Chapter 4
The structure of sentences: syntax

4.1. Introduction: rules and grammar

When people speak or write they do so usually in strings of words that are not arbitrary in their sequence. That is, we cannot form sentences by adding just any word to any word preceding it. And speakers of a language have rather clear intuitions about what is a possible string of words in their language, and what is not. For example, we know that the sentence in (1a) is a possible English sentence, while the sentence in (1b) is an impossible sentence.Following the usual conventions in linguistics, I mark impossible sentences by an asterisk:

(1) a. I don't like getting up early.
b. *Up earlyn't getting do like I.

Likewise, in (2) speaker B may answer the question posed by speaker A in various ways, but not in others. Consider the answers in (2a-h):

(2) A: Where did Jane put the stupid key for the garage?
a. B: I have no idea.
b. B: No idea.
c. B: Right there.
d. B: On the shelf.
e. B: I said it's in the closet.
f. B: *Have no.
g. B: *Shelf the on.
h. B: *Key in closet.

The answers (2f), (2g), and (2h) are not possible. Of the possible answers, (2a) and (2e) are full sentences, while (2b), (2c), (2d) are not. We see that the possible answers to the question can consist of a full sentence, or only a part of a sentence. The impossible answers in (2f), (2g) and (2h) show, however, that not just any part of a sentence is an acceptable answer. What is it then that makes a given string of words acceptable or unacceptable? First of all we need to realise that the impossibility or unacceptability of the answers is not really a matter of meaning or logic. While (2f) might be practically uninterpretable, the order of words in (2g) would be grammatically perfect and the

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answer fully comprehensible in other languages (e.g. Japanese). Hence, it seems that the interpretability of a given sentence depends on the types of rules that a given language provides. And even sentences that clearly violate these rules can be interpretable, as is the case with (2h), which, though certainly not in accordance with the rules of English grammar, is still meaningful for speakers of English. The reason why speakers of English don't like the starred sentences from above is because of grammar: we consider them 'ungrammatical', i.e. not in accordance with the grammatical rules of English. Obviously, these rules are concerned with the structure of sentences, i.e. their **syntax**.

Syntax is usually considered the core of a language's grammar, but what exactly do people mean when they speak of **grammar**? There are two important senses of the word 'grammar' that we should be aware of. In linguistics, the term 'grammar' refers to the complete system of phonological, morphological, syntactic and semantic information and rules that speakers of a given language possess. As you have already seen in the previous chapters, language is a very complex, well organised system of abstract entities and categories, and their realisation in speech. This system, or the speaker's tacit knowledge thereof, is called the 'grammar' of a language.

This scientific meaning of 'grammar' differs substantially from the everyday usage of the term you might be familiar with. In everyday language, 'grammar' simply refers to a special kind of book. And in this book one finds rules which one needs to obey in order to use a particular language correctly. Grammar books are not meant to be entertaining and are usually consulted (rather than read) if one is not sure about how to use a particular word or expression. In other words, the grammar book contains a description of the system of rules referred to by linguists as 'grammar'. The important point now is that, given the complexity of human language, the grammar book can only be an incomplete representation of the language system in question, i.e. an approximation of the vast knowledge that speakers actually have. As a natural consequence, many rules that one finds in grammar books can be shown to be not quite adequate, or simply wrong, since they are not in accordance with the reality of the language. Unfortunately, this is especially true for rules in grammar books that are written for less advanced second language learners. The reason for this state of affairs is that — for mainly didactic reasons — these grammars simplify the intricacies of pertinent rules considerably. Let us look at an example for illustration.

In a number of school grammar books for German learners of English, we find the rule that in a sentence with more than one expression of manner, place and time, expressions of manner should precede expressions of place, which

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in turn should precede expressions of time. This is encapsulated in the phrase 'manner before place before time' that many German learners of English memorise in their school lessons. A careful analysis of large numbers of naturally occurring sentences reveals, however, that this alleged 'rule' is more often violated than observed by native speakers of English. Native speakers are in fact much more inclined to place shorter expressions before longer ones, irrespective of their meaning (cf. Hawkins 1999). The inadequacy of the manner-place-time rule can be illustrated with a few sentences that do not obey the would-be rule but are nevertheless in accordance with English grammar (i.e. the language system):

(3) a. As promised,
Joan met me at noon in the dark and terribly crowded station.
time **place**

b. Jaye played soccer last night like an Italian defender.
time **manner**

How can we deal with the fact that native speakers do not follow the alleged rule? Tell the native speakers that their grammar (i.e. their language system) is wrong? Certainly not, since we can assume that native speakers have successfully internalised the real rules of their language. Furthermore, native speakers of English are quite uniform in not following the alleged rule, and employing instead a different strategy (roughly 'short before long', all other things being equal). Hence, the native speaker's rule-system is right, and the grammar book (or rather: its author) is wrong. We have to state that the manner-place-time-rule is not a rule of English. It may exist in grammar books and may be taught to German learners of English, but it does not exist in the minds of English native speakers and has nothing to do with the reality of the language. In general, it is the task of the linguist to describe this reality, and not to think up ill-founded rules and impose them on others.

To summarise, the authors of grammar books can only attempt to describe the language system, and they often fail to do so adequately, due to the complex nature of the language system, or due to their lack of expertise as linguists, or due to their desire to simplify matters for didactic purposes. Users of grammar books should therefore be very careful citing such books as evidence for what is 'correct' or 'incorrect' in a language.

Having clarified the notion of grammar, we may now return to our subject matter, the syntax of English, to see how sentences in this language are struc-

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tured. What does it mean that a sentence has 'structure'? The *Oxford English Dictionary* defines 'structure' generally as an "organised … combination of mutually connected and dependent parts or elements" (s.v. structure). The study of syntax is thus the investigation of the parts sentences consist of and their connections and dependencies. There are many theories of syntax around, with a lot of theoretical and technical apparatus. In this chapter we will largely ignore individual theories and instead try to get a feel for syntactic argumentation, i.e. the kinds of reasoning that can be adduced in favour of or against particular syntactic analyses. This will prepare the reader for the study of the more specialised syntactic literature.

In the following sections, we will first look at the building blocks of sentences and their internal structure, then turn to the functions of these structural units and finally discuss how the structural and functional levels of analysis can be related to each other.

4.2. The building blocks: words and phrases

4.2.1. Constituency tests and phrases

Let us start with the analysis of a rather straightforward sentence, and ask ourselves what parts or structural units we can detect that can combine to form the kind of 'organised combination' mentioned above. We will start our discussion by investigating the sentence in (4):

(4) Many people will go to the station every morning.

