8
Syntax
Putting words together
Kersti Börjars

8.1 Introduction
Syntax is the subdiscipline of linguistics that analyses structure; how words and phrases are put together. In this chapter, we will look at categories – the smallest building blocks of syntax – how these are combined to form constituents, and at some of the functions that these constituents can have. To start with, I will use examples from English only, but in §8.5 I will show that there is a fair amount of structural variation between languages. In §8.6, I will consider the representation of structure and in §8.7, I will examine the role that structure plays in theoretical approaches to language.

8.2 Categories
The smallest unit of analysis in syntax is the word. In written language, it is relatively easy to establish where a word begins and ends. For instance, there is general agreement that this sentence consists of thirteen words. However, even for English there are some difficult issues; if I had used there’s instead of there is in the third sentence of this paragraph, would there only have been twelve words? For a language that does not have a written form, it is generally even more difficult to establish what the smallest unit of the syntactic analysis should be. However, this is an issue that is dealt with within morphology (Chapter 7), and in this chapter I will assume that you know what a word is.

Words can be divided into classes or syntactic categories on the basis of their behaviour. It is not uncommon to start defining these categories in terms of meaning: nouns are words that refer to a ‘person, place or thing’ and verbs refer to ‘actions’. There are approaches to syntax in which semantic criteria play an important role (for instance the Cognitive Grammar of Langacker 1990), but generally, categories are defined on the basis of form instead. Linguists use categories in order to capture groups of words that behave in a similar way as far as the syntax goes, and this does not always depend on meaning. If we take the example in (1), we see that mother, handbag, anger and existence appear to be able to do the same thing as far as the syntax is concerned, but whereas the first two fall under the semantic definition of a noun, anger and existence would not normally be considered a ‘person, place or thing’.
Syntax

(1) His {mother/handbag/anger/existence} has always struck me as interesting.

A similar point can be made for a semantic definition of other categories. For this reason we use formal criteria, this means that the criteria used to define categories are based on the form and the syntactic behaviour of the words.

Four major categories are generally recognised: NOUNS, VERBS, ADJECTIVES and PREPOSITIONS. In English, nouns can combine with the to form a full phrase, many nouns can also take a plural marker, generally –s, and combine with a(n). In other languages the criteria may be different, there may for instance not be a word similar to the or there may be things like case markers that can attach only to nouns. Verbs can take a third person singular –s in English – and can occur in past tense. Adjectives modify nouns and can occur with a comparative form –er (or more) and a superlative form –est (or most). Prepositions are the most difficult to define structurally, largely because they do not take any inflection. They can be recognised structurally because they combine with a noun phrase to form a full phrase (see §8.3 for phrasal categories).

You may wonder what happened to ADVERBS: do they not form a major category? In many descriptions of English it is indeed included as a fifth category. They are the words which modify verbs, adjectives or other adverbs and they frequently end in –ly. An alternative to recognising adverbs as a separate category is to put them together with adjectives and define them as modifying words that surface in their adjective form when they modify nouns and in their adverb form when they modify any other category. This merger of the two categories may be especially tempting when considering American varieties of English such as the title of Jim Leonard Jr’s 1986 play, given in (2).

(2) And they dance real slow in Jackson.

Here slow modifies the verb dance and hence would be an adverb, real modifies slow and would therefore also be an adverb, but still they have the same form they would have if they modified a noun and hence were adjectives: a real fairy or a slow dance. In British English, it would generally have been expressed as really slowly. Tempting though it may be to consider adjectives and adverbs as belonging to the same category, there are also reasons to keep them separate, though this is not the place to go into the details of the arguments (see Payne et al. (2010)).

For almost all the criteria mentioned here, there are exceptions. Not all things that would normally be classified as nouns can take a plural form – they are non-count nouns – and not all adjectives can occur in a comparative or superlative form – they are not gradable. When we come across words that do not have the characteristics we have established for the categories, we can use similarity in distribution to argue for category membership. Take dead for instance; if your life depended on assigning it to a category, you would probably say ‘adjective’. Still, it does not have any of the formal properties: *deader/*deadest, even ?more dead and ?most dead sound distinctly odd. We can create a sentence with a more well-behaved adjective such as happy (happier/happiest) and test whether dead could replace happy in this sentence. If it can, we can take this as evidence that it is an adjective, this is using distributional criteria to establish category membership. Using this approach, we can indeed argue that dead is an adjective: The customer said that it was a happy/dead parrot.

