Introduction to Linguistics Reading:

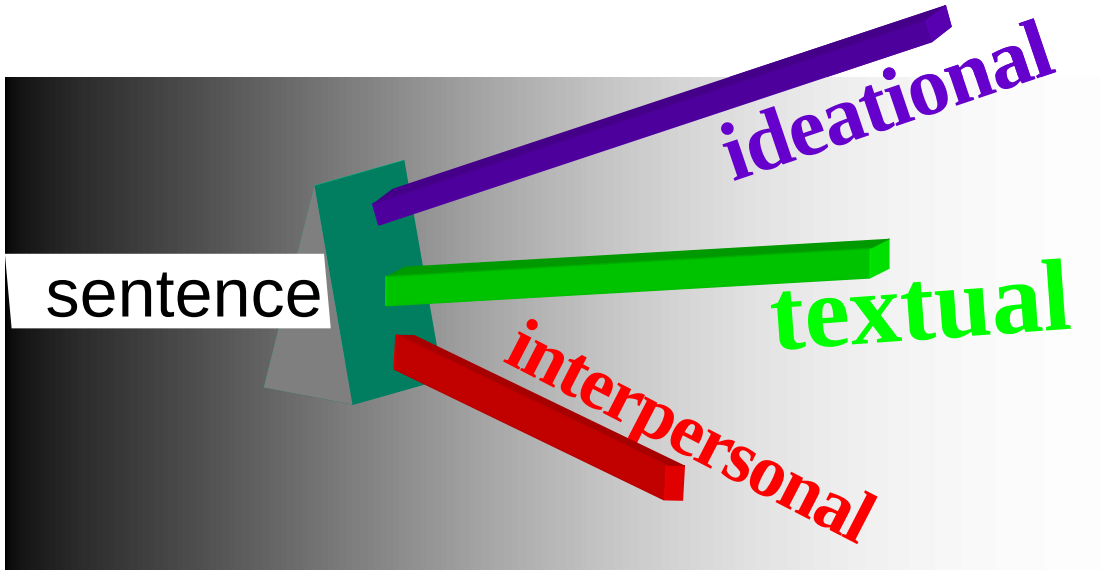
Bateman (2004, Chapters 8 and 9)

8 The meanings of ‘linguistic patterns’: semantics

WHAT WE ARE DOING THIS CHAPTER.

We have now seen a variety of linguistic patterns of varying degrees of complexity. We have also seen some of the maps/theories that have been developed in order to provide frameworks for these patterns: in particular, functional vs. formal and maximal vs. minimal bracketing in grammatical structure.

In this chapter we look more closely at the relation between kinds of patterns and kinds of meanings. Here again we will find that there is considerable systematicity that we can usefully rely upon when thinking about language. We will see that particular types of patterns in fact express particular kinds of meanings. We will see that it is primarily this feature that allows language and language use to become as sophisticated as it is. Language really is essentially made up of patterns of patterns of patterns and it is this successive build up of ever more abstract ‘structures’ that provides something capable of carrying the meanings that make up texts.



It is now time to bring our introduction to the basic stuff of language—and its structuring into larger-scale patterns—into a much clearer relationship with meaning. We have seen that grammatical structure and the interpretation of grammatical structure are intimately tied together. When we have found ambiguous sentences, we can also find alternatives in the grammatical structure. Differing interpretations of a sentence then generally go along with different structures. It is only because we perceive the structure differently that differing meanings are drawn from it.

Structure as such is then very powerful, and it is absolutely necessary for language to exist—particular aspects of structure that we have seen so far can be called **design features** of language; if a system, a *semiotic* system such as language, is to do its job, then it will need something like structure present. But structure is still only a tool that serves a purpose. And tools, especially long-lived tools like those that have evolved for language and language use, take on special features and attributes that increases their suitability for the tasks demanded of them. This is, in fact, the broadest and most general statement of a *functional* approach—i.e., that language forms have evolved to perform particular functions. Describing linguistic functions can then tell us much about the kinds of linguistic forms that languages use. The particular kinds of structure and the particular tasks they take on within language is then what gives us the organising subject of this chapter.

The approaches to syntactic structures that we have seen so far have been drawn from a variety of maps concerned with the task of building phrases and clauses. We have seen distinctions between formal and functional 'maps', and within form we have seen the different emphases brought by rank-based accounts and immediate-constituency based accounts. All of these views are in fact concerned with a particular level, or scale, of structure. But structures also occur at many other places in the linguistic system: both 'below' the clause, where for example they organise sequences of sounds into larger combined units (such as words), and 'above' the clause, where they provide texts with

additional organisation beyond the mere sequentiality of the sentences or utterances out of which they are built. It is then very useful to distinguish more carefully and exactly between these kinds of structures so as to examine their particular properties more closely. We will see that an understanding of structure and kinds of structures is a fundamental aspect of thinking usefully about language within linguistics overall.

Some kinds of structures are very strict, others are more flexible or 'contingent'—i.e., depending on particular details of how they unfold, or develop, in time. The strictness of the structures usually goes together with the 'size' of the linguistic units considered. When we look at 'smaller' units such as sentences, we can say that a sequence of words such as:

running train late the is

is a sufficiently gross violation of the structures of English grammar that it is not possible—it is *structurally not English*. It is in some serious and fundamental way deficient and will not, under normal circumstances (i.e., excluding speech errors, brain damage, language learning situations and the like) occur. This tighter notion of structure will give us a good place to begin below.

But when we turn to 'larger' untis such as texts such a **categorial** two-way decision of possible/impossible is problematic. For larger units it is very unusual for structures to be so binding that the unit can be rejected as 'impossible' on purely structural grounds. As we saw in the examples of conversational interaction in Chapter 4 (Section 4.3) before and will return to later in the course, interaction consists of a very particular kind of 'structure': that of adjacency pairs and interactional sequences. In this 'domain' of structure, there is no sense in which we could say that an answer *must* follow a question in a Question-Answer adjacency pair in order for the interaction to be 'legal' or 'well-formed' or an example of an English interaction. There is no sense, that is, in which we can say that a dialogue extract such as:

A: Are you going to the party tonight?
B: Nice weather we're having.

is ‘not English’ because it appears to violate the Question-Answer pattern.

The term used in conversation analysis for such ‘violations’ of structure is to say that the second item of the pair is *noticeably absent*. That is, might have been predicted to occur but, in fact, does not. We cannot say that such a sequence is ‘wrong’ or impossible, but we *can* say that it will have particular, specifiable and systemic consequences. The hearer is explicitly invited to make certain inferences. The notion of structure is then just as important at these larger scale instances of language as it is at the smaller-scale of grammar. If structure were *not* present then we would not be able to recognise the cases where a turn *is* noticeably absent. Clearly, however, the use that we make of structure at this level or scale is different from that within sentences.

Because it is the smaller linguistic units, as we have seen, that often have the strictest structural properties, it is here again we will begin our discussion of the connection between forms of meaning and forms of structure. The richest kinds of structure that we can find are those that have developed for, and are employed by, grammar. and so it is here we find most of the basic components that we need to talk about structure more generally.

Grammatical structures are there so that language users have a flexible means of expressing their meanings. The basic properties of structure—particularly recursion—always let syntax expand as necessary to carry the meanings required of it. If what we want to say fits into a simple sentence fine; but when we need to pick out carefully some particular object (like the person that we met last Friday at the second party in town that we went to after midnight), grammar and the syntax of relative clauses and modification will get us there.

But the demands made on syntax—the ‘loads’ placed on it if we take as a metaphor the description of physical structures illustrated in the quotation below—can push the structures we see in real texts into a range of shapes that stretch our abilities to recognise them to their limits. You will already have encountered many such problematic cases in attempting to apply phrase structure to naturally occurring

Structure is “any assemblage of materials which is intended to sustain loads.” J. E. Gordan, *Structures: or why things don’t fall down.* Penguin. 1978. p17.

sentences. And in fact this then becomes an important methodological decision within linguistics—one of those choices between maps and ‘cartographic’ principles that distinguishes one approach to linguistics from another. Some schools of linguistics attempt to follow the different shapes of syntactic trees no matter how far they are pushed around by meaning, other schools of linguistics employ a range of techniques that do not always follow the contortions of syntax. The first approach gives us increasingly complicated phrase structures; the second gives us simpler phrase structures but more complex components of the model elsewhere.

This can usefully be seen as a continuum of approaches—ranging from the strictly formal to the strictly functional. Both extremes have severe problems as maps of language: we need both and a lot of the discussion between different approaches revolves around just how much information to put where. The less functional information that is available in a map, the more complex a formal structure needs to become; the less formal information that is available in a map, the more difficult it becomes to explain the fine details of syntax and grammar.

We have already seen this concretely in the maps we have examined in previous chapters.

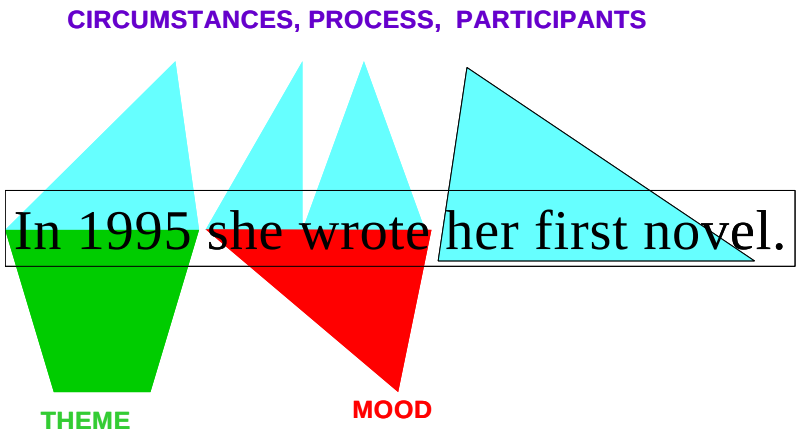
Understanding syntax is an important prerequisite for uncovering how language is doing its job of carrying meanings. But it is also very useful to combine this with other characterisations describing language. In Chapter 2, for example, we saw the distinct kinds of meanings that we can pick apart in the sentences of texts: the ideational, interpersonal and textual meanings. These different kinds of meanings all bring differing kinds of ‘communicative pressure’ to bear on the basic structural ‘stuff’ of sentences. We pick this relationship apart more below.

We also drew attention in Chapter 2 to the close relationship that can be seen between these distinct kinds of meaning and distinct aspects of social situations—introducing the terms of field, mode and tenor. One way of seeing this

connection that we will focus on here is again in terms of patterns. When particular structures are selected repeatedly, or within particular limited degrees of variation, then readers and hearers can attribute meaning to this. And so patterns of meaning in the grammar can be combined into larger patterns of patterns that indicate social and contextual meanings. It is only because the relationships are so systematic and relatively stable that language users can rely on their language making sense to others sharing (to greater or lesser degrees) their social situation(s).

8.1 Different types of structure for different types of meaning

We have raised the possibility of a connection between the kinds of meanings raised by the three *metafunctions* and their expression in grammatical structures. To recap, we should recall that *ideational* meaning is to do with representing the world, *interpersonal* meaning is to do with enacting and signalling social relationships, and *textual* meanings are concerned with building our utterances into larger-scale textual units that hang together in order to achieve particular communicative purposes.



Although all three of these kinds of meanings are regularly examined in different kinds of linguistics, it is rare to find them all given equal treatment, especially in introductions. These is why most introductions that you may come across focus almost exclusively on one or two of them and seldom relate them to one another. We will try to give the three metafunctions a more equal treatment: An alternative approach that is often seen and which you will encounter in the readings chooses instead to place the textual and interpersonal metafunctions 'outside' 'core' linguistics in an area called **pragmatics**. This naturally influences both the kinds of questions that you can ask and the kinds of answers that you get. For the perspective taken in this introduction,

it is seen as particularly limiting because our concern is to engage with *texts* rather than isolated utterances or sounds. We try to present an integrative view of the areas of linguistics which brings these aspects together rather than leaving them within different components—but, as said, you will encounter all of these possibilities in your readings: an indication of the correspon-dences between the types of meaning talked about with 'metafunctions' and some other components of linguistics is shown to the left.

Ideational:	logic and phrase structure grammar
Interpersonal:	Interaction and conversation analysis
Textual:	text linguistics

The different kinds of meaning are significant, though, not only for describing meaning, but *also* for describing linguistic form—this is because the different types of meaning prefer to be expressed in different kinds of linguistic structures. We saw indications of this above whenever we, for example, used our expectations about clause functions to look for particular constituents in clauses we were analysing. Knowing about the different kinds of meaning can then help us further when we need to understand more generally what parts of sentences and texts are serving what purposes. The different kinds of meanings in fact *require* different forms of expression: that is, their inherent properties do not let them all be expressed in the same ways.

A suggestive metaphor might be trying to build an igloo with square bricks—naturally the fact that an igloo is typically meant to be round will bring certain 'pressures' to bear on the appropriate forms of the materials that you use to construct it. And similarly, if building a rectangular-shaped house, specially rounded bricks (or blocks of ice) may not be the best choice! Form can very usefully follow function.

The three kinds of meaning—textual, interpersonal and ideational—regularly go together with three different kinds of linguistic form or structuring—*pulse*, *prosody* and *constituency*. We introduce each of these in turn, starting with constituency since this is the one that has received the most attention in linguistics generally and that you have seen with phrase structure. This is the area which has seen

the most significant advances in the last 100 years—the other areas of meaning are all relatively new and, although they are essential to understand how texts work, for many linguists they still seem experimental or 'non-core'. Bringing these aspects of form and meaning into the picture is part of the essential link between linguistic form and social interpretation that makes a socially-oriented linguistics possible.

8.1.1 Ideational meaning

Ideational meaning is the kind of meaning expressed in our division of texts into Processes, Participants and Circumstances—and this very division is much more readily talked about in terms of the 'building blocks' offered by syntactic constituents. This is just the kind of division that ideational meanings make, dividing the world up into doers and actions, qualities and states, and it is the role of this kind of meaning to impose some regularity on the fluid world around us. For this reason, the kind of linguistic structure that is most relevant for ideational meaning is **constituency** structure.