Simply using our intuition we might say that each word is a kind of building block for this and certainly many other sentences. The fact that in writing we use spaces between words is a reflection of that intuition. In addition to the words, you would perhaps also want to say that [*Many people*] belongs together and thus forms a structural unit, that [*to the station*] belongs together, and that [*every morning*] is also a larger structural unit within the sentence. In analogy to structural units in phonology and morphology, we will call syntactic units **constituents**, or, in more syntax-specific terminology, **phrases**. Obviously, words are also syntactic constituents, and we will later see that constituents or phrases may sometimes consist of only one word, for example a pronoun or a proper noun. In writing we use brackets to mark constituents. Returning to the analysis of (4), you may even hypothesise that [*will go*] might form a constituent, but that [*station every*] or [*people will*] are not constituents. We can represent our intuitions about this sentence in the form of a tree diagram. The tree in (5) shows us that, according to our hypotheses, the sentence

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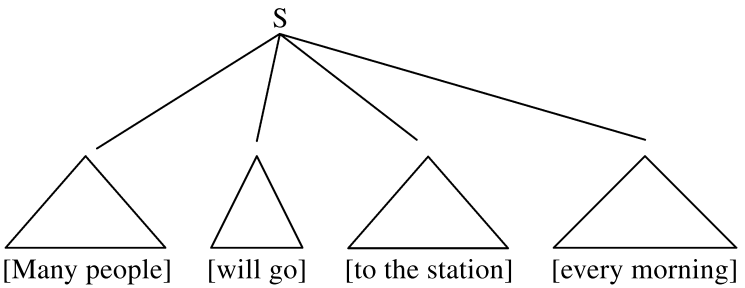
'S' contains four constituents which are all on the same level (for reasons of clarity we omit brackets around individual words inside larger constituents):

(5) a first tree diagram for [*Many people will go to the station every morning*] (to be revised as we go along)



Note that the tree diagram so far does not say anything yet about the internal structure of the phrases [*Many people*], [*to the station*] and [*every morning*], which, for that reason, are represented by simple triangles without internal branches. Before dealing with the internal structure of phrases let us first turn to the obvious question of what kind of evidence we can find to support our intuitions about the constituency of the sentence. Syntacticians have developed a number of tests that can be applied to sentences in order to prove constituent status, some of which we will now discuss.

The first is **pronominalisation**, that is the substitution of a constituent by a pronoun. The reasoning runs as follows: if you can replace a string of words by a pronoun, this string must be a constituent. This seems easy for [*Many people*] and [*to the station*], still possible for [*every morning*], but less so for [*will go*]. This is illustrated in (6), with the pronouns appearing in bold print:

(6) a. **They** will go **there** every morning.
b. They will go there **when**?
c. **When** will they go there?

In (6a) *they* pronominalises [*Many people*], and *there* pronominalises [*to the station*]. Note that these examples show us that the term 'pronoun', if taken literally as 'replacing a noun', is somewhat misleading. The pronoun *they* does not stand for a noun, but for the whole phrase, and can in fact not be used to stand for only the noun *people* in that phrase (cf. *[*many they*]). Similarly, the pronoun *there* does not stand for a noun, but for a larger phrase. And so does the interrogative pronoun *when*. It would therefore be best to rename pronouns as 'pro-phrases' or generally 'pro-forms'. While the term 'pro-phrase' is (unfortunately) not in use in linguistics, the term **pro-form** is, and

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we will therefore use it interchangeably with the established term pronoun, keeping in mind that a 'pro-noun' is actually a pro-phrase. Returning to our pronominalisation test, we can see that in (6b) and (6c), the string [*every morning*] is replaced by a so-called **wh-pronoun**. Given that these pronominalisations work perfectly, we have good evidence that [*Many people*], [*to the station*], and [*every morning*] are indeed constituents.

But what about [*will go*]? There is no pronoun that could replace those two words. Does that mean that [*will go*] is not a constituent? Not necessarily, because we cannot turn around the argumentation. If a test does not work for a putative constituent, this could be because it is not a constituent, but it could also be because of other, independent reasons. For example, it may be the case that for some kinds of constituents English simply does not have a pronoun. Hence we need additional tests that may substantiate constituent status. Only if we cannot find *any* test that gives positive evidence for the constituency of a given string, can we conclude that our string in question is really not a constituent.

Another such test for constituency is **movement**. If a string of words can be moved to other sentential positions, it is proof of the string's being a constituent. This test works nicely for [*to the station*] and [*every morning*], but not really for [*many people*] and [*will go*], as is illustrated in (7). The original position of the moved string is marked by a gap indicated by underscores:

(7) a. [To the station] many people will go ___ every morning.
b. [Every morning] many people will go to the station ___.
c. *___ will go to the station [many people] every morning.
d. *[Will go] many people ___ to the station every morning.

In the case of [*many people*], we can see why movement is impossible. [*Many people*] is the subject of the sentence, and the sentential position of subjects in English is severely restricted, in that they generally occur before the verb complex. Hence, although we have already good evidence that [*Many people*] is a constituent, there is an independent reason, i.e. a rule for subject position, that precludes successful application of the movement test. Note that the string *will go* fails this constituency test, just as it failed the pronominalisation test. Hence, there is no evidence so far that this string forms a constituent.

A third test is the so-called **coordination test**, according to which it is only constituents that can be coordinated by the coordinating conjunction *and*. This conjunction has the wonderful property of combining only constituents of the same kind. Such constitutents can be simple words (cf. *black and white*, *night and day*, *twist and shout*, *up and down*), but also phrases, as illustrated in (8):

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(8) a. [[Many people] and [my friends]] will go to the station every morning.
b. Many people will go [[to the station] and [into the woods]] every morning.
c. Many people will go to the station [[every morning] and [every evening]].

So, if we can coordinate two expressions with *and*, this is good evidence for their being constituents. The coordination test can even show us that there is yet another constituent detectable, [*go to the station every morning*]:

(9) Many people will [[go to the station every morning] and [come home at night]].

That [*go to the station every morning*] is a constituent can be further substantiated by pronominalisation. English has a pronominal phrase that can replace constituents such as [*go to the station every morning*], namely [*do so*]:

(10) Many people will **do so**.

Our analysis of [*go to the station every morning*] as a constituent is further corroborated by the behaviour of this string when we add a tag question:

(11) Many people will [go to the station every morning], won't they ___?

The tag question leaves a gap, in which we could insert the missing string [*go to the station every morning*]. This **gapping** behaviour is a fourth kind of test, which works with certain types of phrases. Surprisingly, the coordination test can also be applied to [*will go to the station every morning*], as in (12):

(12) Many people [[will go to the station every morning] and [may stay there until 10 p.m. every night]].

This shows us that even this very large string forms a structural unit.

Finally, there is the so-called **sentence-fragment test**, which brings us back to the discussion of possible answers to the question in (2). We saw that only certain types of string can form possible sentence fragments which speakers can use to, for example, answer a question. If we apply this test to the constituents in our sample sentence (4), we could, for example, answer the questions in (13) with the respective sentence fragments given in (14). This provides good evidence for their being constituents.

(13) a. Who will go to the station every morning?
b. Where will many people go every morning?
c. When will many people go to the station?
d. What will many people do?

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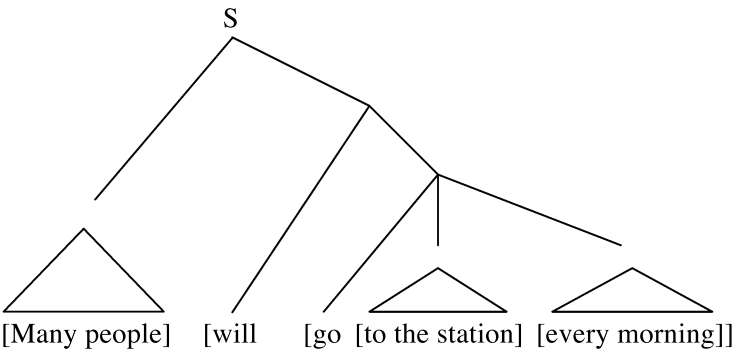
(14) a. [Many people].
b. [To the station].
c. [Every morning].
d. [Go to the station every morning].