The categories we have looked at so far are often referred to as the lexical categories. These categories have a large membership, and the words that belong to them tend to have
lexical content, they have full semantics. In addition, there are a number of functional categories which are closed in the sense that there is a limited membership and their members serve a grammatical function and have a less full meaning. They tend also not to accept modification. Examples of such categories are determiners such as *the* and *this*, subordinating conjunctions such as *whether* and *because* and coordinating conjunctions such as *and* and *but*. You may object here that prepositions also form a relatively small closed class with little lexical meaning and little opportunity for modification. A particularly striking example is *of*, which alternates with the grammatical marker *’s* in pairs such as the *oldest man’s car* and *the car of the oldest man*. Though prepositions are generally considered a lexical category, they share some characteristics with functional categories and in some descriptions are classed as such. As you will see in the next section, the term lexical category is also used in another sense, but it is generally clear which meaning is intended.

For the lexical categories, I will use the labels N(oun), V(erb), A(djective), Adv(erb) and P(reposition). I will return to the functional categories in §8.7. Now we have sorted out the basic building blocks of syntax, we can move on and start building phrases.

### 8.3 Constituents

A sentence is not just a string of words, but words combine together to form bigger units, called *constituents*. These constituents in turn combine to form bigger constituents, to give a hierarchical structure. In order to establish the constituent structure of a language, tests can be applied that aim at exploring the extent to which a string of words behaves like a unit. Since we are aiming to explore the formal structure, rather than the semantics, these tests should ideally not make reference to meaning, but on the assumption that there is frequently a close correlation between form and meaning, sometimes semantics slips into our constituency tests. However, given that native speakers have intuitions about structure also in nonsensical sentences, it is best to focus on tests that do not refer to meaning. For instance a sentence like *An outrageous beach admired the screaming abstraction* does not make sense, but native speakers would probably agree that *outrageous beach* forms a unit, but *beach admired* does not.

I will exemplify with four tests here that all aim to assess the extent to which a string of words behaves as an independent unit within a particular sentence. It is important that we test constituents within their contexts since a particular string may form a constituent in one sentence but not in another. For instance, a native speaker of English who heard the two sentences *Mitch was drinking the milk* and *While Mitch was drinking the milk fell off the table* would probably have an intuition that *drinking the milk* is a constituent of the first but not of the second. Indeed, many writers would add a comma between *drinking* and *milk* in the second sentence.

Four commonly assumed constituency tests are:

- **substitution**: if a string of words can be replaced by one word, this can generally be taken as evidence that it forms a constituent
- **coordination**: if a string can be coordinated with another string, it is likely to form a constituent
- **sentence fragment**: if a string can stand on its own it is likely to be a constituent
- **movement**: if a string can be moved as a whole to a different position within the sentence then it is usually a constituent.
These tests are phrased with caution, words such as *generally*, *likely* and *usually* are used. This is because none of the tests is absolutely sound. The tests also do not state what happens if they do not go through, for instance, if you cannot move a string of words within a sentence, this may be because the strict word order of English does not allow it, particular if a string is deeply embedded within the structure.

Let’s apply the four tests to the two example sentences about *Mitch* to test whether *drinking the milk* is a constituent. The asterisk indicates that the example is ungrammatical and the hash symbol that the example is odd or does not have the required meaning.

(3) Mitch was drinking the milk.

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Substitution</strong></td>
<td>Mitch was yawning.</td>
</tr>
<tr>
<td><strong>Coordination</strong></td>
<td>Mitch was [drinking the milk] and [eating the food].</td>
</tr>
<tr>
<td><strong>Sentence fragment</strong></td>
<td>– What was Mitch doing?</td>
</tr>
<tr>
<td></td>
<td>– Drinking the milk.</td>
</tr>
<tr>
<td><strong>Movement</strong></td>
<td>Drinking the milk is what Mitch was doing.</td>
</tr>
</tbody>
</table>

(4) While Mitch was drinking the milk fell off the table.

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Substitution</strong></td>
<td>*Mitch was yawning fell off the table.</td>
</tr>
<tr>
<td><strong>Coordination</strong></td>
<td>*While Mitch was [drinking the milk] and [eating the food] fell off the table.</td>
</tr>
<tr>
<td><strong>Sentence fragment</strong></td>
<td>– #What was Mitch doing when fell off the table? / #What fell off the table when Mitch was?</td>
</tr>
<tr>
<td></td>
<td>– #Drinking the milk.</td>
</tr>
<tr>
<td><strong>Movement</strong></td>
<td>*Drinking the milk is what Mitch was doing fell off the table.</td>
</tr>
</tbody>
</table>

For the sentence fragment test, I have added a question. What we are exploring here is whether the string *drinking the milk* is a constituent of this sentence, and in order to make sure that we test the constituent in the right environment, I have made it the answer to a question based on the original sentence.