Because of this, it is often relatively straightforward to find the portions of a syntactic tree that correspond to the ideational elements in a sentence. This makes it easier to avoid mixing Participants, Circumstances and Processes together in loose chains that would hide the real interrelationships between them. Consider again the following sentence:

A fast car with twin cams sped by the children on the grassy lane

This sentence has three prepositional phrases in it and so offers plenty of possibilities for ambiguities in structure and interpretation as we saw previously. It also invites a number of 'mis-analyses' that would in fact not be accurate statements of the structure of the sentence. One of these mis-analyses we have discussed above: that is, it is not possible to link the 'with twin cams' to the verb phrase; it must be a part of the initial noun phrase. Another is more subtle: that is the role of the word 'by'—a possible consideration is whether this is to be linked to the verb or

not. This latter possibility we can see by analogy with sentences such as:

Yesterday he called up his mother.

The mouse ate up the cheese.

The 'up' in both of these sentences is not the simple preposition of a prepositional phrase that we have seen in our syntactic rules so far; they are instead parts of **phrasal verbs**. A phrasal verb is made up of more than a single word and often includes an additional word looking like a preposition, which we can call a **particle**. This is also another example of how we cannot consider sentences as simple strings of words; the structure of sentences involving phrasal verbs is very different to that of sentences without them. And, as a consequence, these structures allow their words to be moved around very differently. It is normally possible, as we have seen and will see again below, to move a prepositional phrase that expresses a Circumstance to the beginning of a sentence in order to become the Theme. Attempting this trick with these two sentences produces highly deviant sentences however:[1]

*Up his mother he called yesterday.

*Up the cheese the mouse ate.

This is an indication that the underlying structure is not of the simple kinds we have seen above. Applying our tests probes for identifying constituents and dependencies between constituents also leads to some curious results. For example, conjunction should make us doubt whether the constituent that we just moved to the front is, in fact, a constituent at all.

*The mouse ate up the cheese and up the bread.

[1] Remember that linguists indicate that a sentence or other grammatical unit is not acceptable by marking it with a star at the beginning. Sentences that are not absolutely unacceptable but are instead somewhat dubious are marked with question marks. Note also that this clearly shows that the expression "to sleep in a bed" does *not* involve a phrasal verb: "in this bed he slept yesterday" is a perfectly well-formed sentence, if rather limited in the contexts in which it could appear.

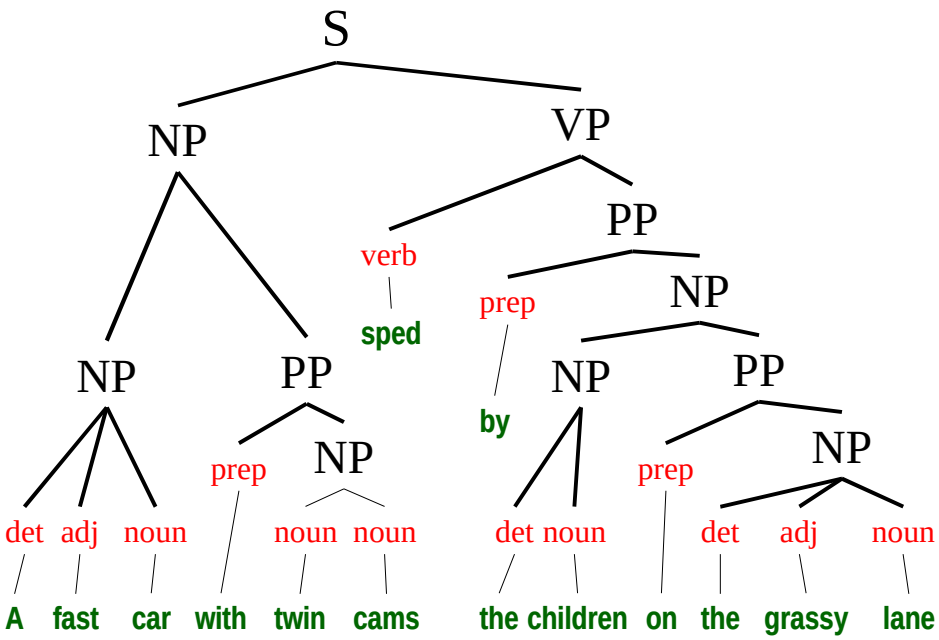
Returning to our car with twin cams sentence, we can now ask again about the word 'by'. Can we move it to the Theme position? Can we combine it with another similar phrase?

- By the children a fast car with twin cams sped on the grassy lane.
- A fast car with twin cams sped by the children and by the tourists on the grassy lane.

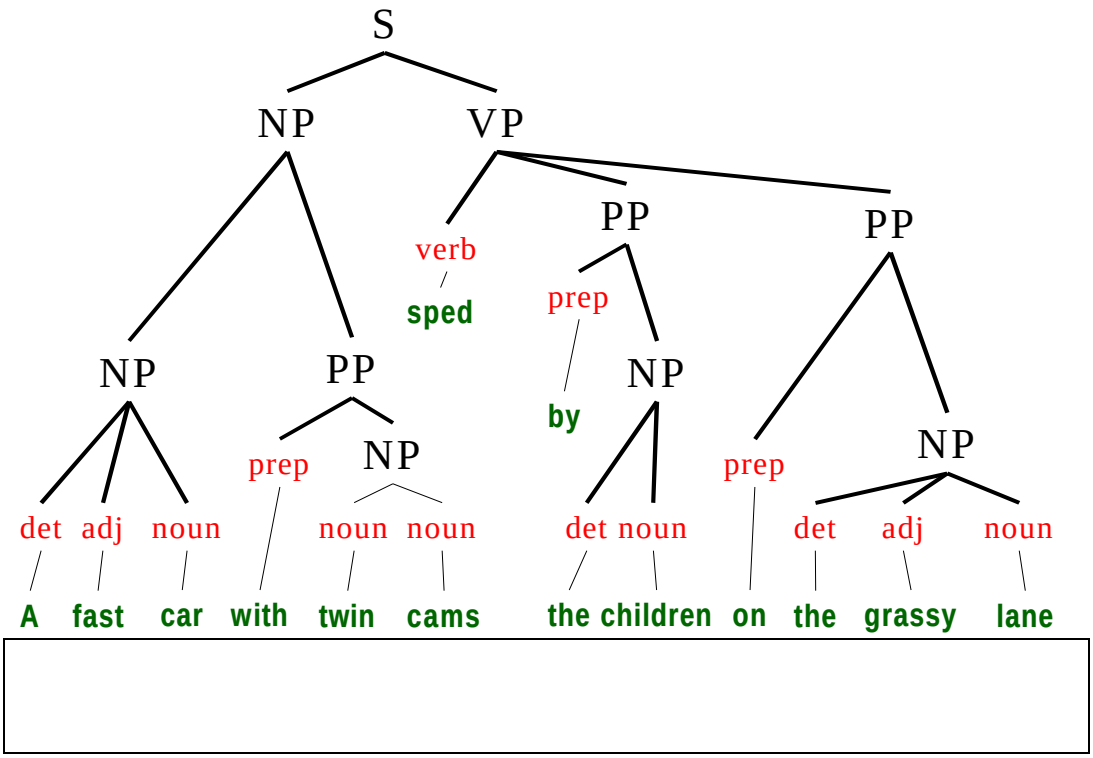
These are both acceptable sentences and so we can conclude with some confidence that the 'by' is not associated with the verb but is a normal preposition associated with the children.

There are then still two possible interpretations of our sentence. Each of these has its own tree structure, which can be contrasted as follows. In the first tree, it is the children who are on the grassy lane, since the PP 'on the grassy lane' is part of the NP 'the children on the grassy lane'

A fast car with twin cams sped by the children on the grassy lane



(A fast car with twin cams) sped (by the children)(on the grassy lane)

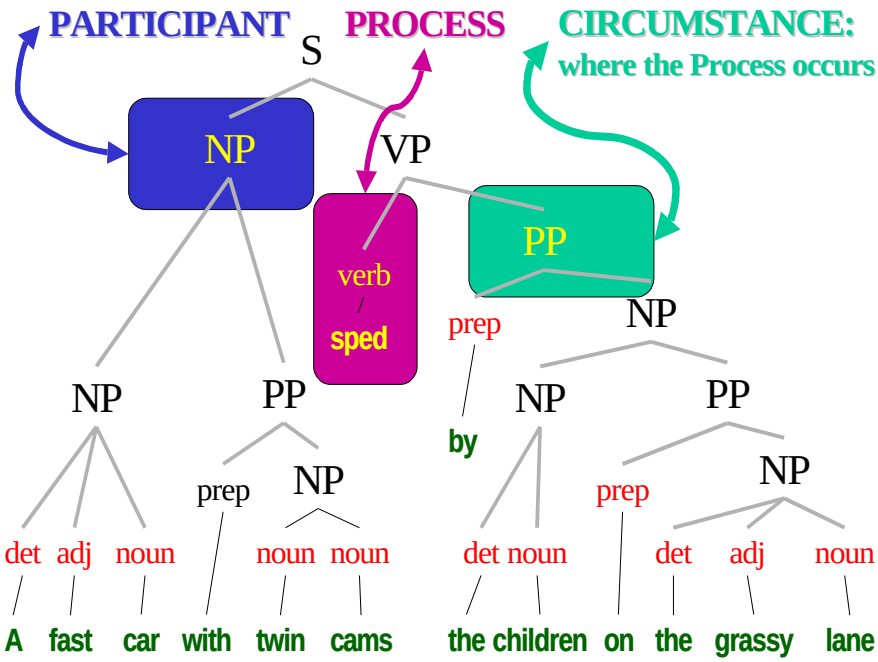


In this second tree, it is the car that is speeding on the grassy lane, since the PP 'on the grassy lane' is now part of the VP describing the speeding. Both readings are possible for this sentence and deciding which situation applies—or disambiguating the sentence—must be done based on other knowledge, for example on knowledge about the situation or common-sense knowledge about how the world generally is.

In both cases, however, we can use the trees for something more than just showing the groupings into phrases. As suggested now in our discussion a number of times, the tree also gives us a very good indication of the phrases that serve particular ideational functions—i.e., the Processes, Participants and Circumstances. This should be expected: as we have noted, the syntactic structure is not arbitrary—its function is partly to make sure that we can find the meanings encoded in the sentence.

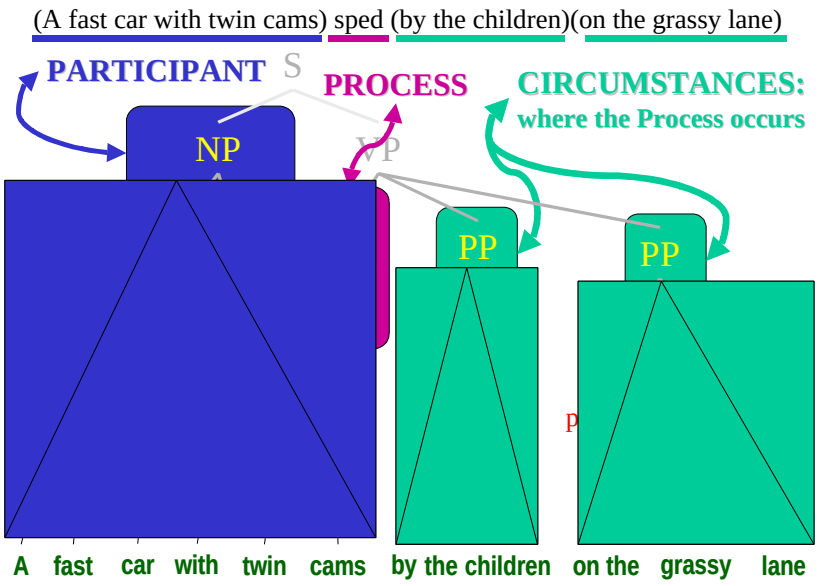
In general, the Process is to be found as the first child of the VP node: which is in this example the verb; the Participants are generally to be found as the first child of the entire sentence (the S node) and the first NP node following the

verb in the VP; and remaining PPs in the VP are Circumstances.



This is shown graphically on the left. Since we, as speakers of English, know how the syntactic trees are organised, we also know where in those trees the particular meaningful elements are distributed. Recognising the structure thus helps us with the task of knowing what a sentence can mean. In the example offered by one of the above structural trees, then, we can see as expected that the first NP—"a fast car with twin cams"—is a Participant and, in fact, is the only Participant. There is no NP following the verb in the VP, we come immediately to a PP, which is then the one and only Circumstance of the sentence.

If, however, we take the other structural possibility—shown graphically below right, then we find that there are now two PP nodes following the verb in the VP, and there are therefore two Circumstances: both saying something about where the speeding occurs—the first gives a relative position, the speeding was past the chi-dren, the second gives an absolute position, the speeding was on the grassy lane. We will see, when

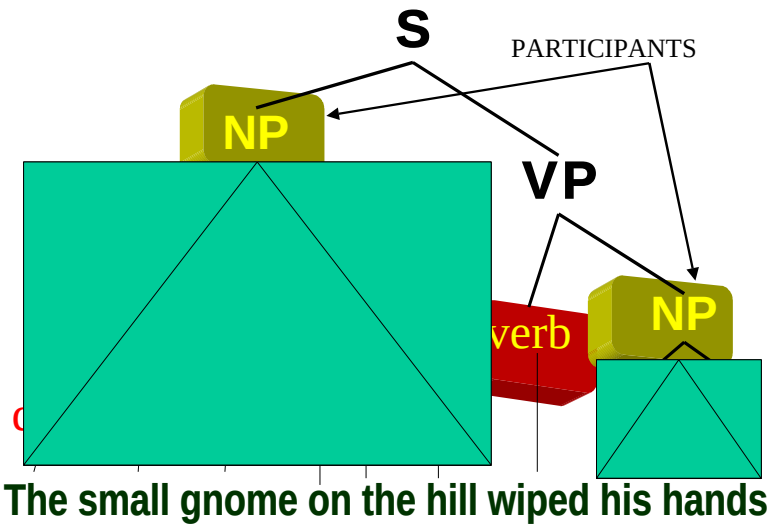


we have discussed both the interpersonal and textual possibilities, that we can also argue for another distribution of information for these sentences concerning the role that the children play; but for the moment the analysis given is one possible interpretation that serves to make it clear that structure and meaning are indivisible.

This then also allows us to reject *impossible* interpretations. The box picture of a sentence structure shown below is analogous to several that we have seen and corresponds directly to our example sentence: 'The small gnome on the hill wiped his hands'.

The gnome	*in the garden*	*is sad*
Participant	Circumstance	Process

The structural tree for this sentence is as follows. .