Let us summarise our findings so far. We have found good evidence for the following constituents:

(15) [Many people]
[will go to the station every morning]
[go to the station every morning]
[to the station]
[every morning]

We did not find empirical evidence for our hypothesis that [*will*] and [*go*] together would form a separate constituent (in spite of the fact that your school grammar books may have suggested just that). We did find evidence, however, that [*will*] forms a constituent together with [*go to the station every morning*]. This means that we have to revise our tree diagram accordingly:

(16) revised tree diagram for [*Many people will go to the station every morning*]



We can now see graphically that the sentence consists of two major constituents, represented by the two lines branching off the top node 'S'. The right one of these two branches splits up further into two constituents, of which again the right one splits further into three constituents. Before we turn to the more detailed investigation of the internal structure of phrases, we should apply our tests to another sentence in order to see how the kind of syntactic reasoning developed so far works on another example. Take a look at the sentence (17) and set up some hypotheses about which strings of words might

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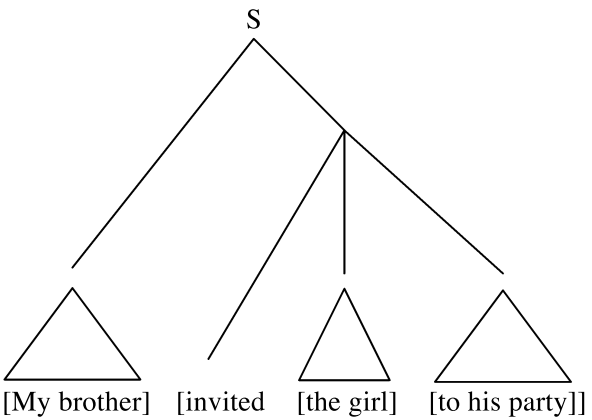
form a constituent. Before reading on, try to apply pronominalisation, movement, and coordination tests to test whether your hypothesis about the constituency is correct:

(17) My brother invited the girl to his party.

[*My brother*] can be replaced by *he*, [*the girl*] can be pronominalised by the personal pronoun *her*, [*to his party*] can be coordinated with a similar phrase, as in [[*to his party*] *and* [*to the excursion*]], and [*invited the girl to his party*] can be pronominalised by [*did so*]. Thus, we arrive at the following tree diagram:

(18)



Now consider (19), which is a somewhat more complicated case:

(19) My sister will read the letter to John.

The application of our pronominalisation tests may first look straightforward. The status of [*my sister*] is uncontroversial, we can easily pronominalise this string by *she*. The string [*read the letter to John*] is also uncontroversial, it can be pronominalised with [*do so*]. The string [*will read the letter to John*] may be coordinated with, for example [*may regret it afterwards*], and is thus also a constituent. But what about *the letter to John*? Two possibilities suggest themselves. Under one interpretation of the sentence, this string refers to a letter that is directed to John, and this letter will be read by the speaker's sister. There is, however, also another interpretation, according to which it is my sister's reading of the letter (and not the letter itself) that is directed to John. In the second case, we could pronominalise *the letter* with the personal pronoun *it* or the wh-pronoun *what* and get the appropriate interpretation:

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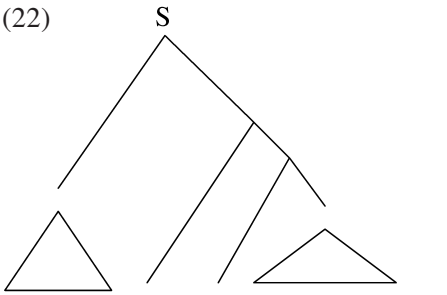
(20) My sister will read *it* to John.
What will my sister read to John? — The letter.

If, in contrast, it is a letter addressed to John that is being read by my sister, [*the letter to John*] forms a constituent, as evidenced by the pronominalisation test, in which [*the letter to John*] is replaced by *it* or *what*:

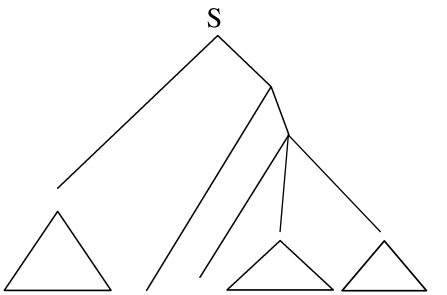
(21) My sister will read *it.*
What will my sister read? — The letter to John (not the e-mail from Jane).

The two interpretations with their respective constituency can be made visually more transparent by drawing tree diagrams. The respective interpretations are given in the third line below the trees in (22):

(22)



My sister will read *it.*
'the letter is directed to John'



My sister will read *it* to John.
'the reading is directed to John'

The tree diagrams bring out the crucial structural difference between the two interpretations. In order to describe the facts represented in the two tree diagrams, some more terminology is helpful. Thus we can speak of 'mother' and 'sister' nodes when describing relationships in a tree. A mother node is defined as the node immediately above a given node, and sister nodes are nodes that share the same mother node. Using these terms we can say that in the left tree, [*the letter to John*] forms a single constituent and is the sister node of the verb, while in the right tree [*the letter*] and [*to John*] do not form one constituent. Instead, they are two constituents sharing the same mother node with the verb and thus are sisters to each other and each of them is also a sister to the verb.

For obvious reasons, in cases in which different interpretations arise through different sentence structures assigned to the same strings of words, we speak of **structural ambiguity**. Having clarified how we can find consti-

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tuents in a sentence, we may now turn to the question of the internal make-up of multi-word constituents.

4.2.2. The internal structure of phrases

It seems that there exist different types of phrases, whose possible structures are somehow dependent on the most important word of the respective phrase. For example, in the phrases given below, the most important word is a noun, and the noun can be accompanied by certain types of words in certain positions. Have a look at (23):

(23) [his **sister**]
[their red-haired **brother**]
[a **letter** to John]
[the best **actor** in town]
[this good **student** from Washington]
[my last **friend** at school]
[**people** who knock on the door]

It seems that within a phrase certain types of words always occur in the same type of position. This becomes clear if we draw a table, as in (24):

(24)

slot 1	**slot 2**	**slot 3**	**slot 4**
his		**sister**	
their	red-haired	**brother**	
a		**letter**	to John
the	best	**actor**	in town
this	good	**student**	from Washington
my	last	**friend**	at school
		people	who knock on the door

There are four slots where certain kinds of elements can go. The central element of the phrase, the noun, is in slot 3, while slot 2 is optionally occupied by an adjective, and the first slot is occupied by an article (*the, a*), a demonstrative (*this*) or a possessive (*his, their*). Note that this slot can also remain empty, as for example in [*people who knock on the door*]. Slot 4 can either remain empty or may contain smaller or larger constituents.