When you test a string of words that is not a constituent, these tests will generally yield an ungrammatical sentence. Since we are all trying to use only grammatical sentences when we write or speak, it can be difficult to make the ungrammatical sentences. Take the coordination test in (4), we are testing *drinking the milk* and all we do is to try to coordinate that with a string of words that looks similar, *eating the food*. The movement test is more difficult to apply, because there are many different ways of trying to move a constituent. In both (3) and (4), I have used the ‘SOMETHING is what SOMEONE was doing’ test, where the initial ‘something’ is the string moved out of the sentence, which is replaced within the sentence by *was doing*, but everything else in the original sentence stays the same. Even though some of the examples are complicated, the application of the tests in (3) and (4) should convince you that *drinking the milk* is a constituent in (3) but not in (4).

Let’s now try a string that is more deeply embedded.

(5) Mitch ate the really big sandwich.

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Substitution</strong></td>
<td>Mitch ate the tasty sandwich.</td>
</tr>
<tr>
<td><strong>Coordination</strong></td>
<td>Mitch ate the [really big] and [very tasty] sandwich.</td>
</tr>
<tr>
<td><strong>Sentence fragment</strong></td>
<td>– #How / #What was Mitch eating the sandwich?</td>
</tr>
<tr>
<td></td>
<td>– #Really big.</td>
</tr>
<tr>
<td><strong>Movement</strong></td>
<td>*It was really big that Mitch ate the sandwich.</td>
</tr>
</tbody>
</table>
Here the results are clearly a little harder to interpret. Movement and sentence fragment do not work as well as they did in (3). When this happens, we can adopt an alternative strategy: if big does not form a constituent with really, it would have to form one with sandwich. So we can test that constituent instead and then compare the results with (5).

(6) Mitch ate the really big sandwich.
   
   Substitution: *Mitch ate the really pie. / *Mitch ate the really horrible.
   
   Coordination: ?Mitch ate the really [big sandwich] and [tasty pie].
   
   Sentence fragment: – #What was Mitch eating the really?
   – #Big sandwich.
   
   Movement: *It was big sandwich that Mitch ate the really.

The only test that might possibly be deemed to give an acceptable result here is coordination. However, since we are coordinating only big sandwich and tasty pie, really would modify both constituents, so that it should mean really big sandwich and really tasty pie. It is not clear that this is the case in this example. The results in (6) are clearly worse than those in (5), and we can conclude that really big is a constituent of the sentence, but that big sandwich is not. The reason the tests do not work quite as nicely in (5) as they did in (3) is that really big is deeply embedded within the sentence. When I come to represent structure in a later section, I will be able to make this visually clear.

In §8.2, I showed how individual words can be assigned to categories such as nouns and verbs on the basis of their behaviour. The same categories can be used to describe the constituents formed by words. Generally, when two constituents form a new larger constituent, one of the component constituents is more central than the other. This constituent is called the head, and its category will be used also for the larger constituent (I will return to discuss constituents that do not have a head in §8.7). However, a distinction needs to be made between the categories of words and the categories of larger units. This is where the second use of the term lexical category that I mentioned in §8.2 comes in; a word belongs to a lexical category whereas a larger unit belongs to a phrasal category. In one sense ‘lexical’ contrasts with ‘functional’ and in another with ‘phrasal’.

In order to establish what the phrasal category of a constituent is, we need to know which element is the head. As a first guideline, we can use a ‘kind of’ criterion: in a phrase like tasty pie, pie is the head because a tasty pie is a kind of pie. In a similar spirit, the head can be defined as the element that can represent the whole and that is obligatory, though non-heads can also be obligatory. The head is also where features crucial to the phrase are marked. The phrase the child’s toy duck with orange feet is singular as witness the fact that it combines with is rather than are as the appropriate form of the verb in (7a), whereas the child’s toy ducks with orange feet is plural, as illustrated by (7b). We could change the number of any other noun in the sentence, but it would not make any difference to the verb as illustrated in (7c).

(7) a. The child’s toy duck with orange feet is not in the bathtub.
   b. The child’s toy ducks with orange feet are not in the bathtub.
   c. The children’s toy duck with an orange beak is not in the bathtub.