We can see from this structure that there is *no possibility* of finding a Circumstance role for the PP 'on the hill'—it is quite simply in the wrong place in the tree to be so interpretable: it is hidden in the 'shadow' of the NP that functions as the first Participant. Knowing the structure can, therefore, indicate very clearly what the possibilities for functional interpretation are.

8.1.2 Interpersonal meaning

The interpersonal meanings that we introduced in Chapter 2 were also described loosely as being associated with particular positions in the sentence. Recall that the main functional elements carrying the interpersonal meanings that we examined were the **Mood** element consisting of Subject, Finite and indications of polarity (yes/no) and modality (should, could, would, and so on). We saw that the Subject was often somewhere near the beginning of its clause and the Finite part of the verbal information followed this. But again, this was a bit too simple. Now we can be much more precise because we can rely on our newly introduced notions of structure to pinpoint these positions more accurately.

In addition, although the view of interpersonal meaning that we saw in before concentrated on the Mood element of a sentence, we can also look at the other elements in the sentence—the elements of what is called the **Residue**. Here also there are elements which it is useful to describe interpersonally because they are then viewed *in contrast* to the decisions taken in the Mood element. This is where a range of different grammatical 'Objects' occur—there are called, for example, Direct Object, Indirect Object and 'Oblique' Objects.

An example of a full interpersonal structure for a clause is shown in the following box diagram:

John	*gave*	*Mary*	*the book*	*in the park*
Subject	Finite	Indirect Object	Direct Object	Oblique Object
Mood		Residue		

Another way of describing the Objects, which makes their interpersonal function clearer in English, is to describe them as **Complements**. Complements can be understood as being 'complementary' to Subjects: they are constituents that *could*

have been straightforwardly selected as Subjects if the text demanded it: this gives us the passive sentences:[2]

Mary was given the book by John in the park.

The book was given Mary by John in the park.

The Oblique Object is not so willing to be made into a Subject (although we will see some cases below where it can be managed in English):

* The park was given by John Mary the book in.

For this reason, the two kinds of interpersonal constituent are distinguished from one another. There is also a feeling that the complements are more central, more necessary, for a meaningful sentence than the remaining constituents: the Oblique Objects are therefore also called **Adjuncts—**a term indicating that they are merely added, or are additional, to the main information.

Then there is one final interpersonal element that needs to be distinguished, and that is the **Predicate.** This is necessary because in English the verbal information is often spread over several words: as with the complicated tensed expression:

John *has been going to give* Mary the book for ages.

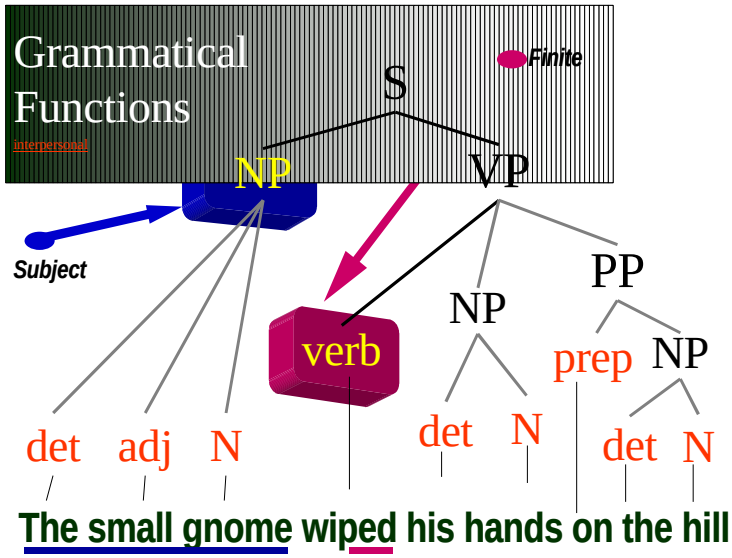
The Finite element here is only the portion of the verb that has the first bit of the tense information and which agrees with the Subject: i.e., the 'has'. The rest of the verbal information belongs to the Predicate and the most important element of the Predicate is the final one: which we call the **lexical verb**, in the above case: 'give'.

In many languages, there is much less evidence for separating out Finite and Predicate. This led to the basic distinction drawn in classical Greek grammars and since taken up in logic and philosophy between Subject and Predicate. But, for English, this would make certain

[2] Judgements about the acceptability of the second of these sentences vary: what do you think? Also note that the definition of Complement used here is just one of several that can be found in the literature; again, one can ask why are there differences? What questions were the individual authors trying to answer with their formulations? What other terms does Complement contrast with? This is discussed a bit further below.

grammatical patterns, and alternatives between patterns—for example, the use of the do-verb support for questions, more difficult to explain.

As with the ideational meanings, we can now make clear where some of the above types of constituents appear. These overlap with the positions that we have described for Participants, Processes, and Circumstances because very often, Participants 'are' Subjects and Objects, Processes 'are' Finite and Predicator (combined), and Circumstances 'are' Adjuncts: but this correspondence is not a rule. More generally valid is the structural correspondence set out to the right. The first *child* of the sentence node is the Subject; the first NP after the verb is then the Direct Object or Complement; and all PPs after this are Adjuncts. A complete description of any sentence should then include both the ideational and the interpersonal elements; a large part of the flexibility of a language is to be found in how a language relates these two kinds of description to each other.



As we have suggested, and particularly when comparing English and German, we can see that English is, in many text types, very free with just what can become Subject—sometimes we even find things in this position which are not Participants: therefore, although this position is sufficient to define what is a Subject, it is only suggestive of what is a Participant.

Languages can help their interpreters out when complex relationships are being signalled by using the regular structural patterns as a clear scaffold within which particular meanings will be made in particular places. A 'non-neutral' use of the Subject position for Participants or

Circumstances other than you might expect can be indicated by, for example, making the sentence use a passive form.

While this makes clearer some of the positions in the structure of sentences that function interpersonally, we must also note that there are positions of strong interpersonal prominence where the 'boundaries' are, as with Theme and New, not sharp. Or rather, better expressed, they are sharp but they respect their own boundaries rather than ideational constituent boundaries. This is one of the reasons why we need to describe interpersonal structures at all: if they were just other names for the ideational structures or for the syntactic structures then they would be redundant. We would have different names for the same things. They are not, however; they introduce their *own* structurings of sentences, some of which have been considered in arguing for particular syntactic structures over others and some of which have been omitted from syntactic discussions altogether.

Some of the examples of Chapter 2 were already moving in this direction. Consider the sentence from our interrogation dialogue:

> Perhaps I should ask you as a matter of finality, were you in the lounge room when Mr. R was escorted through the house?

Most of the first half of this sentence is in fact interpersonally motivated. Given that the speaker is a legal official in a trial and has all the power, the use of "perhaps" and "should" cannot be seen as indications of uncertainty or hesitation. It is more an evaluation of the information presented so far as being in some way deficient, or less than entirely truthful, or needing to be stated absolutely baldly and without 'hedging' of any kind. The utterance then makes space, interpersonally, for the questioned individual to have one last chance of providing the information requested.

An even more striking example is the following:

> I ain't never been to nowhere like that.

This is not a sentence in "standard English", although there are many variants of English where it *is* acceptable.[3] What

[3] We see the status of some of these variants in the readings.

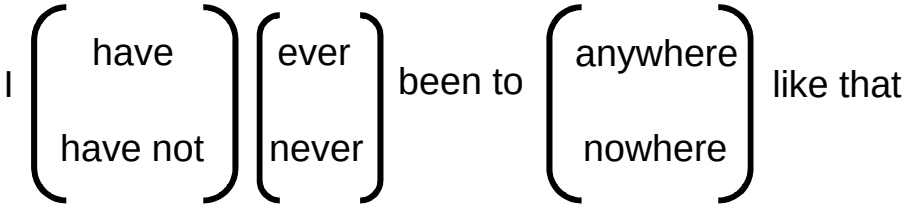
happens in this kind of structure is that an interpersonal **prosody**. Prosody is a term taken originally from intonation, where particular intonational tunes are used during an utterance's delivery by a speaker. We might then have a 'questioning' prosody—usually one in which the intonation, or 'pitch' rises towards the end of the sentence—or a 'statement' prosody—where the pitch falls. This notion of a linguistic detail running *through* an entire linguistic unit was extended radically by the British linguist J.R. Firth. Firth discusses other kinds of prosody, for example *grammatical prosodies*, where some grammatical choice 'runs through' an entire unit instead of occurring at one particular place. In the current example we have the prosody of 'negation' running through the sentence as a whole. This means that negation is not here expressed with one particular part of structure, but is *continually* expressed wherever the sentence structure allows it.

Note that the standard English equivalent shows exactly the same behaviour, but it is often not recognised as so doing. So when we have the sentence:

I have never been to anywhere like that.

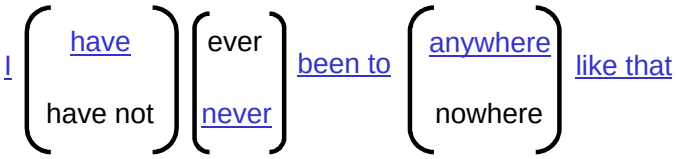
Once the negative meaning has been expressed with the negative word 'never', then the rest of the places in structure that can express a positive or negative meaning *have* to be selected as positive: thus, 'have' and 'anywhere' are both selected in contrast to the 'ain't' and 'nowhere' of the non-standard variety. But the mechanism is the same.

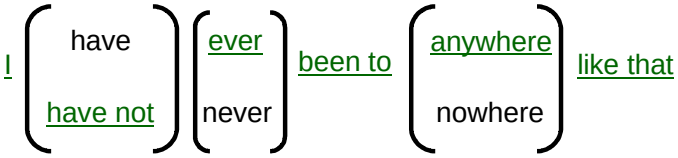
We can show this more clearly perhaps by picking out the particular *choices*, e.g., have/have not, ever/never, anywhere/nowhere, that are available to the speaker or writer in this sentence thus:



Here we show the positive and negative options for those items that naturally carry a polarity choice.

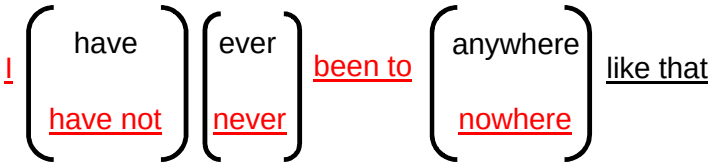
If we then look at the 'standard' English alternatives, we see a clear pattern. Both of the following paths through the options available are classified as 'standard'.





The pattern is that if there is one negative option taken in the Mood element, then we need to take only positive options in the remaining choice points.

This is not a rule of logic; it is a rule of grammar. An argument that one often hears is that the multiple negations are 'obviously wrong' because they 'logically cancel each other out.' This confuses linguistic facts with value judgements about how things should be expressed and how nor. As stated above, there are many variants of English that happen not to have become the 'standard' and which indeed require instead precisely paths such as the following:



Here the rule of grammar is simply different to that favoured for the standard: if we wish to express a negative meaning, then we select negative for all the options that we can. What is crucial for our discussion here, however, is not that there are different varieties of language, but rather that the meaning is not expressed in *one* place in the structure: the meaning needs to be expressed at several points and if we get that selection wrong, then we fail to have an acceptable sentence.

Another just as striking example of this *prosodic* nature of interpersonal meaning is given by utterances such as:

'That stupid animal has damn well run a-bloody-way again.'

Where the interpersonal negative '**appraisal**' of the state of affairs reported is expressed not in a single element of

structure but repeatedly throughout the structure—even, in the case of 'a-bloody-way', in the middle of a word!

When we are confronted with sentences such as these, searching for an exhaustive phrase structure tree can be a difficult business indeed. One effective strategy is therefore to begin by *removing* the particular interpersonal bias, use our rules of structure to work out the grouping, and then to place the interpersonal additions in again at the appropriate places. Therefore, to analyse the last sentence *ideationally* it is enough to take out the interpersonal 'spice' giving:

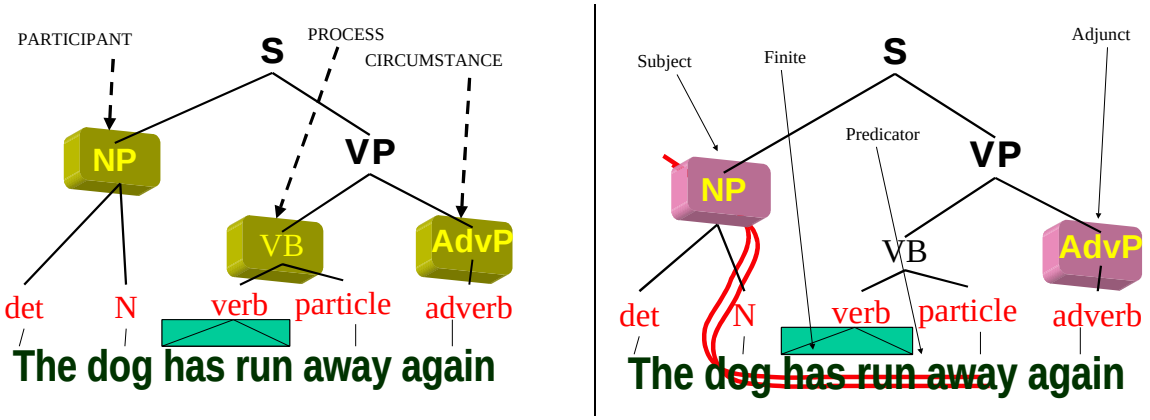
The dog has run away again.

This can be analysed as a simple Participant, Process and Circumstance. This also lets us presume interpersonally that we have a Subject 'the dog', followed by the verbal material 'has run' (which divides into Finite: 'has' and Predicate: 'run away'), and finishing with a Circumstance (an adverbial phrase: 'again'). We know that 'run away' belongs together because our probes and tests do not like them being separated:

* It was away that the dog has run again.

So in some respects the syntactic structure is quite simple and can be set out as in the trees below, where the structural tree can be seen to act as a go-between, *a scaffold or structure on which the various meanings required can be hung*. Moreover, having the structure clearly set out like this lets us see exactly just where the different kinds of meaning can be made in a sentence and how.