We will call the most important element of a phrase its **head** and name the phrases after their heads. Thus, in (24) we have examples of **noun phrases** (abbreviated as 'NPs'), i.e. of phrases headed by a noun. As we can see in the following examples, other kinds of phrases have other kinds of head. The

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heads are given in bold, and the name of the phrase is given as a subscript label:

(25) a. [**to** the station]$_{PP}$
[**at** school]$_{PP}$
b. [**proud** of his results]$_{AP}$
[extremely **expensive**]$_{AP}$
c. [**go** to the station]$_{VP}$
[**drink** a glass of milk]$_{VP}$

Following the practice of naming the phrase after its head, we can say that in (25a) we find a preposition to be the most important constituent of the phrase, in (25b) it is an adjective, and in (25c) it is the verb. Hence we have two **prepositional phrases** (PPs) in (25a), two **adjective phrases** (APs) in (25b), and two **verb phrases** (VPs) in (25c). Our examples also show that phrases can contain other phrases. For instance, the VP [*go to the station*] contains the PP [*to the station*], which in turn contains the NP [*the station*].

But how do we determine whether a given word is 'the most important element'? What makes it 'important'? One answer to this question would be semantic, i.e. the head is semantically the most important element. For example, the prepositional phrase [*to the station*] indicates a direction or goal, and this meaning is chiefly contributed by the preposition *to*, and not by the NP following the preposition. This is evidenced by the contrast between the directional preposition *to* and the preposition *at*, which indicates a location (cf. [*at the station*]). Similar semantic arguments hold for other kinds of phrases and their semantically central heads. For instance, in the adjective phrase [*very proud of his results*]$_{AP}$ the adjective *proud* is semantically central, and in the verb phrase [*drink a glass of milk*]$_{VP}$ it is the verb *drink*.

The other crucial cluster of properties of heads concern their structural relation to the other constituents. Thus, in verb phrases and prepositional phrases the head assigns case to the constituent to its right, which is the reason why we find *him* instead of *he*, and *her* instead of *she* in (26):

(26) a. I saw *him*/**he* yesterday.
I met *her*/**she* yesterday.
b. This was a surprise for *him*/**he*.
This was a surprise for *her*/**she*.

Another indication for a word being the head of its phrase is that the head of the phrase, for example a noun, can have the same distribution as the phrase it heads. Having 'the same distribution' means that in all sentential positions

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where we can find a given phrase, we should also be able to find only the head of that kind of phrase. (27) illustrates this:

(27) a. [The two little **kids**] meet their friends regularly at the playground.
a.' [**Kids**] meet their friends regularly at the playground.
b. John meets [the two little **kids**] regularly at the playground.
b.' John meets [**kids**] regularly at the playground.

The final indication that a word is the head of a phrase is that the phrase obtains its semantic and syntactic properties from its head. This can be seen in pronominalisation: the noun phrase [*my older sister*] can only be replaced by the personal pronouns *she* or *her*, but not by *it*, *he* or *they*. This is a consequence of the properties of the head *sister*, which is an animate noun, has feminine gender, and is singular. These properties call for the pronouns *she* or *her*, and these properties do not come from the non-head words *my* or *older*. Syntacticians say that the head **projects** its properties onto the phrase as a whole (which is also the reason why phrases are often called **projections** of their head).

Talking about heads and their properties raises the question of how we know whether we are dealing with a noun, a preposition, an adjective or a verb as head in a given example. Most of us have learned in school that there are things like adjectives, nouns, verbs, prepositions. These classes are variably referred to as **word-classes**, **syntactic categories**, **parts-of-speech**, or **lexical categories**. But what exactly *is* a noun and what distinguishes a noun from, say, a verb, a preposition etc.? Before discussing in more detail the internal structure of phrases, we should take a closer look at those syntactic categories.

Of course one can look up the word-class of a word in a dictionary, but this shifts the problem to the dictionary-makers. How do they arrive at their decisions? And how can we tell whether the dictionary-makers are right in their decisions? And what about new words that have not yet made it into dictionaries?

Generally, there are three types of criteria that are used to find out about the word-class of a given word: semantic, morphological, and syntactic. We will discuss each in turn, starting with the semantic classification. In elementary schools it is quite common to introduce the word-class distinctions by pointing out that different types of words express different kinds of meanings. In this line of reasoning one would, for example, say that nouns refer to things or persons, verbs to actions or events, that adjectives express properties or qualities, and prepositions express relations. While this may seem intuitively attractive, a closer inspection reveals that the semantic approach to word-

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classes is not entirely satisfactory. Nouns like *love, production* and *restlessness* show that nouns can also refer to feelings, actions and properties, respectively, not only to things. And not all verbs seem to refer to actions or events, as the verb *seem* itself illustrates. What is even more disturbing for a primarily semantic approach to word-classes is the fact that we can quite easily determine the word-class of words whose meaning we don't know at all. Consider the following sentence:

(28) John gnorbed the pirkness only twenty pripless skirps ago.

I think most readers would agree if I said that *gnorbed* is probably a verb, *pirkness* is a noun, *pripless* is an adjective and *skirps* is a noun. If so, this is proof that you can determine the syntactic category of *gnorbed, pirkness, pripless*, and *skirps*, even though you have no idea what these words mean. And you cannot have any idea what they mean because I invented these words only a minute ago, with no idea in mind what they could mean. So how do we know the word-class? Here our two other kinds of criteria come into play, morphological and syntactic. Let us begin with the morphological ones.

We know that words of a particular category have a specific morphological make-up. Thus only verbs take the past tense suffix *-ed*, the suffix *-ness* is only found on nouns, the suffix *-less* is restricted to adjectives, and *-s* is a suffix that expresses plural on nouns. From this it follows that *gnorbed* is probably a verb, *pirkness* is a noun, *pripless* is an adjective and *skirps* is a noun. But, you might be tempted to say, how can we know that *gnorbed* is not an adjective, since there are also adjectives with the suffix *-ed*, such as *behead**ed**, long-hair**ed*** or *blue-ey**ed***? And how do we know that the suffix *-s* on *skirp* is a nominal plural suffix and not a third person singular *-s* suffix? These are very good questions, and they show that, solely on the basis of the morphology, *gnorbed* could indeed just as well be an adjective and *skirps* a verb.

What speaks strongly against such an analysis is, however, the position of these words in the sentence. This brings us to the syntactic criteria for word-class membership. Given *John* as the first element of the sentence, we expect it to be the subject of the sentence, which, in English, should be followed by the verb, which in turn should be followed by its object. Assuming *gnorbed* to be a verb is in accordance with this expectation, while *gnorbed* as an adjective would be in the wrong place. Independent evidence for *pirkness* being a noun comes from it being preceded by the article *the*, which is quite common for nouns in English. Positional considerations also support the analysis of *pripless* and *skirps*. Adjectives often immediately precede nouns and nouns often immediately follow adjectives. Furthermore, if *skirps* was a verb, it would be in the wrong place and the sentence would be ungrammatical. We

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can support our analysis also by substituting *gnorbed* by an adjective (e.g. *bad*) and *skirps* by a verb (e.g. *entertains*). Given that we think that such an analysis would be wrong we would predict that the substitution would lead to an ungrammatical sentence. This is indeed the case, as (29) shows:

(29) *John *bad* the pirkness only twenty pripless *entertains* ago.