This is then used to argue that duck is the head of the child’s toy duck with orange feet.

A number of other criteria for head status have been proposed, but many of these rely on theoretical assumptions made about syntax. In fact, even the general criteria I have mentioned
here do not always yield an unambiguous result. In the duck, duck is the head by both the ‘kind of’ criterion and the morphological marking criteria: the duck – the ducks. However, if we take an example like that duck, we get a different outcome. If we make it plural, both elements need to be marked for number: those ducks. There are even phrases in which that/those is the only element that marks number: that sheep/those sheep. Still, we would not want to say that duck is the head of the duck, but that is the head of that duck.

Determining what is the head within a phrase is not an absolutely straightforward matter. As you will see in a later section, this has meant that there is some disagreement in the literature as to what the category of some phrases are. At this point, I will follow tradition and assume that duck is the head of the duck and that duck as indeed it is of the child’s toy duck with orange feet. Since the head is a noun, the phrase is a NOUN PHRASE (NP). In (8)–(11), I provide sentences exemplifying the other major categories, with the phrasal category in bold and the head word underlined.

(8) Verb Phrases (VPs)
    a. Mitch **devoured** the fish.
    b. Mitch **gave** the referee the ball.
    c. Mitch **smiled**.

(9) Adjective Phrases (APs)
    a. The children are **responsible for** the dreadful mess in the fridge.
    b. The children are **terribly curious**.
    c. The children are **tired**.

(10) Adverb Phrases (AdvPs)
    a. The lawyer works **independently of** the commission.
    b. The lawyer works **ridiculously slowly**.
    c. The lawyer works **tirelessly**.

(11) Preposition Phrases (PPs)
    a. The protesters walked **right into** the council meeting.
    b. The protesters appeared **from behind** the wall.
    c. The protesters jumped **down**.

A number of comments are in order here. In (11b), behind the wall is a PP, which means that the PP from behind the wall contains another PP. In fact all phrasal categories can contain elements of the same phrasal category, another example is (10b), where an AdvP ridiculously appears inside an AdvP.

In all the (c) examples above, the phrase consists of just one word. The question then arises why this word is deemed to be of the phrasal category, rather than of the lexical category; why is smiled in (8c) a VP, and not a V? The answer is that it is both a V and a VP. Every word belongs to a lexical category and smiled is a V. However, since smiled has the same distribution as the other VPs in (8), we can assume that it is also a VP. Similar arguments can be made for the other (c) examples. In each category, there are words which do not require any additional elements and therefore can act as a phrasal category on their own.

Devoured in (8a) is different from smiled in that it cannot occur without a phrase like the fish accompanying it. These phrases that are required by an element are referred to as
COMPLEMENTS; the fish is the complement of the head devour. A complement does not have to be obligatory, but it will have a close relationship with the head. Compare the behaviour of eat with that of devour in (8a); though Mitch ate the fish seems identical in structure to (8a), Mitch ate is also a grammatical sentence on its own and hence the fish is not obligatory here. However, because of the similarity in behaviour, the fish is still referred to as the complement of ate.

Verbs and Prepositions generally occur with complements; all examples a, b and c in (8) to (11) include complements. In (9a) and (10a), there is an adjective and an adverb, respectively, taking a complement, but such examples are rarer.

The notion of complement may become a little clearer when we contrast it with another type of element that heads can combine with. Consider the examples in (12).

(12) a. Mitch ate the fish.
   b. Mitch ate yesterday.
   c. Mitch ate the fish yesterday.
   d. ?Mitch ate yesterday the fish.

Even though ate combines with something in both (12a) and (12b), it does so in different ways. Yesterday, which I will refer to as a modifier, does not have the close relationship with the verb in (12b) that the fish does in (12a). For one thing, as (12c) and (12d) show, under normal circumstances, the complement occurs closer to the head than the modifier does. The verb also determines how many complements it can have: smile takes no complement, eat takes one and give takes two, as in (8b). However, all these verbs can occur with any number of modifiers; we can add a string of modifiers like yesterday in the kitchen before he left to any of the verb phrases smile, devour the fish or give the referee the ball. A VP can then consist not just of the verb and its complement as in (8), but can also include modifiers, so that ate the fish yesterday is a VP in (12c). I will return to the internal structure of this phrase in §8.6.

The distinction between complement and modifier can be made with respect to all the categories discussed in this chapter. I will turn now to another structural relation and illustrate it with respect to NPs. In (13), there is a phrase with a noun as a head, it contains a complement of rare birds and a modifier with many great illustrations.