Phrase structure and ideational functions	Phrase structure and interpersonal functions



Note, however, that this simplification then leaves out some of the important parts of the meaning of the sentence, and in general we will want to (un)cover these meanings too. Therefore, in *addition* to the simple (ideationally motivated) structure, we should also recognise the interpersonal prosody running through the structure. This is very similar to other interpersonal aspects of the sentence: for example, if there is a strong negative or positive appraisal, then the entire sentence is probably being said in a louder voice than usual, with a particular intonational force, and so on. Similar interpersonal aspects are also found in the grammatical and lexical material (i.e., the words) selected: thus we can have continual repetitions of material with particular interpersonal force; the more repetitions, the 'louder' or stronger the utterance with respect to the meanings made (which is not to be confused with 'more persuasive' or 'more effective'!).

The two kinds of structures superimposed here—the phrase structure and the functional structures—also bring out well the different views of clause structure introduced above in terms of maximal and minimal bracketing. The maximal bracketing perspective tries to explain as much as is possible in terms of quite complicated tree structures; the minimal bracketing approach is content to explain some of the properties of clauses in terms of trees (primarily the basic syntactic structure in terms of nominal groups, verbal groups, prepositional phrases, etc.), and the rest in terms of added *functional* information or labels. As very often in linguistics, there are different ways of sharing out the work to be done: different descriptive mechanisms can be

appropriate for different tasks and being able to move between these flexibly provides a very powerful (and empowering) way of looking at language.

It is interesting to note that some views of grammar, and especially 'school grammar', take the elements of interpersonal meaning as basic without even noticing that there are other phenomena that are occurring at the same time. This makes it more likely that things that appear to be 'exceptions' occur because therir real sources are left unclarified. However, for languages, such as English, which actually place a heavy burden on interpersonal structures, the simplification is quite understandable.

Nevertheless, the 'traditional' school grammar views of the parts of sentences—Subjects, Objects, etc.—can best be understood in English as belonging to the interpersonal area of meaning: which leads to quite a bit of confusion when people attempt, as they sometimes do, to give ideational descriptions of them: for example, the 'Subject' (interpersonal) is the one doing the action (ideational), or the 'Direct Object' (interpersonal) is the object or person to which the action is done (ideational). Languages tend to be more flexible in the relations they draw between ideational (Participant, Process, Circumstance) and interpersonal (Subject, Finite, Object) elements: and some languages are more flexible than others. English, for example, is significantly more flexible in this regard than German and we frequently find considerable disassociation between interpersonal and ideational elements.

Some of the difficulties, however, that can arise when the interpersonal elements corresponding to 'grammatical functions' are singled out as *the* basic organisation of sentences can be seen in the following table, which depicts the 'basic sentence orders' assumed by one introduction to English linguistics (Kortmann, 1999: 96).

Tab. IV.7 Die sieben grundlegenden Satzbildungsmuster

Muster	Subjekt	Prädikat/Verb	Objekt(e)	Komplement	Adverbial
SV	The girl	was sleeping			
SVO	Her mother	was dressing	the baby (O_d)		
SVK	Little James	seemed		very happy (K_S)	
SVA	He	was sitting			on the table
SVOO	Mrs Bates	gave	her children (O_i) all her love (O_d)		
SVOK	Most people	considered	her (O_d)	a perfect mother (K_O)	
SVOA	She	had spent	all her life (O_d)		in the village

Here we can see that there are some differences in classification: e.g., Objects are distinguished from Complements, and Adjuncts are referred to as *Adverbiale.* Kortmann notes that the definitions of complement vary widely and restricts his usage to refer to constituents that complete copula expressions (e.g., the object of verbs like 'to be'). On the basis of this, this author gives 'seven' basic patterns for English clauses. But, and given the variation in the definitions that one may find, it should not be surprising to learn that other authors give different numbers.

It is, of course, difficult to specify once and for all that a language has so and so many "basic sentence patterns"—this is probably not a linguistic statement at all, but rather one of those 'simplifications' of the map adopted to make some task, such as language teaching, easier. Teaching these seven may after all present a more manageable arrangement of the material. Whether it makes the teaching of *linguistic*s easier depends on how well one understands the nature of simplified maps of the territory. Certainly being aware of this as a simplification places one in a far better position to understand that sentences that do not conform to the given patterns (and there are very many of these) are not necessarily curious 'exceptions'.

Moreover, regardless of the particular simplifications that any particular author may suggest, all such sentence patterns must correspond in some way to the syntactic structures of the language being addressed: thus if we can take any sentence apart according to its constituency structure, we should also be able to work out what the particular patterns of any sentence are *without* needing to

state that some are 'basic' and others are not. It is only when we are not in a position to describe the syntactic structures of a language that we need to resort to simplifications such as 'basic patterns'. As linguistically more sophisticated 'language professionals' the safety net given by a simple short list of 'basic structures' should of course no longer be necessary, for neither the teacher nor the practicing linguist.

Another problem is that there are of course many variations on the basic ordering given in the above table. Sometimes the objects are *not* after the verb but before it for example. Is this then a new pattern—presumably not, otherwise it would have been included as one of the 'basic' patterns. We need then to look beyond abstract general patterns to be able to recognise any particular sentence pattern that occurs in an actual text. This is again a good example of a simplification made for the purposes of teaching: we could single out a range of different aspects of linguistic structure and use this as *the* description of what is going on, as *the* map of the territory we are introducing.

But whenever we make a simplification like this, then certain phenomena, certain differentiations, are going to appear unmotivated or difficult to understand—*simply because the distinctions necessary to make sense of them have been withheld*. A very valuable component of learning to work linguistically is to be able to make these kinds of judgements—what simplifications are appropriate for what situations for what audiences—**yourself**.

8.1.3 Textual meaning

The last of the three basic kinds of meaning to be considered here is textual meaning. Textual meaning, as we saw in Chapter 2, is to do with the organisation of text. It is a crucial component of meaning, because without it there would not be any text. However, when you read introductions to linguistics or grammatical structure, the textual pulse will often be left out or explained in terms of some of the other kinds of structure that we have seen. This makes some real sentences as we may find them in natural texts more difficult to explain and to analyse than necessary.

Choices of what to make textually prominent often cut across other kinds of organisation. For example, consider the following sentence:

No one has slept in this bed for many years.

We can employ our tests and probes from above to find the constituents of this sentence. We would find that we have a Process *slept*, a Participant *no one*, and two Circumstances: a time *for many years* and a place *in this bed*. We can also do permutation tests to see that we can move these constituents around somewhat—for example, we can take *in this bed* to the front of the sentence:

In this bed no one has slept for many years.

As we now know, this would have the effect of making 'in this bed' the Theme of the sentence: it occurs at the strongest point of the textual pulse. But what of the following sentence?

It was this bed that had not been slept in for years.

If you try to carry out a rank-based (minimal bracketing) grammatical analysis and a phrase-structure (maximal bracketing) analysis of this sentence, you will probably encounter a range of difficult decisions.

What makes this kind of sentence difficult is the fact that there is so much going on in it that is not simply a reflection of a configuration of process, participants and circumstances. Somewhere in the sentence we would like to find that the Process is something to do with sleeping and that there are both a spatial circumstance (in the bed) and a temporal one (for years) as we saw with the more straightforward renditions above.

But in addition to this we are left with a number of loose ends when we try to complete our analysis using the phrase structure perspective map of the clause. For example, if we indeed have a circumstance of location of 'in the bed', where has our expected prepositional phrase gone? The straightforward structural PP that we would like to find:

$[_{PP}$ in $[_{NP}$ the bed]]

is not there any more. It has, using the analogy above, been 'deformed' due to the functional load of needing to stress or

emphasis or focus (all words that need to be understood far more closely when we look at them linguistically) particular elements of the clause rather than others. This can lead to misleading and inaccurate analyses where we might presume that there is a special verb 'to sleep in', similarly to 'to call up' or 'to look up'. But this is not at all motivated: in the example sentence there is no special meaning for the combination 'to sleep' plus 'in'.[4]

The meaning of the example sentence clearly contains additional information concerning its textual use. That is, it is only going to be used in contexts where the particular bed in question is being picked out and isolated for some reason in the interaction or text. In the terms being used here, the *textual* meaning has required a particular arrangement of the *ideationally* motivated elements. This can occur in a variety of ways, for example in:

This bed has not been slept in for years.

we see that what is in the textually most prominent position is now the phrase 'this bed'. But this is *not* a Participant, Circumstance or Process of the sentence. Nor, as noted above, do the words 'sleep in' make up a phrasal verb in this sentence. The textual pulse has in an important sense *ignored* the ideational constituents of the clause for its own purposes.

Many kinds of apparently 'discontinuous' constituents—i.e., parts of a sentence that appear to be spread across a sentence rather than all occuring in one place—are the direct result of the pushing and pulling of the textual pulses. This naturally presents substantial problems for those accounts which have too rigid a notion of consituency. Constituency is important and central for language interpretation, but must also allow sufficient flexibility to 'bend in the wind' of textual need.

One strategy for dealing with this kind of phenomenon is then as with the variations caused by the interpersonal meanings: i.e., to think what the sentence might be without

[4] There is, of course, a phrasal verb "to sleep in"—but this is not the form or the meaning that is being used here.

the textual variation and to establish what that sentence might have as a structure. This will usually allow the ideational meanings to be established and also provide a good starting point for the syntactic phrasing involved. Then the textual pulse will 'pull' that structure apart somewhat, but the syntax of languages has evolved precisely to allow such pushing and pulling and the basic relationships established in the 'neutral' version will still be interpretable in the non-neutral version.

Another compatible way of seeing what is going on here is to involve the interpersonal elements of the sentence. We have seen that Circumstances (such as 'in this bed') are commonly expressed by prepositional phrases; we have not said much about how interpersonal *Adjuncts* are expressed however. These are, in fact, very flexible: this is to be expected because the work that they do, the 'load' that they carry, is interpersonal and not ideational: that is, they can be providing a slot for very different kinds of information. We can therefore give the *interpersonal* structure of the problematic sentence above as follows:

This bed	*has not*	*been slept*	*in*	*for years*
Subject	Finite+Negation	Predicator	Adjunct	Adjunct
Mood		Residue		

Thus, from the interpersonal perspective, it does not look as if anything particularly problematic has occured. We have quite a normal sentence in which the 'in' *appears* more like a particle of a phrasal verb: thus, even though there is no phrasal verb 'to sleep in something' the grammar of English is flexible enough to make an expression that has some of the feeling of a phrasal verb should it need to. The motivation for 'needing to' comes from the textual meanings that are to be expressed. We also see this kind of structure in a sentence such as the following, which you might hear when negotiating topics for an assignment:

Sorry, that topic is already being written on.

Again, there is no phrasal verb 'to write on', but we nevertheless have the possibility of constructing a structure such as:

write	*on*
Predicator	Adjunct

One final example of 'discontinuity' motivated by textual considerations comes from some Telecom example texts drawn from newspaper reports; it is the following sentence:

> Telecom employees are likely to reimpose work bans or strike within a week unless their demands are met on pay negotiations.

When we try and find the constituents in this sentence we should find that *demands* and *on pay negotiations* are quite strongly connected. You typically have 'demands on' or 'demands about' something. We can also write sentences such as:

> Their demands on pay negotiations have not been met.
>
> You must meet my demands on pay negotiation or otherwise I will resign.

But in the text we find these two parts of the phrase split apart. This splitting serves again largely textual functions. It allows the main point of news or information to be made more strongly.

If we read this sentence with the main emphasis on 'met' (as a newsreader might well do), we express that this is the main point of news of this part of the sentence while 'on pay negotiations' is strongly given (because the news item has been running for a few days and, after all, for this newspaper, what else would the demands be about if not pay?). If we left the two parts of the phrase together, as in:

> Telecom employees are likely to reimpose work bans or strike within a week unless their demands on pay negotiations are met.

We have a much weaker phrasing where the neutral new information is 'met', 'on pay negotiations' is also quite new, and 'demands' is so weakly new or given that it is impossible

to clearly decide. It is virtually impossible to put much stress on 'met' even if we wanted to.

In summary, textual meanings are an important part of texts—and they often have 'distorting' effects on the structure of sentences that are difficult to explain or motivate unless you keep the textual meaning in sight. The syntactic scaffold of a clause revealed to us in the phrase structure rules can thus be 'bent' in various ways—but not without limits; the most interesting studies, therefore, use both these ways of looking at clause phenomena to try and chart the limits of the possible and to describe the functions that such 'distortions' have when constructing connected written or spoken texts.[5]

While that completes our view of different kinds of structurings for different kinds of meanings, we will see below that these notions reoccur when we are considering other aspects of the linguistic system than grammar. We will see that constituency, prosody and pulse turn up again and again—whether we are talking about sounds or about text. And their linking with these different kinds of meanings is often a very useful hint as to what work the patterns found are doing.

8.2 Compositional semantics

Traditionally discussions of the meanings of sentences have drawn much of their impetus from notions of logic. This has also influenced the kinds of grammatical structures that have been developed for describing languages. This can be contrasted with approaches to meaning that draw more on 'rhetoric' than logic—i.e., accounts that describe what speakers are doing and what to achieve with their language rather than language as a description of states in the world. The kinds of meanings that we have discussed so far in this chapter, involving the ideational, interpersonal and textual perspectives, are very much in the rhetorical tradition. In

[5] Some linguists take these 'distortions' and their power to overrule simple grammatical structures as convincing arguments against having syntactic structure at all. This argument is, of course, much easier to make for spoken language than it is for written language. It is unlikely that the structural complexity observable in written language can be dealt with without at least some notions of recursive phrase structure however.

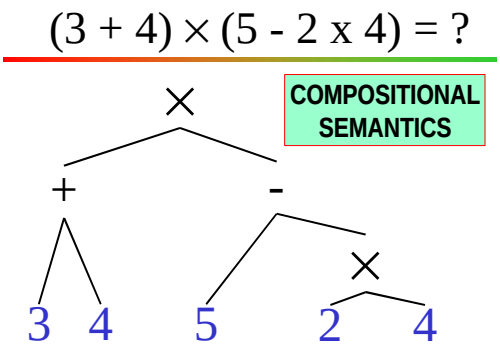
this section, we turn to the very different take on the relation between structure and meaning that we find in the logical tradition.

One of the points we have made right from our first introduction to structure is that different structures lead to different interpretations. But how? How can a structure lead to any kind of interpretation at all? In order to be explicit about this—and we need to be explicit about it if we are to be sure that we know what are talking about—we need to spell out in considerably more detail just what it is that structure and interpretation have to do with one another.

One of the most basic assumptions that has been made concerning the interpretation of the meaning of sentences is that this meaning, the **semantics**, can be built up on the basis of the structure. This kind of semantics is called *compositional*. Compositional semantics means that you can put the meaning of the whole together out of the meaning of the parts.