Having established the notion of word-classes and the methodology of how to figure out the word-class of a given item, let us briefly look at the set of word classes and their major properties. We have already mentioned nouns, verbs, adjectives and prepositions, but there are more word-classes around: adverbs (e.g. *extremely, often*), articles (e.g. *a, the*), demonstratives (e.g. *that, these*), possessives (e.g. *my, theirs*), conjunctions (e.g. *and, because, that*), etc. For reasons of space we cannot discuss all of these, but we will take a closer look at articles, demonstratives, and possessives. Looking at the syntactic distribution of these items, we find that they may occur in the first slot of noun phrases, as evidenced in (30):

(30)

slot 1	**slot 2**	**slot 3**
his	younger	sister
this	good	student
the	best	actor
determiner	**adjective**	**noun**

Uncontroversially, the words in slot 3 form a class (called nouns), and the words in slot 2 form a class (called adjectives). The words in each class share a specific syntactic position and also other properties, as discussed above. Along the same lines we can state that the words in slot 1, i.e. *my, this,* and *the*, form a larger class (with different subclasses, such as definite and indefinite articles, possessives and demonstratives). This larger class is called **determiners**.

Interestingly, demonstratives and possessives may not only occur in slot 1 of an NP, but also as words *replacing* a whole phrase, i.e. as pro-forms acting as the head (and only constituent) of the phrase. This is illustrated in (31):

(31) a. You met [your sister], I met [my sister], she met [her sister], he met [his sister].
You met [yours], I met [mine], she met [hers], he met [his].
b. [These cars] are very expensive, but [those cars] are not.
[These] are very expensive, but [those] are not.

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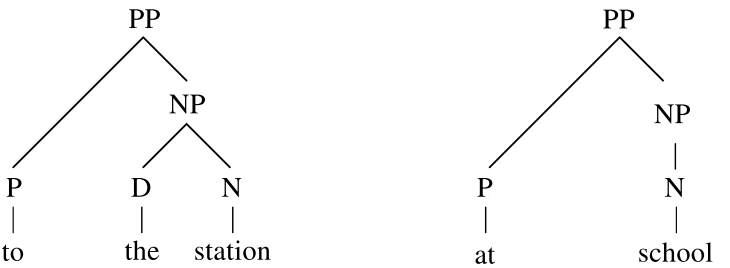
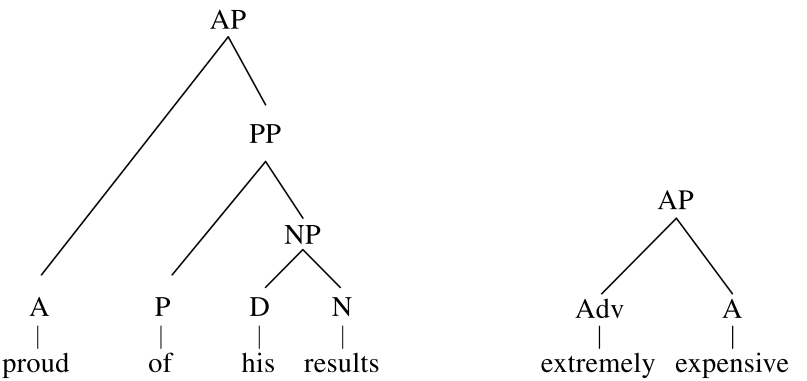
As we can see in (31a), most possessive nominal heads have a form different from their determiner form (e.g. *my/mine, your/yours, her/hers,* also *our/ours, their/theirs*), but not all of them do. The possessive determiner *his* has the same form as the possessive pronoun *his*. And demonstrative determiners always have the same form as demonstrative heads.

We may now return to our tree diagrams from above and label the phrases and constituents accordingly, thereby enriching our tree structure with categorial, i.e. word-class, information. We take the phrases from (25) above and provide each node with a categorial label, depending on the kind of constituent this node represents. We use the following new abbreviations: N = noun, V = verb, A = adjective, D = determiner, P = preposition, Adv = adverb.

(32) a. prepositional phrases



b. adjective phrases



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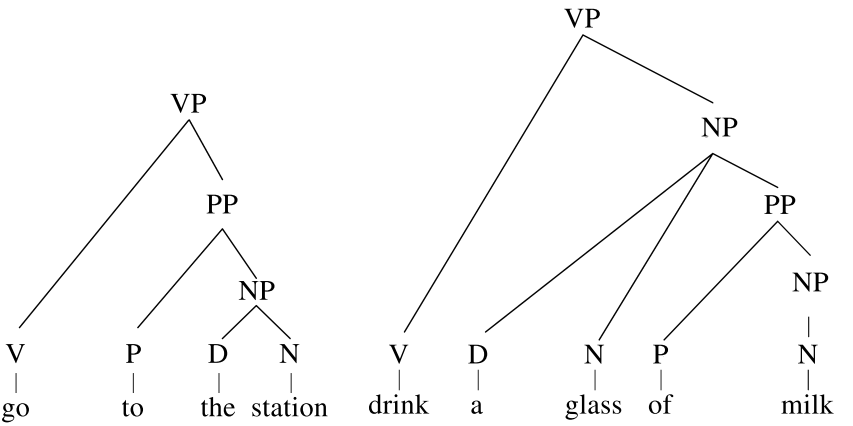
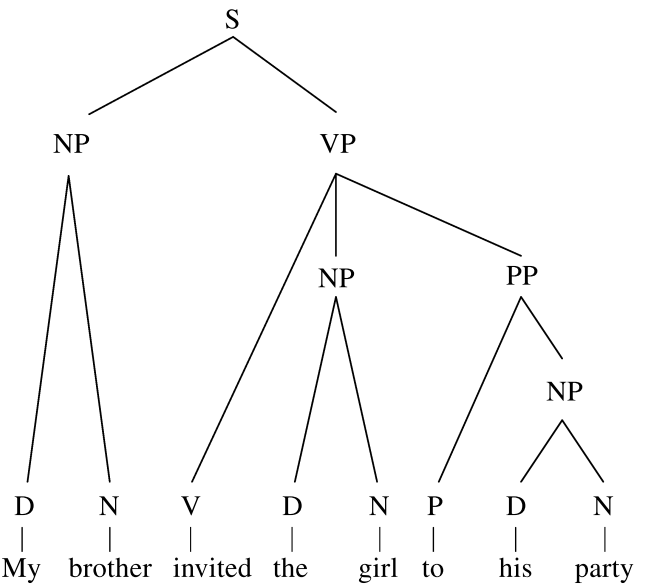
c. verb phrases



We can apply analogous labeling procedures to whole sentences, as illustrated in (33):

(33)



To summarise, we have seen that there is good empirical evidence for the internal structure of sentences. There are a number of different tests that can be employed to test hypotheses about constituency and the word-class membership of a given word. These tests can lead us to a detailed and well-motivated description of the internal structure of sentences and their constituents. Word-

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class membership was shown to be important for the construction of phrases, because phrase structure provides distinct slots which can only be occupied by certain types of constituents. These considerations have led syntacticians to develop whole grammars on the basis of rules that build syntactic structures. These so-called phrase structure grammars use so-called **phrase structure rules** to generate sentences. In (34) this is demonstrated with some rules that can be stated on the basis of our sentences and phrases from above. Note that some constituents appear in parentheses because they are not obligatory in the given phrase:

(34) S → NP VP
NP → (D) (AP) N (PP)
PP → P NP
VP → V (NP) (PP)
AP → (Adv) A

The above rules can be read as 'a sentence consists of an NP and a VP, an NP consists of a determiner, an adjective phrase, a noun and a prepositional phrase, a prepositional phrase consists of a preposition and a noun phrase', and so on. And if we then have a list of words marked as nouns, adjectives, determiners, etc., we can use the phrase structure rules to generate grammatical English sentences. Needless to say, from our little phrase structure grammar to a full and adequate description of English syntax it is still quite a long way to go, but it should have become clear on which methodological principles such a grammar could be built.