(13) study of rare birds with many great illustrations

It should be clear why study is the head here. There are a number of reasons to consider of rare birds a complement; it is closely connected to study, there can only be one such phrase and it has to occur close to study. The phrase study of rare birds can also be compared with the VP study rare birds, where rare birds is the complement of the verb. With many great illustrations in (13), on the other hand, is not unique — we could add another similar phrase to make study of rare birds with great illustrations on the top shelf. However, the phrase in (13) is not quite complete; it could not be inserted in a sentence as it stands, as the ungrammaticality of (14a) shows. What is required to make it a complete noun phrase is a determiner, as in (14b).

(14) a. *Study of rare birds with many great illustrations is expensive.
   b. A/The/This study of rare birds with many great illustrations is expensive.
These elements that can be said to complete phrases are called SPECIFIERS. Like complements, they are there because the head word requires them, but they are not as closely related to the head as complements.

A phrasal category can then consist of just the head, or it can include a complement (if the head selects for one), a specifier and any number (in principle) of modifiers. However, not all of the phrase types are equally liberal when it comes to complements, modifiers and specifiers. Prepositions usually require a complement, but are quite limited in what modifiers they can occur with. Adjectives tend to occur without either complements or modifiers, and adverbs even more so. It can be argued that adjectives, adverbs and prepositions do not have specifiers. Though the different phrasal categories show some variation, there is a system which incorporates specifiers, modifiers and complements and that assumes the different categories have a parallel structure. This system is called X-bar syntax and I shall return to it in §8.6.

In the discussion of phrasal categories, I have said nothing about sentences. This is because they do not play a central role in the system of lexical and phrasal categories. There is not really any better way of defining 'sentence' than 'that which occurs between two major punctuation marks'. For our purposes it is also not a terribly interesting notion. A clause, on the other hand, is of interest. A clause consists of a verb, everything required by the verb and any modifiers of the verb. In the examples in (8) and (12), I included only the verb, its complements and modifiers in the VP. However, having now introduced specifiers as that which makes a phrase complete, we might want to reconsider this. A verb phrase like devoured the fish or ate the fish yesterday is not really complete until you add Mitch. Mitch devoured the fish and Mitch ate the fish yesterday are both clauses (in (8) and (12) they are also sentences, but that is not so interesting to us here), but we could also refer to them as VPs. As I will show in §8.7, in syntactic theories, there is some variation with respect to the category assigned to clauses.

8.4 Functions

We have established above that the toy duck is a noun phrase (though I did point out that it can also be argued that the determiner has some head-like qualities, a fact that I will return to in §8.7). However, this is not all we need to know about the phrase in order to be able to talk about its role in the syntax of a sentence. Compare the sentences in (15).

(15) a. The toy duck was floating in the bath tub.
    b. The dog chewed the toy duck.
    c. The child fed the toy duck some soap.

In all examples, the toy duck forms a constituent, but it has a different function or grammatical relation in each sentence. In (15a), it is a SUBJECT, recognisable as such in English for instance because it can invert with the following verb to make a question: Was the toy duck floating in the bath tub? Not all verbs allow this, but once you have a verb that can do it, it is the subject it inverts with. In (15b) and (15c), it functions as an OBJECT. A common test for object status is whether the phrase can become the subject of a corresponding passive sentence: The toy duck was chewed by the dog and The toy duck was fed some soap by the child. Though the toy duck passes the test for object status in both (15b) and (15c), the two instances are different. In examples like (15c), there is always a parallel example where the same phrase occurs with to and follows the other phrase: The child fed some soap to the toy.
duck. An object that can occur with to instead is called an INDIRECT OBJECT and the other object is the DIRECT OBJECT. Note that once you have turned the indirect object into a to-phrase, you can make a passive sentence with some soap as the subject: Some soap was fed to the toy duck by the child. Hence some soap is also an object in (15c), since it cannot be replaced by a to-phrase, it is a direct object.

What functions are possible depends on the verb: chew can take only one object, whereas feed may combine with two. In §8.3, I used the term complement for those elements that are selected by the head. The difference between the two terms is that complement is a general term indicating a structural relationship with a head, whereas object describes a function a phrase may have within the clause. An object is then a function that the complement of a verb may have, but there are also a number of other functions that the complements of verbs may have (see for instance Börjars and Burridge 2010: Ch. 4).