This is then one of the most important purposes of phrase structure. The particular tree structure that we have shows (i) exactly the order in which the meaning of the parts may be combined in order to work out the meaning of the whole, and (ii) which parts go with which others. This is a very useful working hypothesis because it means that if we can say what the meaning of the parts is (and this is hoped to be a simpler task than saying directly what the meaning of a clause is, for example), then we can *work out* the meaning of the whole more or less automatically.

As a simple example, we can see this in a syntactic structure for a piece of arithmetic.



If we take the 'meaning' of the arithmetic expression to be its value when we work out the sum, then the syntactic tree tells us exactly how to do this. We first take the 3 and the 4 and add them together; then we take the 2 and last 4, and multiply those together. Then we take this away from the 5. Finally we multiply the result of (5-2×4) by the result we got earlier by adding 3 to 4 to get the meaning of the whole.

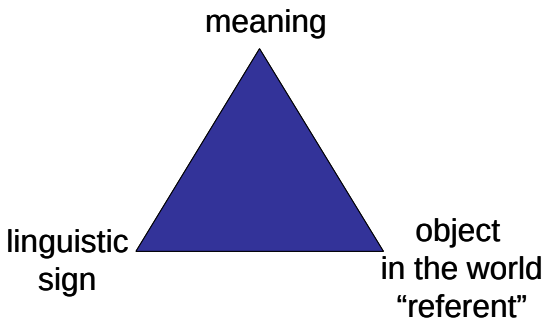
The idea of compositional semantics is then that we have exactly the same kind of thing going on with expressions in language. Of course, we do not have numbers, and we are not dealing with addition, multiplication, etc. but the principle remains. We *combine* (in a way to be specified) smaller meanings to arrive at larger ones.

To see this in action, lets take a simple linguistic kind of example: how to work out the semantics of the clause 'the dog chased the boy'.

First, we need to know what the parts to be combined are. This is easy because it is exactly what a phrase structure analysis tells us. Expressed as a labelled bracket expression, the clause structure is simply:

$$[_{S}\,[_{NP}\text{ the dog }]\,[_{VP}\text{ chased }[_{NP}\text{ the boy}]]]$$

For the meaning of the parts, we need to assume some basic semantics to start from. This is generally handled by the area of *lexical semantics*, introductions to which you will have seen in the reading. As a shortcut for now, let us assume that the semantics of 'the dog' is something that picks out the particular object in the world that we are talking about; the same with 'the boy'. This relates to the standard 'semiotic triangle' discussed by a number of linguists, semioticians and philosophers of language.

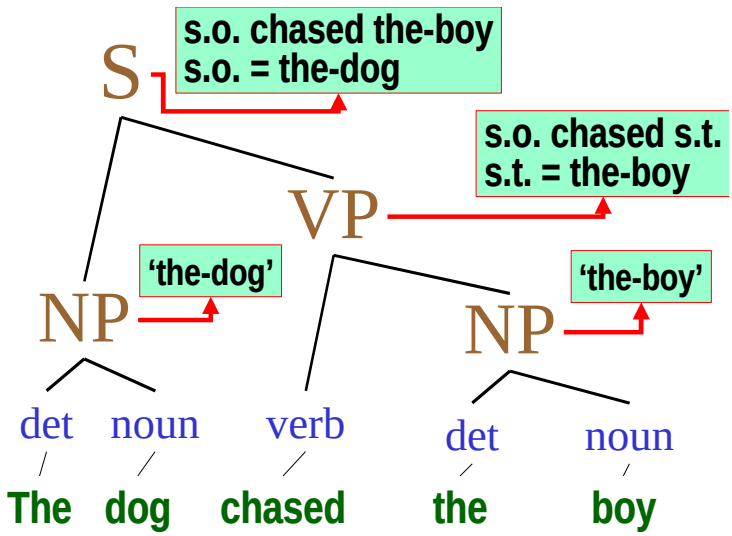


The meaning of the verb ‘chase’ is more complex. We cannot just say that the meaning of ‘chase’ is that it picks out some chasing in the world that we wish to talk about: that would avoid the very problem that we wish to solve. Again, for now we will adopt a simplification and just describe what kind of thing the meaning of a verb such as ‘chase’ could be. Essentially we need to say that there is some event and that there are participants in that event. This is very similar to the notions of Process and Participants used above, although now we are moving to wholly into semantics rather than considering grammatical patterns.

We then have the following bits of semantics to be combined:

language expression	**semantics**
“the dog”	some dog X in the world
“the boy”	some boy Y in the world
“chase”	someone chases something

It is then the syntactic phrase structure tree that guides the combination. This can be depicted graphically as follows.



That is, we make the meaning of a VP by taking the meaning of the V and combining it with the NP it ‘dominates’. This gives us the piece of semantics

someone chases the boy Y that we are talking about

We then form the meaning of the S by combining the NP and VP that it dominates. This then replaces the 'someone' in the semantics by the meaning of the NP, giving:

> the dog X that we are talking about chases the boy Y that we are talking about

This then makes it clear how different structures lead to different interpretations.

When we are describing semantics, we often use logical notation—logic is in fact very useful when working with semantics of this kind. We can see this here as a way of writing our rather unwieldy statements such as "someone chases the box Y that we are talking about" much more succinctly. Lets do this just for this example as an illustration so that you can see that, when used in readings of various kinds, nothing mysterious is being done. We typically write 'some dog X' simply as:

dog' (x)

and 'some boy Y' similarly as:

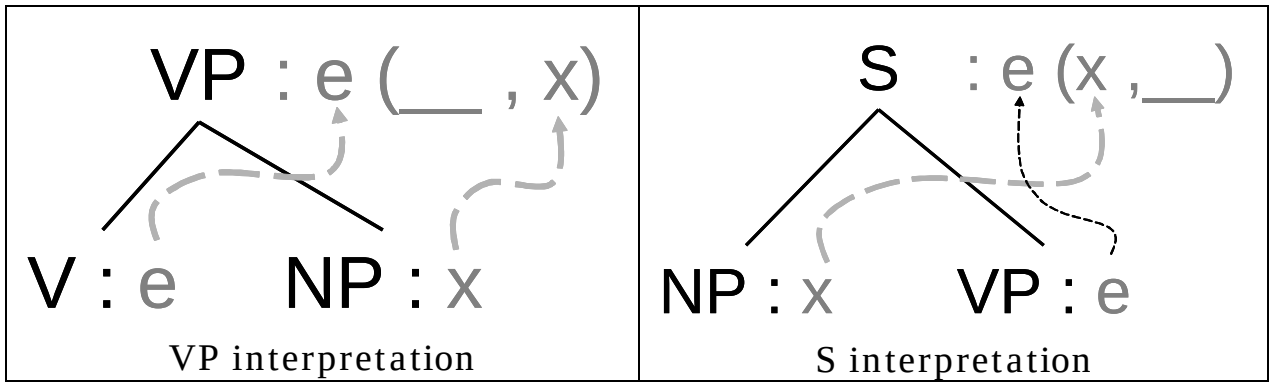
boy' (y)

The dash after the word is to remind us that we are here dealing now with semantic terms rather than simple words. These are names for the items at the top of our semiotic triangle above and correspond to the meaning rather than the words and the objects in the world. A logical expression can be true or false. The expression dog'(x) is then true in those situations where 'x' is a name for something in the world that is actually a dog. This kind of representation is called the **predicate calculus** because it deals with predicates, i.e.., the terms dog' and boy' that apply to *variables* such as 'x' and 'y'.

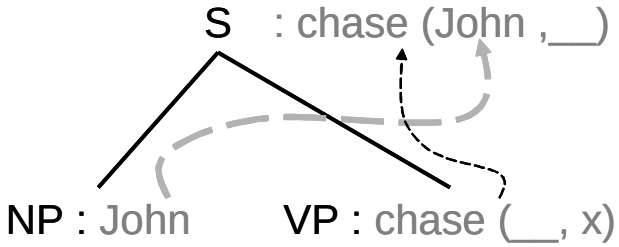
Because these predicates only apply to single variables, they are called **one-place predicates**. For the semantics of more complex entities, such as the 'chasing', we need what are called **two-place predicates**, because they relate to other simpler entities (the thing chasing and the thing chased). This can be written simply in logic as the expression:

chase' (x, y)

Then as a last step we can write our compositional semantics in terms of **semantic interpretation rules**. And these, crucially, refer to particular chunks of phrase structure. The two interpretation rules that we need for our example sentence could be written then as follows, using all that we have seen so far.



The left-hand rule says how we take the semantics of the parts of a verb phrase and can combine these into a skeleton of a semantic representation: the semantics of the verb gives



us the predicate while the semantics of the NP gives us the second term of the predicated (the 'chased' in our current example). The right-hand rule does the same for the parts of a sentence. How this fills in particular values is shown for a sentence such as 'John chases something' in the following diagram:

The crucial idea is that that it does not make any difference precisely which sentences we have, the same rules of semantic interpretation can apply. Exploring meanings in terms of logic is a very powerful way of showing exactly what contributes to the meanings of linguistic terms. The close link with phrase structure should also make it very clear just what role is played by phrase structure: it is an essential signpost for directing how meanings can be worked out.

Nevertheless, the value of this exercise of semantic composition may perhaps still be being obscured somewhat by our English descriptions of the semantics; if we instead were trying to describe the semantics of a language that we did not know, then the role of the phrase structure should become even clearer. For example, consider the following sentences, the first from the language Malagasy, the second from the language Hixkaryana spoken in the Amazon Basin:

(a) Nahita ny mpianatra ny vehivavy

(b) Kana yan\mno b\ryekomo.

In linguistics, when we are discussing sentences from languages that the reader might not be familiar with, it is generally advisable to provide what is called an interlinear **gloss**—this simply means that we write below the actual sentence (i.e., 'between the lines': interlinear) a representation of what the words used mean. For these two examples this would look as follows:

(a)	Nahita	ny	mpianatra	ny	vehivavy
	see	*the*	*student*	*the*	*woman*

(b)	Kana	yan\mno	b\ryekomo.
	fish	*catch*	*boy*

This can give us an indication of the meaning but, as we shall see, it is not yet enough.

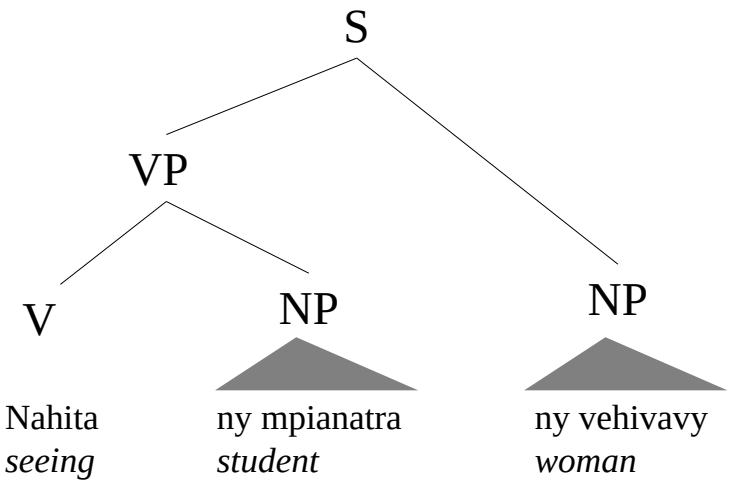
If we take the meanings of the individual parts of these sentences and describe their semantics, again using English and set out in a table, we will soon see very clearly that the semantics is not just 'the same again' as our example with English above. We will omit the Malagasy word 'ny', which, as we see from the gloss above, corresponds to the English definite article 'the'.

language expression	**semantics**
nahita	someone sees something
mpianatra	some student X in the world
vehivavy	some woman Y in the world
kana	some fish X in the world

yan) mno	someone catches something
b) ryekomo	some boy Y in the world

In order to work out the meaning of the sentences as a whole, we need to know the phrase structures that the languages employ. If we do not have access to this structure, either implicitly by virtue of knowing how to speak the language concerned or explicitly as a piece of linguistic knowledge about the languages, we cannot work out what the sentence actually means. This is particularly important in the case of our two examples because they actually have very different structures to those for English (or German).

Let's take the Malagasy sentence first. We will examine the phrase structure and apply what we have seen above concerning compositional semantics. An appropriate phrase structure for the example sentence, i.e., one that the test and probes would reveal when answered by a speaker of the language, is the following. Note that this structure would *not* be one that is possible for English!



Now, although we can apply the same kinds of *rules of semantic interpretation* that we saw for English, the linguistic elements we take and their order of combination is automatically different—different because the phrase structure gives us different instructions for putting those elements together.

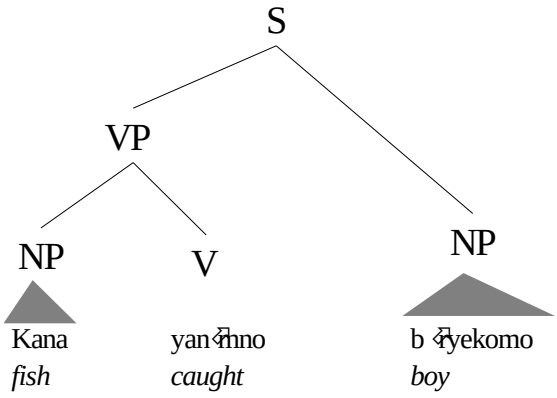
The first elements to be put together are, as before, those of the verb phrase. This VP combines the semantics of the V 'someone sees something' with the semantics of its noun

phrase, the NP 'student'. We saw above, and for the present we will just reuse this fact, that the VP incorporates what would in English be called the object, or the 'thing which is effected or perceived'. Whereas in our English example, the semantics of the VP therefore because 'someone chased the boy', in the Malagasy example we have similarly 'someone saw the student'.

We then go up the tree to consider the semantics of the entire sentence, which is formed by putting together the semantics of the S node in the tree—i.e., we combine the semantics of the VP, 'someone saw the student', with the semantics of the NP for 'woman'. And again, with the S node, the child NP can be considered for the moment as contributing the Actor or Agent of the overall semantics. Actually, and as we saw above, it may be better viewed as contributing the Subject, but we can omit this subtlety for now. Carrying out the combination then gives us the final semantics for the sentence:

'the woman saw the student'

Since this is exactly the opposite order of elements to those that we have in the original sentence, we can see that without the phrase structure there to guide our interpretation, we would not have been able to decide who it was who was doing the seeing and who was being seen.