Apart from these formal aspects of sentence structure we may of course also look at the functions sentential constituents may fulfill. This will be the topic of the next section.

4.3. The functional level: subjects, objects, adverbials, predicates

Grammarians have traditionally distinguished some basic functions that sentential constituents can fulfill, namely subject, predicate, object and adverbial. From your grammar lessons in school you may still be familiar with definitions of these notions. For example, subjects are usually said to represent the entity which the sentence is about, or to represent the 'doer of the action', while objects represent the entities that are affected by the action denoted by the verb. Adverbials are constituents that are said to give the circumstances of the event denoted by the rest of the sentence (such as time, place, manner, rea-

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son, etc.). In sentence (33), for example, we would say that [*My brother*] is the subject of the verb *invited*, [*the girl*] is the object of the verb *invited*, and [*to his party*] is an adverbial. The term **predicate** is used in a number of different ways in traditional grammar, school grammar books, and formal linguistics. For example, in ancient grammar 'predicate' refers to everything in a sentence apart from the subject. In this frame of thought, a predicate is that part of a sentence that says something about the subject. In contrast, some school grammars use 'predicate' to refer to auxiliary and main verbs in a sentence, while others use the term 'predicator' for the main verb and the term 'predicate' in the ancient sense. To avoid terminological confusion, we will not use the terms 'predicate' or 'predicator', and simply employ the term 'verb'. Having clarified the potential terminological problems surrounding the notion of predicate we will now focus our discussion on the nature of the other sentence functions (subject, object and adverbial), because these are often felt to be much more problematic.

Although intuitively appealing, the definitions of these notions need to be refined in order to be really useful in the analysis of sentences. Let us begin with the notion of subject. One construction that is a challenge for the abovementioned definition of subject is the passive. In sentences in the passive voice the subject is not the 'doer' of the action, but refers to an entity that is affected by an action. Consider the passive sentences in (35), in which the subject is given in bold:

(35) a. [**The house**] was bought by someone from Boston.
b. [**The textbook**] was read by generations of students.
c. [**The graduate students**] were trained in computational linguistics.

Why do we consider the NPs in bold in (35) subjects in spite of their not referring to the 'doers of the action'? One reason is their structural behaviour. Subjects trigger so-called **subject-verb agreement**, a syntactic process which requires subject and verb to share the same person and number features. If the subject is, for example, third person singular, the verb has to be marked as third person singular, too. This is the case in (35a) and (35b). Or, if we have a third person plural subject, the verb must agree with it in its features, i.e. must occur in its third person plural form, as in (35c).

Another structural criterion for subjecthood is the sentential position. Apart from some special types of sentences, the position of the subject in English is rather fixed. Subjects occur immediately before the verb phrase, with only certain adverbials being allowed to intervene. This is different from many other languages, where also other kinds of sentence functions are permitted in preverbal position. These facts are illustrated with data from Eng-

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lish in (36) and data from German in (37), with English glosses given below each German word:

(36) a. [**She**]$_{\text{subject}}$ [loves being outdoors]$_{\text{VP}}$.
b. [**We**]$_{\text{subject}}$ [often] [go skiing in the nearby mountains]$_{\text{VP}}$.
c. [**They**]$_{\text{subject}}$ [never] [came home so late]$_{\text{VP}}$.
d. *[So late]$_{\text{adverbial}}$ came [**they**]$_{\text{subject}}$ never home.
e. *[This man]$_{\text{object}}$ know [**I**]$_{\text{subject}}$ not.

(37) a. [Draußen zu sein]$_{\text{object}}$ liebt [**sie**]$_{\text{subject}}$ über alles.
outdoors to be loves she above all
b. [Den Mann]$_{\text{object}}$ kenne [**ich**]$_{\text{subject}}$ nicht.
that man know I not
c. [Oft]$_{\text{adverbial}}$ gehen [**wir**]$_{\text{subject}}$ Skifahren in den nahen Bergen.
often go we skiing in the nearby mountains
d. [So spät]$_{\text{adverbial}}$ kamen [**sie**]$_{\text{subject}}$ nie nach Hause.
so late came they never home

The data in (36) show that in canonical English sentences the pre-VP position is reserved for subjects and that subjects are normally not allowed to appear in a different position, for example post-verbally, as in (36d) and (36e). In German, however, the first position of the sentence can be occupied also by other kinds of functions (i.e. objects and adverbials), as in (37a-d), and subjects can occur also in other positions, e.g. after the inflected verb.

Another interesting fact about subjects is that in English, subjects are obligatory. This is not true for all languages, as the following sentences from German illustrate:

(38) a. Hier darf getanzt werden.
here is-allowed dance-passive-infinitive
b. You may dance here./Dancing is allowed here./*Here may danced be.

(39) a. Mir ist kalt.
1sg-dative be-3sg cold
b. I am cold./I feel cold./*Me is cold.

In (38a) there is no constituent in sight that would resemble a subject, and in (39a) the NP corresponding to the subject in English is in the dative case. In German the dative is, however, not the case for subjects. Furthermore, the verb in (39a) is third person singular, and thus does not show agreement with the NP denoting the experiencer of the cold (which is first person singular). Hence, no matter how hard we try, there is no subject in (39a). As illustrated in (38b) and (39b), English cannot do without a subject in such sentences.

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The final criterion for subjecthood I want to discuss is a morphological one. In English there is a case distinction between subject and object. This means that depending on the function of a phrase in a sentence, this phrase will exhibit a certain form. Such forms that mark the grammatical function of noun phrases in a sentence or phrase are called **case** forms. The morphological distinction between subject case and object case in English is only visible with pronouns, as in (40), while full NPs always appear in the same form, as in (41):

(40) $[\text{He}]_{\text{subject}}$ took $[\text{her}]_{\text{object}}$ to a concert.
$[\text{She}]_{\text{subject}}$ took $[\text{him}]_{\text{object}}$ to a concert.

(41) $[\text{My brother}]_{\text{subject}}$ took $[\text{my girl-friend}]_{\text{object}}$ to a concert.
$[\text{My girl-friend}]_{\text{subject}}$ took $[\text{my brother}]_{\text{object}}$ to a concert.