The functions we have looked at here are all selected by a verb, and terms such as subject and object tend to be used mainly at this level, though it can also be used with other categories. The centrality of the functions to verbs is indicated by the fact that verbs are subcategorised according to which functions they permit. A verb that takes no object is classed as INTRANSITIVE, one that takes one object is described as MONO-TRANSITIVE and those that take two objects as DI-TRANSITIVE. The functions we have considered here are not the only functions that can be distinguished. For a more complete list, see Börjars and Burridge (2010: Ch. 4).

8.5 Cross-linguistic syntactic variation

Languages vary greatly as to the role that syntax plays in their organisation. There are some languages where syntax can be said to play a smaller role than it does in English, these are called polysynthetic languages, and they rely heavily on morphology (see Chapter 7). These languages may use one word to express that which English expresses through a sentence. Mithun (1999: 38) gives the example kaipiallrulliniuk from Yup’ik, an Eskimo-Aleut language, which can be shown to be one word even though in meaning it equates to the English sentence The two of them were apparently really hungry. At the other extreme are languages that make little or no use of morphology, so that syntax becomes more important. One such language is Vietnamese, where even the plural marker is a separate word, so that the word for ‘I’ is tôi and ‘we’ is chúng tôi. Such languages are referred to as analytic or isolating.

Languages also vary with respect to what categories can be distinguished. It is generally assumed that nouns and verbs can be distinguished in most languages, though not quite all. Samoan and Tagalog are languages for which it has been argued that no meaningful distinction can be made between these two word classes (see for instance Rijkhoff 2003). The word class adjective is more generally assumed not to be universal. When we say that a language lacks a certain word class, we do not mean that it is impossible to talk about the kinds of concepts that these word classes tend to express in English. A language that lacks a distinction between verbs and nouns does have words to refer to both actions and things, it is just that there is no morphosyntactic criterion that can be used to divide them into two categories. If we take the distinction between verbs and adjectives in English, a set of criteria can be established to distinguish the two. The most obvious one is maybe that verbs can be marked for present or past tense, but adjectives cannot. So, if you want to talk about an event of walking having taken place in the past, we add –ed and use walked. If, however, you want to talk about a house that was red in the past, we cannot add –ed to red. Instead we have to
use a verb in the past tense: *was red*. In many languages, the words that express the same things as adjectives in English behave just like intransitive verbs, so that you can add a past tense marker to the word for ‘red’ and get the same meaning as the English *was red*. In the Malayo-Polynesian language Kambera, for instance, the sentences *The mango was ripe* and *The mango fell* would be structurally identically; there would be one word for FALL+PAST and a word with a similar structure RIPE+PAST (Klamer 1998: 115–18).

I used constituency tests in §8.3 to establish that English sentences have internal structure. In (3) above, I showed that *drinking the milk* is a constituent of *Mitch was drinking the milk*. The verb and its object form a structural unit in English, and since the verb is the head of this unit, *drinking the milk* is a VP in this sentence. Languages that have structure in this way are described as configurational. There are languages, where it can be argued that the object does not form a closer unit with the verb than the subject does. One such language is Irish, where the standard word order is verb-subject-object, so that the object is not adjacent to the verb, and there is also further evidence that the verb and the object do not form a constituent (see Carnie 2005). It is common to refer to languages with no evidence of a VP as non-configurational. Whereas it can be argued that there is no evidence of a VP in Irish, the component parts of noun phrases do stick together and occur in a specific order, hence the language is assumed to have NPs. There are, however, languages which are more thoroughly non-configurational than this, for instance in that noun phrases can be discontinuous. In (16), there is an example from Wambaya where the determiner and the noun of the subject noun phrase (in bold) are separated (Nordlinger 1998: 31).2

(16) _Nganki_ ngiy-a lurrgbanyi **wardangarringa-ni**
    this.SG.II.ERG 3SG.F.A.PST grab moon.II-ERG
    _alaji_ gulug-barda
    child.II(ACC) sleep-INF

‘The moon grabbed her sleeping child.’

One characteristic feature of Wambaya is that there is an element representing features such as past tense and subject agreement features (see Chapter 7) that has to occur in second position, here this is _ngiya_. This element can be compared with _does_ in _He does eat_ in the sense that it has little meaning beyond the features. Apart from this second-position element, the word order is very free. In (16) the first element is a determiner, equivalent to something like _the_ or _this_ in English. It is marked as singular and the II indicates feminine gender and ERG is a case marker showing that it will be part of the subject of the clause. You can see that the word for moon has the same marking and this is how the hearer knows that the determiner forms a unit with the word for moon and not with the word for child. The equivalent of _the moon_ forms a semantic unit, even though the two words are not adjacent and hence do not form a constituent in the usual sense (though I will return to different theoretical approaches to constituency in §8.7).