The Hixkaryana sentence is again similar, but different. An appropriate phrase structure is as shown on the left. We can build up the semantics as we did with our last example: first building the semantics for the VP, i.e., 'someone caught a fish', and then combining this with the NP child of the S node, to give the final semantics:

'the boy caught a fish'

In this case, we may have been able to guess the semantics because it is more often the case that boys catch fish than it is that fish catch boys: this shows the pervasive influence of semantics in our interpretative efforts. But this could just as

easily have been a wrong guess: the boy could have been quite small and the fish quite large. It is only the *phrase structure of the language* that allows us (in these cases) to arrive at a definitive answer as to the intended meaning of the sentence.

Languages often vary in the way shown here and in many others too. The fact that we do not reflect very often on our own linguistic habits leads us to assume that many more details of our language are 'natural'—i.e., they could not be any other way. This is a particularly dangerous assumption and is usually wrong: many cases of intercultural communication problems arise out of this, often unstated and unrealised assumption. This is also an obvious source of problems in language learning and teaching: differences between languages of this kind clearly indicate areas where learners will need more explicit and detailed instruction and practice in order to overcome the habits of their own language. In grammar, as our last two examples have shown us, there is in fact considerable variation and one needs to be very aware of this when dealing with members of language communities where such variation occurs.

This kind of variation is the general subject matter of **linguistic typology** and **contrastive linguistics**. Malagasy is said to be a **VOS language**, indicating the 'usual' order of elements in a simple sentence is first the V, then the Object, and finally the Subject. Hixkaryana, in contrast, is thought to be an example of a very rare class of languages, those which are typologically **OVS**, i.e., first the Object, then the Verb, and finally the Subject. Both are clearly distinct from the familiar **SVO** order of English. We will hear more of these different classifications of language later.

Naturally, a statement such as "English is SVO" cannot be interpreted over-literally—there are very many sentences where this order is not reflected directly (e.g., in questions, in many textually re-organised clauses, and so on). The statement is a *typological* one that serves to distinguish English from a whole collection of other typologically distinct languages (such as the Hixkaryana we have just seen). This actually leads us back to phrase structure: what the

statement means is that we will find certain phrase structure configurations rather than others—not that when you build sentences you will always find Subjects before Verbs before Objects. But the main message for now is that without the underlying phrase structure grammar for a language, we cannot interpret even the simplest of sentences reliably.

We have now seen in this section how modern linguistics, particularly semantics, has come to address one of the oldest and most difficult questions concerning language at all: how is it that speakers can attribute meaning to the utterances they encounter. A sufficiently detailed view of the syntax of a clause, plus a set of rules for semantic interpretation that are associated with the syntactic constructions found, can provide a blueprint for constructing complex semantic interpretations. The view of semantics that we construct using predicate logic and that of grammar given by the phrase structure map fit together naturally because both are drawn from the 'logic-based' approached to meaning and language mentioned above.

Working out the details of these accounts is in fact a very active area of research in linguistics for both theoretical and practical reasons. Practically, being able to specify the rules by which utterances are interpreted semantically is a crucial step towards being able to understand utterances and produce them automatically—this is one of the areas of **human language technology**, which is rapidly redefining just what it means to 'apply' linguistic results. Areas of linguistics previously considered more abstract or theoretical, such as detailed semantic interpretation, are being looked to for precise specifications for how to build computer-based tools for helping writers via more accurate style checking, for information retrieval, and a host of other very practical concerns.

This view of semantics is also a very important 'reality check' for people who are trying to work out more exact syntactic descriptions. If the syntactic descriptions proposed make it more difficult, or impossible, to uncover a semantic interpretation, then this can be considered a strong point against the proposed model. Much of current linguistic

research concerns this consideration of the mutual constraint offered by different levels of linguistic description. It lets us see what makes a 'good' structure from the semantic perspective.

Current work in semantics is also coming to grapple with the fact that semantic interpretations are not complete: they provide only a framework, or skeleton, which particular readers and particular contexts may come to fill in in different ways. The important technical term here is **underspecification.** Approaches to semantics are trying to leave the semantics that is worked out in the manner described in this section with particular well-defined 'holes' that allow further refinement from the knowledge of the reader or the context. This again is an example where the latest directions in semantics overlap with other attempts to understand the fundamental issues of text interpretation. Constructing explicit and detailed accounts of the mechanisms of semantics, which also are sufficiently powerful to allow variation in meaning according to reader and context, is an extremely exciting research area.

References

The VOS/OVS language examples were taken from:

Aleksandra Steinbergs (1996) "The classification of languages", Chapter 9 in O'Grady, Dobrovolsky and Katamba (1996) *Contemporary Linguistics: an introduction.* (3rd edition). Longman.

The basic types of sentence structures in English were taken from:

Kortmann, B. (1999) Anglistische Sprachwissenschaft. Cornelsen.

9 “And what would you say it’s made of?” — Trees and Rules

WHAT WE ARE DOING THIS CHAPTER.

We have seen syntactic trees as used for phrase structure and have considered some of the information that they need to carry. In this chapter we have a brief introduction to the modern tools of linguistics that are used for working with trees and similar kinds of linguistic representations more effectively. This is the area covered by grammatical rules, which tell us exactly which trees are allowed and which not. These are rules in the linguistic sense rather than that of traditional grammar books. A linguistic rule is a property of the language, not a guide to how one should speak. These kinds of rules cannot be broken!

We saw in one of our opening examples in Chapter 2 an interviewee rather placed on the spot with the following curious question about language—"what is it made of"? In this chapter we provide more detail concerning the answer that linguistics currently provides. By now we have also seen a wide range of different kinds of linguistic structures and have shown some of what can be revealed about the additional meanings of texts when we go about looking at those structures systematically: i.e., when we look to see what has been chosen to appear as Processes, Participants, and Circumstances, what selections have been made for Theme, and for Subject. These kinds of analysis can be taken very much further, providing ever closer readings of texts. But we have also come across a range of sentences whose structures are quite difficult to describe. With the rules and probes that we have explored so far, we may still be in some doubt occasionally as to exactly what is the Circumstance or what is the Subject and so on.

As long as the analysis is unsure, the results of analysis are more likely to stray into error and so make the patterns of meaning by which texts work more difficult to perceive. There is also a much greater likelihood that different analysts will come up with differing analyses: it is a primary goal of being systematic and of employing well defined criteria for any decisions made that different analysts will arrive at the *same* analysis. Only with this **cross-coder consistency** (or, equivalently as it is also called: **inter-coder reliability**) can we really lay claims to having arrived at a more stable interpretation of a text than we might have achieved by guesswork. We can make an analogy to trying to get the sense of a TV programme if the signal is very bad, or if there is interference: the actual patterns that let us recognise images on the screen might be more or less distorted so it is difficult to see what is going on; poor analysis can have exactly the same effect on our ability to uncover the patterns in texts.

This then brings us back to one of the most important and central areas of linguistics—one which has almost come to dominate the field for many people. This is the area of grammatical structure. We have attempted not to let

grammatical structure take complete hold of the discussion—it is, after all, merely a tool for revealing more of the meanings that are being made in texts—but it will nevertheless be necessary to provide more detail here for you to see how the kinds of descriptions of syntactic structure seen above have now grown into a view of language almost inconceivable a mere 50 years ago. As stressed above: we are not just concerned with the introduction of some theoretical concepts in this course, it is also an aim that you be able to apply this knowledge in the analysis of all texts that you come across. This will naturally require refinement and extension later on, but one function of this introduction is to get you started on this.

This chapter will therefore introduce the basic concept that underlies the kinds of *constituency structure* that we saw earlier: that is ***phrase structure grammar***. This is undoubtedly where some of the most detailed results have been achieved in linguistics to date: the understanding that we now have of the nature of linguistic structure bares little resemblance to how it was understood even during the 1940s and 50s; we can accordingly do little more here than scratch the surface in this rapidly expanding and exciting series of developments. But even this will provide a considerably deeper understanding and additional tools that can help us carry out analyses of texts such as illustrated above with more accuracy and less uncertainty. An appreciation of 'structure' is essential to many areas of linguistics (and other disciplines!) and so the time spent on this is in any case well justified.

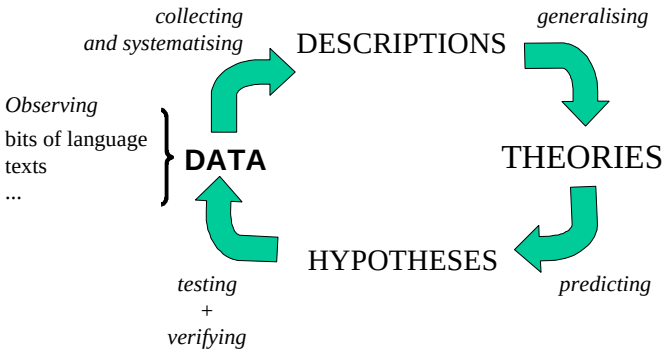
9.1 Syntactic rules and phrase structure grammars

The final step away from chains of words to something approaching modern linguistics lies in a further generalisation over the kinds of phrase structure trees that we have been using up to now. Noam Chomsky, another founding father of this particular line of linguistics, showed in his slim book from 1957 simply called *Syntactic Structures,* that a particular kind of mathematical rule—called the **rewrite rule**—could be used to good effect for many of the linguistic structures that we have seen. Starting from this simple observation, the landscape of linguistics as

a whole gradually changed over the 1960s and 1970s so that today an understanding of language without a knowledge of basic phrase structure grammars and their rules is inconceivable.

The rewrite rule provides a straightforward way of saying what trees are *possible* in a linguistic description. This lets the linguist away from the position of having to describe every sentence as it comes, for better or worse. With phrase structure rules it is possible to make general statements about what trees can be built at all. This was a fundamental change in how one goes about linguistic description and started off an entirely different kind of inquiry. Linguists started talking about the **language system as such**, the grammatical system, etc. as abstract constructions that had their own properties. It became possible, therefore, to ask questions as to what would be a possible grammar for a human language and what not. Questions which later feed directly into debates about the difference between human language and other kinds of communication systems (such as that used by chimpanzees or bees) and to issues of how it is that language learning by children can proceed so reliably.

This also marked the development away from observations that sentences appear to have phrase structure of various kinds, and towards a theory about language structure. The rules specify, i.e., *predict*, what kinds of trees are possible, and hence what kinds of linguistic structure is possible. A crucial property of such theories is that they can be *wrong*: that is, we can make predictions about structures that are possible that are not found in a language or are rejected by speakers of a language as being anomalous. As we saw in Chapter 3, testing prediction against the empirical 'facts' is the driving force that can result in new, improved (i.e., more accurate) theories.



The form of a rewrite rule is quite simple: a **left hand side** (typically a syntactic label such as NP, PP, etc.) is broken

down into its immediate constituents by the **right hand side** of the rule. Thus, we can sum up the possible structure of all prepositional phrases in English with a single rule such as:

$$PP \rightarrow \text{preposition NP}$$

This states directly that whenever we see a node in a tree labelled PP, we can replace (rewrite) it as containing two immediately dominated nodes, a preposition and a NP. Other rules that would go with the structures that we have seen so far would be the following for NPs such as:

$NP \rightarrow$ determiner noun

$NP \rightarrow$ determiner adjective noun

The first describes noun phrases such as 'the gnome', 'the boy', 'the garden', etc.; the second describes noun phrases such as 'the small boy', etc. Our next rule then combines NPs with PPs, to cover phrases such as 'the boy in the garden':

$NP \rightarrow NP\ PP$

Note that because we have used the general label NP on the right hand side of the rule as well as on the left, the very same rule also covers all such phrases as: 'the gnome in the garden', 'the small boy in the garden', while the embedded NP within the PP means that the rule also covers 'the boy in the small garden'.

Another way of viewing these rewrite rules is as a way of making explicit just what *substitutions* are going to be allowed in our grammar. Remember that substitution was one of our tests and probes for grammatical constituency. When we write a rule for a grammatical category such as noun phrase, NP, we are saying that anything that can be described as an NP can be *substituted* at that point. So our last rule means that whenever we have something that we are happy to call a noun phrase, we should be equally happy about seeing that same noun phrase with a prepositional phrase after it. Naturally this works fine for NPs such as 'the boy', 'the small gnome', etc., because we are also going to accept NPs such as 'the boy with the telescope' and 'the small gnome in the garden'. If, however, we are also happy to accept a simple pronoun, such as 'she', as a NP, then the

above rule would mean that we should also be happy to accept 'she in the garden' and 'she with the telescope'. If you do not find these phrases equally acceptable, than that is a further *empirical* result that would suggest that the rule in fact needs to be changed. The ability to measure what a grammar 'does', i.e., what structures it predicts to be acceptable, against what is actually the case for a language is precisely what is meant by talking about the empirical cycle in grammar writing.

The rules we have so far just describe structural configurations, i.e., possible structural 'shapes' that sentences in English can be made up from. We also need to say which words can actually occur in these syntactic forms. And for this we need a slightly different rewrite rule, called a **lexical insertion rule**, because it is responsible for saying which words can be 'inserted' into structures. A simple example of such a rule would be the following for nouns:

$N \rightarrow \{dog, boy, gnome\}$

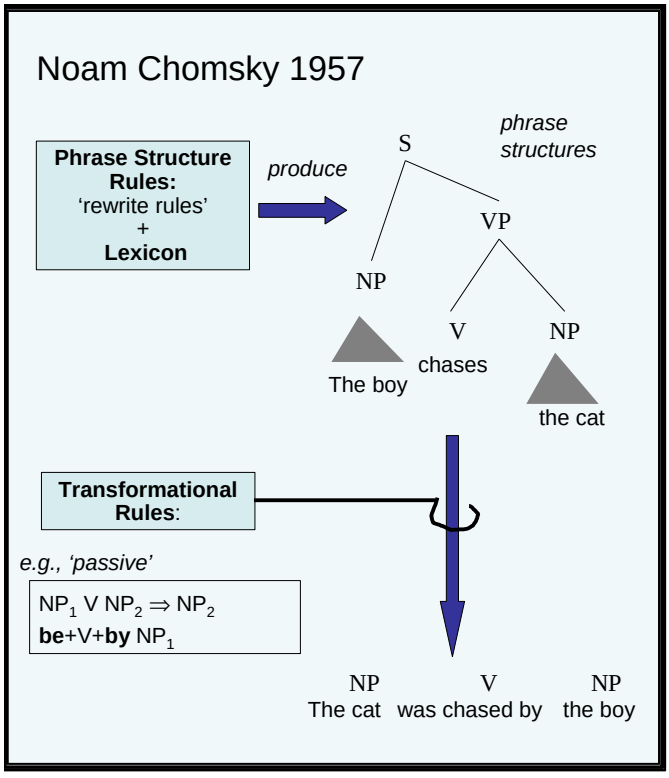
With this rule, we are saying that trees can be built where any N node in the tree (i.e., any noun) can be expanded ('rewritten') as one of the nouns specified. In theory, might want to have a rule with *all* the nouns of a language—but since this would obviously be a rather long rule to write, we commonly talk of a **lexicon** instead. The simplest view of a lexicon is as a list of words, like a dictionary, with particular information attached to each entry. For syntax, the least information that should be present is the grammatical category. So if we take the rule above and write this instead as a small lexicon, it would look as follows:

dog	N
boy	N
gnome	N

This is exactly equivalent to the rewrite rule given above. It is not, however, very interesting by itself and usually considerably more information is placed in the lexicon with each word—this again leads to the area of **lexical semantics,** that has the meaning of words as its main concern.