(42) below gives the two sets of pronouns. As it becomes clear from this table, not all pronouns exhibit the said case distinction: the pronouns in bold do so, while the second person pronouns and the third person singular neuter pronoun are invariable:

(42)

subject case	**object case**	**person**	**number**	**gender**
I	me	1	singular	–
you	you	2	singular	–
he	him	3	singular	masculine
she	her	3	singular	feminine
it	it	3	singular	neuter
we	us	1	plural	–
you	you	2	plural	–
they	them	3	plural	–

In order to test now whether in a given sentence an NP is a subject, we can replace this NP by a personal pronoun and check its case form. If it is a pronoun in subject case (i.e. a subject pronoun), the noun phrase in question has the function of a subject. (43) illustrates this for the sentences in (35c) and (33), respectively:

(43) a. [**They**]/*[Them] were trained in computational linguistics. (Cf. (35c))
b. [**He**]/*[Him] invited [**her**]/*[she] to his party. (Cf. (33))

The alleged subjects are well-behaved, they can only be replaced by the subject pronouns *they* and *he*, respectively, while the alleged object [*my sister*]

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must be pronominalised with an object pronoun, i.e. *her*. In sum, we arrived at four clear criteria for subjecthood: subject-verb agreement, position, obligatoriness and case marking.

Having clarified the notion of subject, we may now turn to the notion of object, for which similar criteria hold as for subjects. Thus, objects receive object case, as evidenced by pronominalisation facts just discussed. Objects do not show agreement with the verb, but instead are strongly restricted in their distribution. They must occur immediately after their verb, with other constituents not being allowed to intervene:

(44) a. My brother often [invited]$_V$ [**her**]$_{object}$ to his parties.
a'. *My brother [invited]$_V$ often [**her**]$_{object}$ to his parties.
b. My professor [wrote]$_V$ [**two textbooks**] last year.
b'. *My professor [wrote]$_V$ last year [**two textbooks**].

In addition, objects are obligatory constituents, as can be easily seen if we erase the objects from the sentences in (44), as shown in (45). This leads to sentences of questionable acceptance. Note that I have erased also [*to his parties*] in (44a), although the status of this constituent as an object may be debatable. We will return to this issue below.

(45) a. ?My brother often invited.
b. ?My professor wrote last year.

This means that there is a strong tendency for objects to be obligatorily present. Verbs that need an object are called **transitive verbs**, verbs that cannot take an object (e.g. *sleep, laugh*) are called **intransitive verbs**. However, there are sometimes sentences, in which even transitive verbs can do without an overtly expressed object. Consider (46):

(46) a. John no longer eats regularly. He has lost a lot of weight.
b. They kissed and departed.
c. A: Did you receive the letter from your professor?
B: Yes, he already wrote last year.

The objects of the verbs *eat* and *kiss*, respectively, are not surfacing in (46a) and (46b), although eating necessarily involves something to be eaten, and kissing involves someone or something to be kissed. Similar arguments hold for (46c). In such cases, we could say that the objects are only understood, or 'covert'. In general, it is not exactly clear under which circumstances which transitive verb can have a covert object. It should be obvious, however, that such cases are not the rule, but rather the exception, and that the admissibility

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of covert objects may have a lot to do with the specific discourse context in which such constructions occur.

Another criterion of objecthood is the behaviour of objects under passivisation. Sentences in the active voice can be passivised by making the object of the active sentence the subject of the passive sentence. This is illustrated in (47):

(47) a. She wrote [the novel]$_{object}$ at the end of the 19th century.
[The novel]$_{subject}$ was written at the end of the 19th century.
b. I prepared [breakfast]$_{object}$ for the whole family.
[Breakfast]$_{subject}$ was prepared for the whole family.
c. Next year the government will introduce [new tax laws]$_{object}$.
Next year [new tax laws]$_{subject}$ will be introduced.

In (47) the verbs *write, prepare*, and *introduce* have one object each, but there are also verbs that can take two objects, like *give*, or *show*. Such verbs are called **ditransitive**. In semantic terms, the two objects of ditransitive verbs play different roles in the event denoted by the verb. One of the objects denotes an entity that undergoes the action or process denoted by the verb. This object is commonly referred to as the **direct object**. The other object denotes the goal, the recipient or the benificiary of the event denoted by the verb, and is known as the **indirect object**. Let's see how these objects behave under passivisation (we use subscript 'IO' to indicate indirect objects and 'DO' to indicate direct objects):

(48) a. Jill gave [him]$_{IO}$ [the book]$_{DO}$ yesterday.
[He]$_{subject}$ was given the book yesterday.
[The book]$_{subject}$ was given to him yesterday.
b. The director showed [me]$_{IO}$ [the new paintings]$_{DO}$ yesterday.
[I] was shown the new paintings yesterday.
[The new paintings] were shown to me yesterday.

(48a) and (48b) illustrate that both objects can be passivised, respectively, which means that we are indeed dealing with two objects. To summarise, we have found four criteria for objecthood: pronoun case morphology, sentential position, obligatoriness and passivisation.

As we will shortly see, the problem of obligatoriness raises another issue, namely that of the distinction between objects and adverbials. This brings us finally to the sentence function **adverbial** (or **adjunct**). Traditionally, adverbials are defined as constituents that provide information about the circumstances of the action denoted by the verb and its subject and object(s). Such circumstantial information may, for example, concern time, location, manner,

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cause or purpose. This is illustrated in (49), in which I have bracketed the constituents that convey temporal and locative information. Accordingly, they are classified as adverbials:

(49) a. We [often]$_{\text{adverbial}}$ go skiing [in the nearby mountains]$_{\text{adverbial}}$.
b. They [never]$_{\text{adverbial}}$ came home [so late]$_{\text{adverbial}}$.
c. My professor wrote two textbooks [last year]$_{\text{adverbial}}$.

Crucially, such circumstantial information is not obligatory and can be omitted without causing ungrammaticality:

(50) a. We ___ go skiing ___.
b. They ___ came home ___.
c. My professor wrote two textbooks ___.

Thus, apart from the type of information adverbials convey, non-obligatoriness is another defining property of this sentence function. Applying this criterion to the data is, however, often less than straightforward. Consider again sentence (44a), repeated here for convenience:

(51) My brother often [invited]$_{\text{V}}$ [**her**]$_{\text{object}}$ [**to his parties**]$_{\text{?object/adverbial}}$.

While it is clear that [*her*] must be an object, the status of [*to his parties*] is not so clear. Does it give the 'circumstances'? What exactly differentiates 'circumstances' from something that objects express, i.e. the affected participant in an event? Is a party to which one is invited a 'circumstance' or a 'participant' in an inviting event? Without a very good definition of 'circumstance' these questions are hard to answer. If we try out the obligatoriness criterion, it seems that the ungrammatical sentence (45a), in which both constituents were missing, only becomes significantly better if we add [*her*], but not if we add only [*to his parties*]:

(52) a. * My brother often [invited]$_{\text{V}}$.
b. ✓My brother often [invited]$_{\text{V}}$ [**her**].
c. ? My brother often [invited]$_{\text{V}}$ [**to his parties**].

This speaks against assigning object status to [*to his parties*], but confirms object status for [*her*]. Let us test this further with passivisation:

(53) a. She was often invited (by my brother) to his parties.
b. *(To) his parties were often invited to (by my brother) (her).

