the lexicographic paraphrase, conjunction is required (e.g. RELUCTANT (e, x, GO (e’, x, OUT(HOME))) AND CAUSE (BAD(e’”, WEATHER), e)). But introducing conjunctions in the lexical meaning of roots is opening Pandora’s box, as it is hard to see how to limit arbitrary conjunctions.

Until now I have discussed limits on the complexity of situation categories encoded in mono-morphemic stems in terms of how many sub-events can be necessary parts of the situation categories associated with the meaning of verbs. But other limits on event complexity have received attention as well. Rappaport and Levin (2010) have argued that verb meanings can restrict the manner in which a result is obtained or the result that is obtained, but not both. So, there are verbs like *jog* and *wipe* that constrain the nature of the agent’s activity and there are verbs like *shatter* or *dim* that constrain the nature of the result of the agent’s activity, but no words like *bratter* that would mean something like *shatter using a hammer-like object and apply it forcefully*. That most verb stems are specific about either the manner in which an activity is performed or its result is indeed true. But there are reasons to doubt it
is an absolute requirement on verb meaning. As Beavers and Koontz-Garboden (2012) have noted, verbs of manner of killing (crucify, guillotine, electrocute) seem to constitute systematic exceptions as they certainly put constraints on the result (death or a state that will lead to death) as well as constraints on how this result is induced.

The decomposition of verb meanings into a small set of primitive operators and a base (state or activity) predicate suggests verb meanings within and across languages could vary in their lists of base predicate constants, meaning complexity (is there a cause, is there an instrument . . . ?), and in properties of the participants in the events (selectional restrictions). Consider our example of limoger. What is specific to the meaning of that verb is the final state (not be in a commanding post) and the kind of entity undergoing that change (higher officer). But some variation in the meaning of verb stems across languages goes beyond this model of semantic variation. Mandarin sentences (32) and (33) illustrate the phenomenon (see Bar-El et al. (2005) for similar data from Salish, Paramasivam (1977) for data on Tamil, and Koenig and Chief (2008) for data on Mandarin, as well as reported data from Hindi and Thai). As the English translations of these sentences suggest, we would expect the relevant change to be reached at the end of the event. In Parsons’ (1990) terms, we would expect the event to have culminated. This is why the phenomenon illustrated in (32) and (33) has come to be referred to as non-culminating accomplishments: contradicting the occurrence of the change (the event’s culmination) is infelicitous in English, but not in these other languages. Note that the source of the difference does not seem to lie in differences in the meaning of the direct object or aspect marking. Even when the proto-patient argument is bounded (quantized) and the aspect is perfective (or perfect), the difference in entailments remains: one can still deny the accomplishment culminated, as shown in (33).

(32) Xu Mei he Sun Mazi ba Lao Luo sha le mei sha-si
Xu Mei and Sun Mazi BA Lao Luo kill PERF not kill-die
“Xu Mei and Sun Mazi killed Lao Luo but didn’t make him die. (lit.)” (Google)

(33) wo (. . .) chi le liang chuan dakao, dan mei chi-wan
I (. . .) eat PERF two CL kabob, but not eat-finish
“I ate two kabobs, but didn’t finish eating them. (lit.)” (Google)

Various models of the phenomenon have been proposed (see Koenig and Chief (2008) for an explanation that relies on a scalar analysis of change), but what is interesting here is that whatever the explanation is, it is not easily accounted for in a model of the meaning of verbs of the kind proposed in many models of decomposition, as these models limit the range of meaning differences to kinds of states or activities and properties of arguments of predicates and functors. (One possibility worth exploring would be to distinguish between various kinds of BECOME and have the BECOME operator relevant to languages in which non-culminating accomplishments are pervasive have a slightly different meaning than the BECOME operator in English.)

5 Deriving categories of situations

In sections 2 and 3 I discussed two classifications of situation categories, Vendler’s (often called Aktionsart classes) and the categories that decomposition schemes induce. As I mentioned, the two categorizations are not unrelated and Dowty (1979) can be seen as a way of combining the two perspectives, i.e. as a lexical decomposition scheme whose goal is to model Vendler-style classes. But these two perspectives have different goals, as mentioned above, and much of the research on Vendler-style classes has focused on how to compose
meanings to derive situation descriptions that belong to these classes rather than decompose the meaning of verbs. The reason it is difficult to explain why a particular sentence type belongs to one Vendler-style class or another is that various parts of the sentence can contribute to assigning the meaning of the sentence to one class or another. Not only does the verb play a role, but so do properties of its arguments, as do aspect markers.

(34) a Mary ate a pound of cheese in an hour.
    b Mary ate cheese for an hour.
    c %Mary was eating a pound of cheese for an hour.

(35) a Mary ran for 15 minutes.
    b Mary ran a mile in 15 minutes.
    c %Mary was running a mile for 15 minutes.