With phrase structure rules we are to subsume a considerable amount of linguistic variation under a single rule—and this is precisely their purpose: rather than describe individual structures, we can instead make very general statements about the *kinds* of linguistic structures that are possible. Rather than resort to examples standing in for linguistic generalizations, or as Edward Sapir wrote in 1921: "One example will do for thousands, one complex type for hundreds of possible types", we can describe those thousands *directly* by saying how they can be built, or **generated**. This had already become an aim of linguistics in the 1950's (as we see in the citations from Hockett and others in Chapter 2 and below), but it had remained completely unclear how it might possibly be achieved.

The rewrite rule, together with Chomsky's other main contribution at that time, the *transformation*, was the first convincing indication of how it might be done. In Chomsky's model from 1957, the basic structures of a language are produced directly by a collection of rewrite rules and then these could be further extended by defining rules that could turn, for example, an active sentence into a passive sentence, or a positive sentence into a negative sentence. Notice how this corresponds very directly to our strategy for dealing with complex structures produced by interpersonal and textual meanings in Chapter 8: the phrase structure rules give the simple constituency structure, and then the *transformations* could 'distort' or strain these as necessary. The use of such rules was then the beginning of the prominent direction in linguistics still known as **generative grammar** which had a very significant effect on linguistics for over two decades.



A grammar rule such as

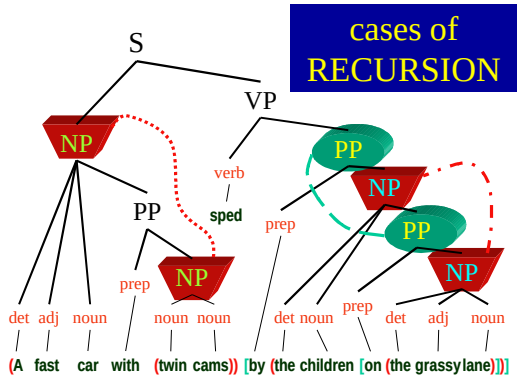
$$NP \rightarrow NP\ PP$$

whatever its merits or otherwise, also gives an example of the very special kind of embedding called 'recursion' mentioned earlier in our introduction to syntactic structure. Recursion is when a phrase may contain another phrase of the same kind within it: in this case, a NP can include a NP. Note how we can see this very clearly in the rule itself as a grammatical category appears *both* on the right-hand side and the left-hand side. This is important because it opens up the grammar so as to be able to produce not only 'thousands' but, in theory, an *infinite* number of structures: an NP can include an NP can include an NP etc. Recursion is the basis of such words games as:

> This is the wolf that chased the dog that frightened the cat that chased the mouse that ate the cheese that came from the house that Jack built.

But recursion is also the basis of the fundamental property of human language that no matter how complicated a meaning we have to express, there will always be a way of covering that meaning grammatically.

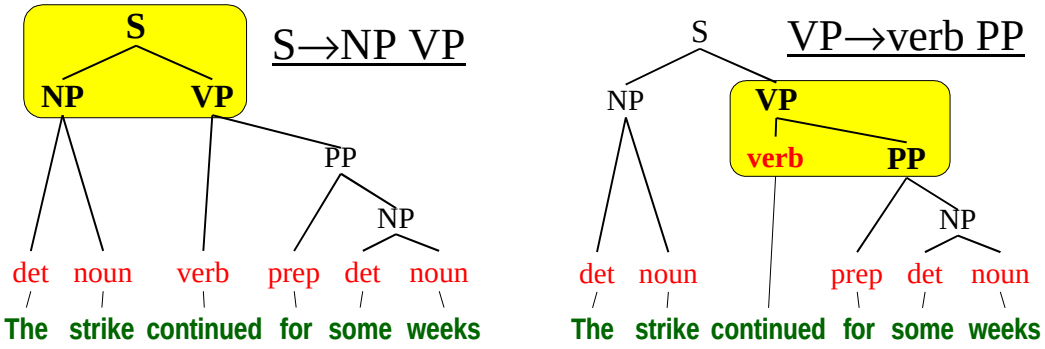
That is, the grammar will not 'run out of steam' halfway and only be able to produce, for example, two PPs, or three NPs; there is always the possibility of having more if the meaning requires it. We mentioned this fundamental property of human language in the previous chapter and now, with rules, we have a way of explicitly stating how this can be.



The nodes illustrating recursion are shown in the tree on the right, which shows quite a complicated sentence structure that we will return to below. Rewrite rules directly involving recursion are quite simple to recognise: they simply have on their right-hand side an occurrence of the type of label that appears on the left-hand side. Many cases are more complex, however, in that the recursion comes about indirectly, as in the tree above. Here there is recursion because the PP has an NP which has a PP in it. We can only see this from the rewrite rules by considering what happens when we combine them: i.e., is it

possible to go round in circles in their application—apply the NP rule, then apply the PP rule, then apply the NP rule (again), and so on.

In general, it is crucial to realise that the tree structures and the phrase structure rules are very intimately related. Given any rule, we can say what bits of phrase structure tree are possible; and given any bit of tree, we can say what rules are necessary to produce that tree. This is illustrated in the diagram below. The rules corresponding to, or rather **licensing** two particular nodes in the tree are shown highlighted.



A tree is only really well-defined with respect to a given body of rules: and a body of rules is called a **grammar**. This is why it does not really make so much sense to ask whether a tree is 'correct' or not: we need to say correct with respect *which grammar*. Each node of a tree must be **licensed** by some rule in a specified grammar. Only when this has been done can we know completely explicitly what our tree diagrams are representing and also how we are allowed to draw them.

This is the way in which modern linguistics has sought to go beyond the collection of various structures as needed to describe the sentences that are encountered in a language. Not only do we need to describe the sentences that occur, we also need to relate these (and only these) sentences to a general grammar that can produce them.

We must then be able to follow this connection between rules and syntactic trees. We need to be able to say which trees follow from a given set of rules. We also need to be able to judge whether some tree is allowed by a set of rules or not. This is part of the stage of testing, verifying and possibly falsifying a theory of structure. Only when we can do this

can we take the next important step: that of *changing* the rules so that they do a better job of describing the language they are intended to cover: i.e., of developing new theories that do a better job of describing the linguistic facts. It was this ability to link rules and trees in a clear and unambiguous fashion that allowed the development of the linguistic understanding of syntax to scale completely new heights. Previous general tendencies and observations were replaced by a far deeper view of the basic stuff out of which language is made: **structure**.

This development has steadily revealed not only more of the complexity inherent in language structure but also more of the regularities; modern grammars contain very general statements that apply both to a wide range of syntactic and semantic phenomena that were previously considered to be unconnected or lacking in pattern and to a wider range of languages. This has allowed linguists, for the first time in the long history of linguistics, to ask questions about a language system as a whole, about the properties that an entire grammar for a language must possess in order to work, and to move us beyond the study and collection of individual constructions.

Since the groupings that occur in language are there for a purpose, it is not the case that the kinds of phrases that we find necessary in grammatical rules and, consequently, in syntactic trees, are arbitrary or random. The phrases described should always correspond to some meaningful grouping. To apply the semantic 'reality check' of the previous chapter, it should be possible to find some sensible semantics for each node in the tree. Moreover, the *relations* between phrases in a syntactic tree should also correlate to some aspect of their meanings. A precise syntactic tree can therefore make explicit **ambiguities** in the meanings of sentences. Consider, for example, the following sentence.

The dwarf saw the gnome in the garden

We can try to build a structure for this sentence following the syntactic rules that we have seen so far with one small addition. For convenience we group the relevant rules together here, giving our first grammar. It has six rules:

1. S → NP VP

2. NP → det N
3. NP → NP PP
4. VP → verb NP
5. VP → verb NP PP
6. PP → prep NP

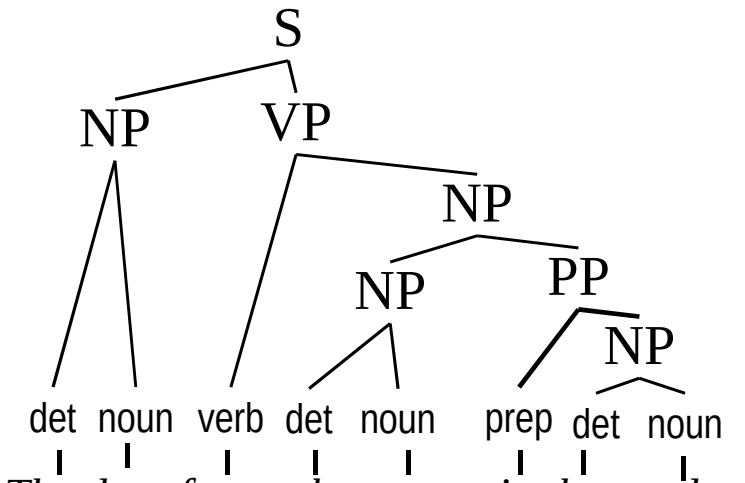
This grammar illustrates that it is not necessary that there is only one way of constructing a phrase: there can be alternatives. Thus rules (4) and (5) show that there are two possibilities for a verb phrase, one with a prepositional phrase and one without. This is necessary because, as we have seen, not all sentences have Circumstances. Both the sentences,

> John ate a cake.
> John ate a cake in the kitchen.

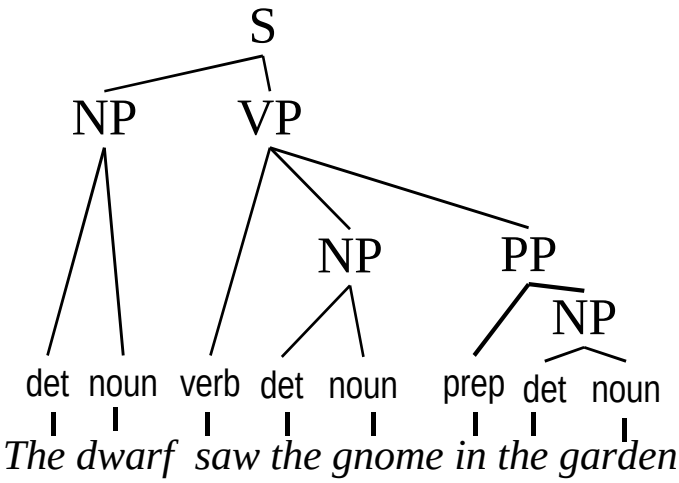
are acceptable English. A notational abbreviation that is often used in phrase structure is to combine such rules into one and to mark the element that appears in one rule but not in the other as **optional.** This optionality is indicated by enclosing the optional element in brackets; thus rules (4) and (5) could be rewritten as the single rule:

4′. VP → verb NP (PP)

It is the existence of alternatives of this kind that leads to the possibility of ambiguity: both structural, in that more than one syntactic tree is possible, and functional or semantic, in that the different syntactic trees lead to more than one interpretation of what the sentence could mean. For our sentence above, for example, we should be able to recognise the various grammatical ‘chunks’ without too much difficulty: we have three NPs ‘the dwarf’, ‘the gnome’, and ‘the garden’ and a PP ‘in the garden’. But how are these constituents to be put together? One possible tree uses rules (1), (2), (3), (4) and (6) to produce the tree:



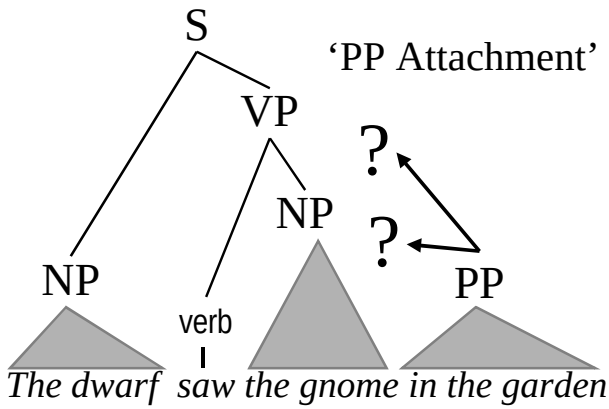
But this is not the only possible way to use the rules of the given grammar in order to construct a tree that fits with the sequence of words that make up the sentence. In particular, we could also consider using rule (5) which allows us to attach a prepositional phrase directly to the verb phrase. This would give the following tree:



The only difference between the two trees is where the prepositional phrase 'in the garden' has been **attached** to the rest of the tree. But this difference is *not* an artificial one that is caused by our rules. It corresponds to a genuine ambiguity in the possible meanings of the sentence: was it the gnome that was in the garden or was it the event of seeing that was in the garden? We can bring out these two meanings by adding some more detail: e.g.,

> The dwarf in the park saw the gnome in the garden by using a powerful telescope.

In this sentence, it is likely that the seeing takes place where the 'see-er' (the dwarf) is, that is, in the park, and so description 'in the garden' must refer to the gnome—i.e., it is the gnome in the garden that the dwarf sees (while in the park). The two different meanings correspond to different structures. This problem of so-called **PP-attachment** is a general source of ambiguities in sentences: since the grammar of English (and many other languages) allows PPs to occur in both NPs and VPs it is not always clear which is meant. This is shown in the diagram to the right; here we also make use of a common notation found in syntax trees: when some details of structure are not relevant to the immediate point being made in a discussion, we can blank them out in shaded triangles so as to focus the attention of the reader. Here the internal structure of the NPs and PP is not at issue, it is where the PP is to be attached that is important.