From a typological perspective, English is a language with quite rigid structure. If you were to study syntax using only English data, you would get a simpler picture than if you include a broad range of typological data. In this section, I have provided examples of how both categories and constituency can play quite a different role in languages. It will not surprise you that there is also some variation with respect to functions. In §8.7 we will return to the issue of how to capture this variation.
8.6 Representing syntactic structure

In §8.3 I introduced X-bar syntax and the notions of head, complement, modifier and specifier. A head may combine with a complement; whether it does or not is determined by the head. This unit may then combine with any number of modifiers: this is not determined by the head, but is a matter of speaker choice. Finally, the phrase may contain a specifier, which is unique and which is again determined by the head. I introduced the notion of a lexical versus a phrasal category; nouns can combine with complements, modifiers and specifiers to form noun phrases; we get NPs headed by Ns. In (14), I gave an example of a phrase built around an N which was not a full NP, so that a category between N and NP is required. This category is referred to as N’, pronounced N-bar. Within this notation, NP is also sometimes referred to as N” or N-double-bar, but that is getting less common.

In §8.3 I pointed out that the categories I identified there – N, V, A, Adv and P – all behave a little differently with respect to complements, modifiers and specifiers. Within X-bar syntax they are, however, assumed to have the same basic structure so that if we use X as a variable over any category, we have the categories X, X’ and XP (or X’’), hence the name X-bar syntax.

Having identified names for the different types of constituent, I turn now to different ways of representing the constituent structure. It used to be common to mark constituency boundaries with square brackets and to label the brackets with the category of that constituent. If we take the noun phrase a teacher of early music with false teeth, where of early music is a complement, with false teeth is a modifier, and a is the specifier, we would get the representation in (17).

\[(a)\ [ [ \text{teacher} ]_{N} [ \text{of early music} ]_{NP} [ \text{with false teeth} ]_{NP} ]_{NP}\]

This does not provide a good visual representation of the structure and now that word-processing systems allow us to use graphics more easily, constituent structure is almost exclusively represented by trees. This gives the tree in (18) instead of (17).

\begin{itemize}
\item \text{NP} \rightarrow \text{D} \rightarrow \text{N'} \rightarrow \text{PP} \rightarrow \text{a} \rightarrow \text{N'} \rightarrow \text{PP} \rightarrow \text{with false teeth} \rightarrow \text{teacher} \rightarrow \text{of early music} \end{itemize}

In a phrase structure tree such as (18), each node represents a constituent. The category of the constituent is indicated by the label on the node. A string of words is a constituent if there is a node that dominates that string and nothing else, where a node dominates another node if it is above it in the tree and there is a direct line of branches between them. Hence \textit{with false teeth} is a constituent because there is a node which dominates just that string and it is of category PP as indicated by the label on the node. The triangle notation below both
PPs indicates that we are not interested in the internal structure of these phrases here. The string *a teacher*, on the other hand, is not a constituent here because the only node that dominates both *a* and *teacher* dominates other words too, in fact it is the node which dominates the whole of the noun phrase.

Phrase structure trees can be said to be generated, or licensed, by phrase structure rules. The rules required to generate the tree in (18) are provided in (19).

(19) a. NP → Det N’ introduces a specifier
    b. N’ → N’ PP introduces a modifier
    c. N’ → N PP introduces a complement

This does not represent the full range of noun-phrase structure of course, but these rules will serve to illustrate a couple of issues in relation to X-bar syntax. The relationships between nodes tend to be described using female family terminology: the NP node in (18) is the mother of D and the highest N’, the N and the lowest PP are sisters. The rule in (19a) states that a tree may contain a subtree which has an NP as its mother and has two daughters: a D and an N’. The bottom part of the tree in (18) is licensed by the rule in (19c), which allows a tree which has an N’ mother and two daughters: N and PP. The rule in (19b) is particularly interesting since it has an N’ on both the left and the right of the arrow. This means that the rule can apply to its own output. If we apply (19b) once we get the tree in (20a). Since this has an N’ daughter, we can apply the rule again and get (20b) and in principle we could repeat this an infinite number of times. This is called recursion and is appropriate for a rule introducing modifiers since these can be repeated: *a teacher of early music with false teeth*, *a teacher of early music from Birmingham with false teeth* until it becomes too difficult to process for the hearer.