(36) John carried his brother for 15 minutes.

The contrast between (34a) and (34b) shows that the denotation of the direct object makes a difference in the Vendler-style class of the sentence (from now on, we will label the argument that the direct object corresponds to, the proto-patient argument, borrowing liberally from Dowty (1991)). Basically, if the proto-patient is bounded (quantized in Krifka’s (1989) terminology) and the verb is “the right kind of verb” (see below for more on this issue), the sentence describes an accomplishment, but if the proto-patient is not bounded (not quantized), the sentence describes an activity. The contrast between (35a) and (35b) can be described along the same lines if we assume that when the amount of ground covered in an act of running is left unexpressed, it is per force unbounded. Of course, the boundedness of the proto-patient is not enough. You need to start with the right kind of verb, the crucial insight of Vendler’s original proposal. Thus, events of carrying will never be accomplishments, even when the proto-patient is bounded, as sentence (36) shows. But, even if the proto-patient is bounded and we have “the right kind of verb,” the sentence can still describe an activity if the aspect marker selects an unbounded portion of the overall event, as the progressive does in (34c) and (35c) (%indicates speaker variation: some speakers find these sentences hard to contextualize).

A lot of ink has been spilled in the last forty years (since at least Verkuyl (1972); see Rothstein (2004) for a recent approach) on how to best model the respective effects of verb meaning, proto-patient (as well as other argument) properties, and aspect on the assignment of a sentence’s meaning to a Vendler-style class. Following the work of Hay et al. (1999), it is common to distinguish between non-scalar changes (what underlies activities) and scalar changes (what underlies achievements and accomplishments). Telic events are analyzed as bounded (quantized) scalar changes. Sentences (37)–(42) illustrate what is meant by scalar changes.

(37) Marc shortened his pants.
(38) Sue sharpened her knives (in an hour/for an hour).
(39) Marc cooked the fish (in an hour/for an hour).
(40) Martha went home.
(41) Marc died.
(42) Jack noticed the car.

Sentences (37)–(39) describe changes in the properties of the pants, the knives, and the fish respectively. The changes undergone by the pants and knives in (37) and (38) are changes...
in degree on a relevant dimension (length, sharpness) (see Kennedy and Levin (2008)). The scalar nature of the change described in (37) and (38) is easily explained by the scalarity of the verb’s adjectival base, *short* and *sharp*. But sentence (39) shows that the presence of an adjectival base is not needed for a verb to describe a change in degree (of rawness in the case of *cook*). Sentence (40) also describes a scalar change, as long as we analyze the path Martha took to go home as a scale (where locations on the path serve as the degrees ordered by the direction of the movement), something relatively plausible. The scales involved in (37)–(40) are complex in that they consist of more than two degrees. But this is not the case for sentences (41) and (42). These sentences can be analyzed as describing scalar changes, but only provided we allow scales to be binary, i.e. to involve only two degrees (being alive/not alive for sentence (41); being aware/not aware for (42)), as Beavers (2008) suggests. Finally, descriptions of complex scalar changes need not be bounded, as the ability of both *for* and *in* phrases to combine with the verb and its dependents in (38) and (39) shows. The fact that one can sharpen a knife or cook fish indefinitely explains the possibility of *for* phrases (which characteristically pair with activities: see the discussion below), but the fact that there is also a contextually salient standard or norm for both kinds of situations explains the possibility of *in* phrases (which characteristically pair with accomplishments).

As I just mentioned, in contrast to accomplishments and achievements, activities do not involve a change that can be analyzed as scalar (i.e. as a change of degree of a property on a scale). Sentence (43), in its most salient interpretation, describes a sequence of minimal changes of location, a sequence of steps, say. But, there is no necessary order in this sequence of changes. Sam could have walked back and forth. This is why sentence (43) does not entail that there is change in location on a path (which, as mentioned above, can be analyzed as a scale, i.e. as an ordered set of degrees, the ordered set of locations on the (directed) path).

(43) Sam walked.

Although the notion of non-scalar change appropriately characterizes many activities (particularly, manner-of-motion events), it is unclear whether all activities involve change. In some cases, the change, if present at all, would seem rather abstract. Consider verbs like *work* predicated of guards standing still outside Buckingham palace. What changes make up their work? Hard to say. The guards’ work certainly involves internal activities (e.g., a heightened level of responsiveness), but whether those are continuous changes, as is the case for manner-of-motion verbs like *run*, is unclear. Worse, there seems to be no change at all involved in some basic human activities, such as holding a cup in your hand. This description does not pass classical tests of stativity (see Lakoff (1966); for example, the progressive is required for a non-habitual interpretation in the present for all these activities). But this activity only requires an expense of energy on the part of the person holding a cup. This is confirmed by the fact that for these activities, the subinterval property is true “all the way down.” So, whereas a subevent of running is only still running as long as it is long enough, no matter how small the event or interval of time, you still hold the cup.