The passivisation test also shows that [*to his parties*] or [*his parties*] does not act like an object should, since it cannot become the subject of a corresponding passive sentence, no matter how we twist and turn the sentence. Conse-

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quently, we are now in the position to say that [*to his parties*] behaves structurally like an adverbial, although it remains unclear in how far the criterion of 'circumstantial information' is really met.

To complicate matters further, there is often terminological confusion arising from the two terms 'adverbial' and 'adverb'. What is the difference between the two? In terms of their status as constituents the answer is clear: 'adverb' is the name of a word-class, while 'adverbial' is the name of a sentence function. The confusion arises, however, chiefly because the sentential function of 'adverbial' is often realised by an adverb, as illustrated in (49a) and (49b). In these two sentences, temporal circumstantial information is given by constituents that consist of only one word, namely an adverb (*often*, *never*), but this is not necessarily the case in other sentences. In fact, adverbials may not even contain a single adverb, but might formally be realised by PPs, as in (49a) ([*in the nearby mountains*]), or by NPs, as in (49c) ([*last year*]). These discrepancies bring us, finally, to the problem of the mapping of form and function, which we will discuss in the next section.

4.4. The mapping of form and function

We have already seen that the sentential function of adverbial can be fulfilled by different kinds of forms. This is schematically represented in (54):

(54)

function	**form**	**example**
adverbial	NP	[*last year*]
	PP	[*in the nearby mountains*]
	AdvP	[*so late*]

We could add to the set of forms that can function as adverbials still other types of constituents, such as VPs and sentences, as shown in (55):

(55) a. Susan went to university [hoping for a successful career]$_{VP}$.
b. Susan went to university [because she had hoped to make a successful career]$_{S}$.

Both adverbials in (55) give the reason why Susan went to university, and thus give circumstantial information in the above sense. Both constituents can be omitted from their respective sentences and thus meet all criteria for adverbials.

Turning to subjects and objects, the situation is very similar. Although there is a strong statistical tendency that subjects and objects are expressed by NPs, it is not hard to find other kinds of subjects and objects:

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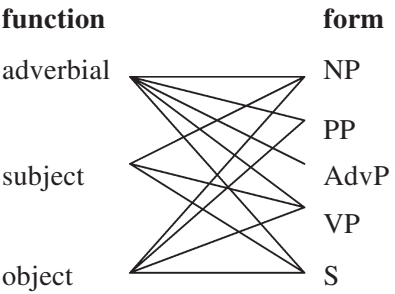
(56) a. [That you are lying]$_S$ is obvious.
[That he is in love with his secretary]$_S$ will not improve his record.
b. I know [that you are lying]$_S$.
She said [Bob will buy a new car]$_S$.
c. [Hoping for a career at university]$_{VP}$ was futile.
He hated [going to his linguistics classes]$_{VP}$.
d. She gave the book [to the librarian]$_{PP}$.
They dedicated their book [to their parents]$_{PP}$.

As indicated by the subcripts, the bracketed constituents in (56a) and (56b) are sentences, and these sentences function as either subject (56a), or object (56b). In (56c) we find VPs in subject and object function, respectively, and (56d) shows PPs as objects. On the basis of our above data, we can enrich the mapping table from above as follows:

(57)



(57) does not give all possible mappings of form and function that can be found in English sentences, but it suffices to show the crucial point: there is a complex mapping of form and function, to the effect that a given form may realise different functions, and a given function may be realised by a variety of forms.

4.5. Conclusion

In this chapter we have seen how one can investigate the structure of sentences. Syntactic constituency can be tested in different ways by observing the systematic structural and morphological behaviour of word strings. Using the systematic evidence obtained by pronominalisation, coordination, gapping, movement, passivisation, omission, or morphological operations, we can establish grammatical categories such as word-classes and phrases, which can then be used to account for the patterning of words in English sentences. Furthermore we have discussed in some detail the sentence functions

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subject, object, and adverbial and their mapping onto the formal categories established earlier in the chapter. It became clear that there are a number of criteria that can be used to distinguish these functions and describe their behaviour. Finally, we saw that each sentential function can be realised by a number of different formal categories and that a given formal category may perform different functions in a sentence.

Further reading

There is an abundance of introductions to syntax. A very nice one is Aarts (2008), which lays special emphasis on syntactic argumentation. A detailed discussion and justification of constituency can be found in Radford (1988). A theoretically oriented introduction is Radford (2004). Students of English should also make themselves familiar with the big reference grammars, such as Quirk et al. (1985) and Huddleston and Pullum (2002). Condensed (and better affordable) versions of these 1000-plus page grammars are also available: Greenbaum and Quirk (1990), and Huddleston and Pullum (2005). Another good grammar textbook, which is especially well suited for non-native speakers of English, is Downing and Locke (2006).

Exercises

Basic level

Exercise 4.1.: Constituency

Draw tree diagrams for the following sentences and provide tests for each of the constituents you postulate.

(58) a. The students must draw diagrams on the blackboard.
b. Her obsession with tree diagrams was extremely disturbing.
c. Flying planes can be dangerous.

Exercise 4.2.: Word-class

Some dictionaries give ‘adverb’ as the part-of-speech of the word *yesterday.* Check this categorisation with the help of the following data. What would you say is the part-of-speech of *yesterday*, given its behaviour in these sentences? Why do you think that some dictionaries classify it as an adverb?

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(59) a. I met her yesterday and the day before.
b. There is nothing so boring as yesterday's paper.
c. Have you seen John's paper?
d. The day before yesterday was Monday.
e. I met Jill before John.

Exercise 4.3.: Object

In section 4.4. it is claimed that the bracketed constituents in (56d) above are objects. Apply the tests for objects and show that these constituents are indeed objects.

Exercise 4.4.: Mapping form and function

Determine the functions of the bracketed constituents in (60) and draw a schema similar to that in (57) that shows the mapping of form and function.

(60) [Yesterday] [Helen] worked [at the restaurant] [because she needs the money].

Advanced level

Exercise 4.5.: Constituency

Draw a tree diagram for the following sentence and provide tests for each of the constituents you postulate.

(61) We expected the teacher to give us good grades.

Exercise 4.6.: Constituency

Why is (62) ungrammatical? Go back to the coordination tests for constituency and apply the rationale behind these tests to sentence (62).

(62) *Could you turn off the fire and on the light?

Exercise 4.7.: Constituency

Give the internal structure of the NP [the chancellor of Germany]. There are the following three logical possibilities:

(63) a. NP → D N PP
b. NP → D [N PP]
c. NP → [D N] PP

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Which of the three structures can account best for the language facts? Consider the following data and use them to give evidence for your analysis.

(64) a. The present [chancellor of Germany] is much more popular than the last *one*.
b. *The [chancellor] of Germany cheated the *one* of Austria.
c. She was the first [chancellor of Germany] and [chair of her party].
d. She was elected [chancellor of Germany].
e. A: What's her new job?
B: [Chancellor of Germany]! I'm not kidding.

Devise similar arguments for the internal structure of the NPs [a student of linguistics] and [a student from Manchester].

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