This can also be shown to be more than a so-called 'artefact of the description'; that is, it is not simply because we have to write the trees down somehow that this kind of forced choice is created. Many studies in the area of **psycholinguistics** investigate with psychological experimental methods the kinds of processing language using subjects employ during language understanding. These experiments can reveal, for example, when, and under what conditions, subjects need to do relatively more processing. Cases of PP-attachment trigger this kind of effort, which is therefore revealed to be 'real': at least as far as our brains and their processing of language is concerned.

The uncertainty in attachment shown here is also the source of many misunderstandings as well as intended double-meanings as found in jokes such as the following alleged advertisement:

> For sale: mixing bowl set designed to please cook with round bottom for efficient beating.

The serious point here is that syntactic structure and meaning go together: as we saw suggestively in our first introductions to phrase structure and more technically in Chapter 8, if there are different syntactic structures, then there are also different meanings. Making sure that you can find alternative structures when they are there, and *not* find them when they are not there, takes some practise but is a necessary skill to develop. Being able to follow systematically the consequences of your statements makes it more likely that logical inconsistency will be avoided and also provides the tools for probing deeper to give more revealing analyses.

Here are some further ambiguous sentences with their structures shown with labelled brackets. Remember that these labelled bracket expressions are exactly equivalent to syntactic trees and you should be able to draw the trees corresponding to each of these examples. In each case it is the attachment of a PP that causes the difference. The effect is not always humorous—sometimes it just results in an unclear sentence.

- We will sell gasoline to anyone in a glass container.

  $[_{S}\ [_{NP}$ We] $[_{VP}\ [_{verb}$ will sell] $[_{NP}$ gasoline] $[_{PP}$ to anyone] $[_{PP}$ in $[_{NP}$ a glass container]]]]

  $[_{S}\ [_{NP}$ We] $[_{VP}\ [_{verb}$ will sell] $[_{NP}$ gasoline] $[_{PP}$ to anyone $[_{PP}$ in $[_{NP}$ a glass container]]]]]

- A fast car with twin cams sped by the children on the grassy lane

  $[_{S}\ [_{NP}$ A fast car $[_{PP}$ with twin cams]] $[_{VP}\ [_{verb}$ sped] $[_{PP}$ by $[_{NP}$ the children]] $[_{PP}$ on $[_{NP}$ the grassy lane]]]]

  $[_{S}\ [_{NP}$ A fast car $[_{PP}$ with twin cams]] $[_{VP}\ [_{verb}$ sped] $[_{PP}$ by $[_{NP}$ the children $[_{PP}$ on the grassy lane]]]]]

The different structures give rise to different meanings. In the first example the question is whether the anyone to whom gasoline will be sold is in a glass container or not; in the second example, the question is whether it is the children or the car that is on the grassy lane.

Although the rules of English (and many other languages) allow a great deal of flexibility in how phrases are put together, they do not allow just any combination: if they did, then we would not need a grammar. So the following example that we have seen before as a candidate of a sentence that might have been thought to be ambiguous and which actually is not:

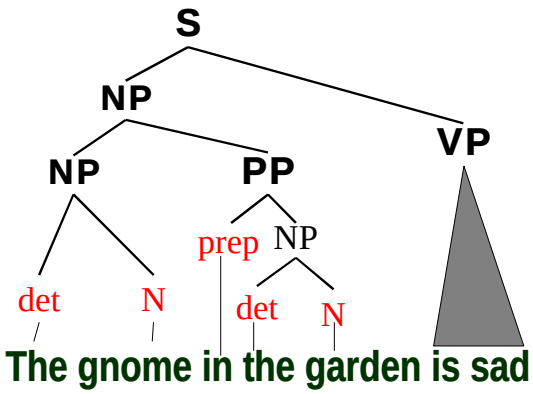
The gnome in the garden is sad.

can be readily ruled out by the appropriate phrase structure grammar. As we saw in Chapter 8, if we think solely of Processes as the action involved, Participants as those involved centrally in the action, and Circumstances as locations where the action occurs, then we might, *quite wrongly*, produce an analysis like the following that we criticised above:

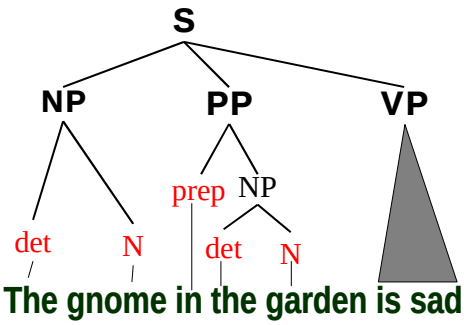
The gnome	*in the garden*	*is sad*
Participant	Circumstance	Process

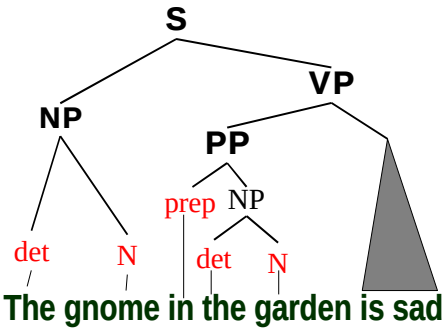
Such an analysis is wrong in two respects: first, it suggests a structure that does not exist in English and, second, it suggests a meaning that is not the meaning of the sentence.

This sentence does not express that it is “in the garden” that the being sad occurred: it simply makes a statement about a particular Participant—and that Participant is “the gnome in the garden”. This can almost be produced straightforwardly by our little set of grammar rules given above; the only complication is the fact that we have a different type of clause here, one that is attributing a property to some participant. This involves a different verb phrase, one where there is a verb (typically but not always the verb ‘to be’, also called the **copula**) followed by an **adjectival phrase**. We will leave this detail out of the structure for present though giving a tree like this:

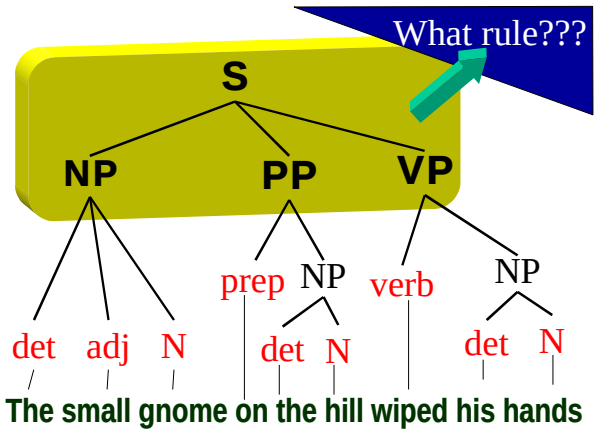


As we will show in more detail in the sections following, this structure is only compatible with a meaning where there is a single Participant—"the gnome in the garden"—and the sentence assigns a property to this Participant, that of being sad. If we were to try to associate the being in the garden with the Process, which would be what is necessary to make it into a Circumstance, then we would need a structure more like one of the following two:





But neither of these structures are supported by the grammar as given. We do not have any rule that lets us expand an S node into an NP, PP and VP in that order; nor do we have any rule that lets us expand a VP into something that begins with a PP. This is for a good reason: these are not structures that occur in English: in fact, we cannot interpret the sentence as one in which the 'in the garden' is related to the being sad. We can bring out this contrast by producing a sentence which our grammar *can* produce: i.e.,



The gnome is sad in the garden.

Here we have a straightforward VP ending with a prepositional phrase as we have often seen above. A believable follow-up to a statement such as this would be that the gnome should perhaps go somewhere else, then he would not be sad. This demonstrates that the garden and the being sad are indeed brought together in this sentence; no such follow-up would come to mind in the case of the previous sentence used above.

This applies for all similar structures. For example, in the sentence:

The small gnome on the hill wiped his hands

it is not immediately obvious perhaps from the meaning whether the constituent 'on the hill' is to be linked to the 'gnome' or the 'wiping'. But the structure tells us; any attempt to link with the verb would not be sanctioned by our grammar. Since the grammar does not allow this but *does* allow a straightforward linking with the 'small gnome' we can assign our structure accordingly. This, as we will see, lets us straightforwardly decide what and what not are Participants or Circumstances.

Thus, a useful grammar is ***constraining***: it tells us what structures are possible and leads us away from impossible combinations. This is one of the aims of a good grammar. It should cover a wide range of the possible structures of a language, but also rule out those which are not possible. A grammar that produces sentences that are not acceptable is said to **overgenerate.** A good grammar should not overgenerate, but it should also not **undergenerate,** i.e., it should still let us describe the structures that *do* occur. Although meeting these requirements is difficult, the results are well worth aiming for. Another important aim for a good grammar, one which we will now turn to in the next chapter, is that the grammatical structures produced should make it easier to work out the meaning of any sentence: that is, syntactic grouping should correspond in some way to semantic grouping.

The notion of 'generativity' here became a central one in linguistics after it was introduced into the linguistic mainstream by the early work of Chomsky in his transformational model that we saw above. For many,

linguistics is still essentially *generative linguistics* if it is to be considered interesting. While we do not share this view at all here, it is necessary to be aware of it. It is perhaps a natural development in the style of linguistics that took 'prescriptivism'—i.e., saying what is allowed and what not—to the logical limit.

> "A grammatical description must be a guidebook for the analysis of material in the language—both material examined by the analyst before the description was formulated, and material observed after that. [...]
>
> The description must also be prescriptive [...] in the sense that by following the statements one must be able to generate nay number of utterances in the language, above and beyond those observed in advance by the analyst—new utterances most, if not all, of which will pass the test of casual acceptance by a native speaker." (Hockett, 1954:232).

This view was taken up in force by Zelig Harris, another famous name from the immediate 'pre-Chomsky' period and of whom Chomsky was a student:

> "The work of analysis leads right up to the statements which enable anyone to synthesize or predict utterances in the language." (Harris, 1951: 372)

This is a very enticing carrot. If we think back to our description of the empirical cycle in Chapter 3, here we have the ultimate in prediction: linguistic theory was seen to be on the verge of actually predicting what utterances can be made in a language and which not. This was a very new development—one which could not be matched in the previous long history of linguistics.

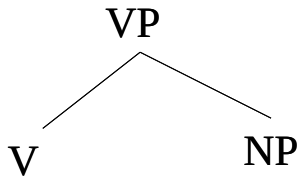
Of course, the strong view of prediction has to be considered rather carefully here. There are too many variables involved to predict what any particular speaker will say in any particular situation. Where the strong predictive nature of the account has been extremely valuable, however, is in the ability of a model to be precise enough to make *wrong* predictions—this was also not possible before. For the first time, a linguistic account could be shown to be simply wrong, rather than a matter of opinion. This is the hypothesis-testing-rehypothesis cycle that has led to enormous

developments that we have seen since 1960 in linguistic description.

9.2 The connection between rules and meanings

We can now also bring in our discussion of semantics from Chapter 8. We saw there that the phrase structure served to give instructions for constructing semantics. We suggested that that particular phrase structure tree configurations went together with particular 'instructions'. These were written in terms of semantic interpretation rules. Given a particular configuration, the semantic interpretation would tell us how to combine the meanings of the parts to get the meaning of the whole. The step to relating syntactic rules to semantics is then a simple one.

A 'tree configuration'—such as, for example, a S made up of an NP and a VP—is actually *just another way of writing a phrase structure rule.* That is, we can write a tree configuration in the way we were doing when we were analysing sentences:



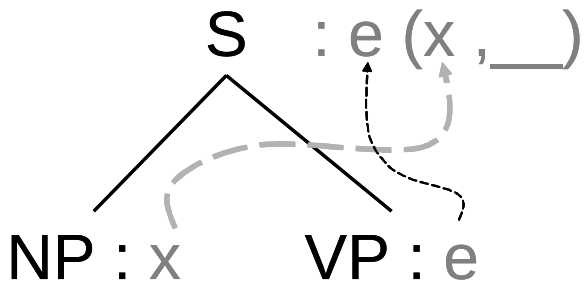
But we can also write this tree configuration just as well as the phrase structure rewrite rule:

$VP \rightarrow V\ NP$

The same is captured in both cases .The point of the rewrite rule is that it simply emphasises the fact that we can 'generate' as many tree configurations as we like; we are not just describing one tree, but *one possible kind* of tree.

So, given this connection between tree configurations and rules, we can similarly convert our semantic interpretation rules into phrase structure rules that *include* semantics.

This goes as follows.



First, consider again one of our semantic interpretation rules from Chapter 8, the rule for composing the parts of a sentence to make a meaning for the whole:

S interpretation

Now, we express the tree configuration part of this diagram as a rewrite rule, thus:

S → NP VP

and finally we *add in* the semantic parts as additional information associated with each part of our grammar rule. We can write such additional information in brackets underneath the constituent to which it applies, like this:

S	→	NP	VP
[e (x, __)]		[x]	[e (__ , __)]

As before, the "__" indicates empty spaces in the semantics that will be filled in by other rules of interpretation. Reading the entire rule, we now have the following instructions all neatly combined:

1. Build a grammatical sentence (an S) by taking a grammatical verb phase (VP) and a grammatical noun phrase (NP) and putting them one after the other
2. Build the semantic interpretation of the sentence by taking the event associated with the VP and the object associated with the NP and combining them in the way shown for the S.

Naturally this can become much more complicated with more complicated sentences. But the essential idea remains the same. Writing our rules like this captures the central idea of compositional semantics and tells us exactly how to put meanings together. The basic mechanism that is most commonly used for putting together the individual parts of semantic information to

get bigger or more explicit pieces of semantics is called **unification.** That is, we *unify* the component parts in order to get bigger parts.

Unification is one of the most important mechanisms used in modern linguistics and can make linguistic descriptions very much simpler, while at the same time describing very much more of language. Unification is also very important in **computational linguistics** because it is possible to spell out the mechanism sufficiently explicitly for computers to be able to perform it automatically. A more detailed description of unification must wait for later, more advanced courses however.

For now it is enough to know that rules correspond to fragments of trees, that the rules determine which trees are allowed and which not, and that we can associate semantic information with rules in order to get our semantic interpretations done. That is already quite a lot.

Reading and references

Chomsky, Noam (1957) *Syntactic Structures*. Mouton.

Harris, Zellig S. (1951) *Methods in Structural Linguistics.* Chicaco: Chicago University Press. (Reprinted as *Structural Linguistics*, 1960).

Hockett, Charles F. (1954) 'Two models of grammatical description'. *Word* **10**: 210—231.