As we just have just seen, *in* and *for* temporal phrases are sensitive to the boundedness of event descriptions. But why? I follow Moltmann (1991) (expanding on Dowty (1979)) and analyze *for* phrases as quantifying over parts (either parts of time intervals or parts of events). So, if the *for*-version of a sentence like (44) is true, it entails that John ran for any relevant subinterval of ten minutes. ((45) shows that the domain of quantification does not necessarily include all intervals of time, but only the relevant ones given the event description: in this case, intervals of time that are a day long.)
(44) John ran for 10 minutes/in ten minutes
(45) My dad shaved a pipe twice a day for 30 years
(46) John ran a mile %for 10 minutes/in 10 minutes

Following Dowty (1979), I analyze in temporal phrases (often called frame adverbials) as (uniquely) existentially quantifying over the event described by the verb constellation. Thus, sentence (46) says that there is a unique interval of time included in ten minutes during which the event described by John ran a mile unfolded.

Given these meanings for in and for phrases, we can easily explain their sensitivity to whether the described event is bounded. If an event description requires the described event to include an event’s boundaries, then the same description will not be true of a proper subpart of that event. If the description requires the event to be one of John running ten miles, that description will not be true of a smaller running event (where less than ten miles were run). Since for phrases require the description they have scope over to be true of all (relevant) subparts of the event, a for phrase will be incompatible with such an event description, except if the event description is understood as describing the process of running a mile (the interpretation required by the % in sentence (46)). Conversely, for an event as described by the verb and its dependents to be included in an interval of time of 10 minutes, there must be a unique interval lasting at most 10 minutes during which the event described by the verb constellation unfolded. So, sentence (44) is incompatible with in 10 minutes because John running is true of many intervals of time since it is an homogenous event.

6 Which event properties matter to syntax?

The last question mentioned in the introductory paragraph pertains to potential limits on the range of distinctions among categories of situations that morphosyntactic processes are sensitive to. Pinker (1989) and Grimshaw (2005) suggest that there are strict a priori limitations in the aspects of event semantics morphosyntax cares about. Glossing over differences here, these authors view the categorization of event-types of the kind I described as part of linguistic semantics as distinct from conceptual structure or world knowledge (see also Van Valin and LaPolla (1997)). The idea here is that out of all potential categorizations of events, only some are relevant to the interface between syntax and semantics. It is those that form the basis of decomposition (which is only part of the lexical semantics of verbs). They then point out that syntactic constructions, morphological derivation, and other closed class expressions have a limited range of meanings they can contribute and those are similar to the kinds of meaning that appear in predicate decomposition (see Pinker (1989); Talmy (2000)). The explanation for this “fact” is then sought in a special semantic system that differs from world knowledge.

There is no doubt that grammars seem sensitive to only a small subset of properties of situation categories and that language use, in contrast, is sensitive to many more properties. Thus, when it comes to predicting the realization of arguments, grammars are sensitive almost exclusively to entailed properties of lexical items. So, what matters for determining the subject of a transitive verb like sweeten is that its proto-agent argument causes a change of state. Only properties entailed of the argument position seem relevant (see Dowty (1991) for details and some circumscribed exceptions). But, typical properties of fillers of argument position are very relevant to sentence processing, a point made forcefully by psycholinguists over the last twenty years. But while it may be tempting to reify the difference in the kinds of event properties relevant to grammar and processing
and therefore assume two distinct cognitive subsystems responsible for those two distinct classes of situation properties, there are reasons for caution. First, even if limited, we do not yet know the exact limits of the situation properties relevant to grammar. The specification of the “subject” and “object” of kin verbs, for example, is sensitive to the property “being generationally older” and, possibly, sometimes, being older (see Evans (2000)). Second, the notion of closed class is itself difficult to maintain. Are prepositions a closed class as Talmy claims? Maybe, but what evidence do we have except that the meaning of prepositions is of the kind we associate with closed class expressions? And, as we know, adjectives can be closed class in some languages too (see Dixon (1982)). Third, and more importantly, the fact that there is a subsystem of meanings for closed class expressions does not necessarily mean that grammar should be sensitive only to those aspects of meaning unless one stipulates, like Pinker or Grimshaw, that only those event properties are “visible” to grammatical constraints. This is a strong claim whose truth would depend on the existence of a built-in architectural constraint, something we have little evidence for as of now. Another possibility explored in Koenig et al. (2015) is that the reason for the difference between the range of event properties relevant to grammar and processing has to do with the differences in the task the two cognitive systems are engaged in. In other words, the difference would arise out of boundary conditions (what the point of processing and grammar is) rather than built-in architectural differences.

Further reading


References


Related topics
Chapter 12, Lexical decomposition; Chapter 19, Lexical and grammatical aspect; Chapter 23, Participant roles