(20) a. 
    b.

We can then draw a schematic general tree to capture the principles of X-bar for headed phrases. X, Y, Z and Q are variables here and can stand for any category.

(21) 

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Now consider a sentence such as (22).

(22) Oscar tickled the boy with the feather.

This sentence is ambiguous; it can either mean that Oscar used a feather to tickle the boy or that the boy Oscar tickled had a feather. In one case with a feather modifies tickled the boy and in the other the boy. Since it is a structural ambiguity, we should be able to disambiguate it in our tree representation, and indeed we can. The trees in (23) provide the structure for the two meanings. It should now be obvious which one is which. Note that in (23b), the sister of the PP must be of the category N', not N, since the PP is a modifier, not a complement. Since there is no complement of N in this noun phrase, the lower N' only has one daughter, N.

(23) a. 

```
V'  
   /   
V'   PP  
   /     
V  NP  
   /     
tickled the boy with a feather
```

b. 

```
V'  
   /   
V  NP  
   /     
tickled the N'  
   /     PP  
   /         with a feather
   /         N
   /         boy
```

When considering the difficulty in applying the constituency tests to really big in Mitch ate the really big sandwich, I said that it was due to the phrase being deeply embedded within the sentence. As a modifier, really big would be an AP sister of an N' inside an NP which is part of a VP which is part of a sentence. Imagining this as a tree it should be easier to understand what ‘deeply embedded’ means.

### 8.7 Theoretical approaches

Though X-bar syntax underlies most theoretical approaches to syntax, the way in which the approach is used varies between the formal models that you find described in the literature. Before we look at the different roles that phrase structure can play in a theoretical model, I should point out that there is a family of models referred to as Dependency Grammar that does not represent phrases in this way. Instead they indicate dependency relations between
individual items; in a sentence such as *Oscar has tickled the boy*, *has* would have *tickled* as a dependent, *the* would be a dependent of *boy*, which would be a dependent of *tickled*, which would also have *Oscar* as a dependent. Using a notation where an arrow points towards the dependent element, we then get a representation like the one in (24) (details vary between different approaches to Dependency Grammar).

(24)

In this approach, there is no representation of constituency, but you can compare the element which has dependents to a head.

Returning now to approaches that do use X-bar syntax, I will first consider the analysis of clauses. In (23), I did not analyse the sentence as a whole and hence did not assign a category to it. So far, all phrasal categories I have considered have had a head, they have been endocentric. In early phrase structure analysis of English clauses, they were assigned to the category S(entence), which had two daughters, NP and VP. Since neither of the two daughters was the head, this was a non-headed, or exocentric, phrase. In more recent work, it has been argued that if you apply headedness tests to English clauses the conclusion is that the finite verb is the head. However, because of the special status of the finite verb, it is assigned to a separate category, usually I(nflation). This I forms an IP by taking the VP as its complement and the subject as its specifier. The resulting tree for *Oscar has tickled the boy* is provided in (25).

(25)

This analysis introduces a new functional category in addition to the traditional ones I referred to in §8.2. In some approaches to syntactic theory, the number of such functional categories has exploded over the last couple of decades, other theories take a more restricted approach. However, there is quite general agreement on three functional categories which can form phrases: I, D(eterminer) and C(omplementiser). For this reason, I have analysed that which I have previously referred to as NPs as DPs in (25), making D the head of the noun phrase. I referred to the difficulty in establishing which element is the head of the noun phrase in §8.3. The category C is used for clauses that are bigger than ordinary declarative clauses for instance clauses including a complementiser, such as ...whether Oscar has tickled the boy, or questions, such as *Who has Oscar tickled*.

The question now arises whether a tree similar to that in (25) is appropriate also for languages where constituency tests cannot be used to identify constituents the way they can
for English. In §8.5 I discussed languages that are non-configurational, either in that they lack evidence for a VP, or more radically, where it may be difficult to identify NPs. This is an issue where modern syntactic theories differ greatly. I will compare two types of theories here, the movement-based analysis of Minimalism and the parallel-correspondence approach of Lexical-Functional Grammar (LFG).

Within Minimalism, the tree structure is not just used to identify constituent structure, but more importantly to identify grammatical functions and semantic roles (see Chapters 28 and 30). In (25), we know it is Oscar who does the tickling and not the boy because of the position of the noun phrases; Oscar is the subject because it is in the specifier position of the IP. Within Minimalism, this is assumed to be universal, so that in Irish and Wambaya the subject must also occur in specifier of the IP. The fact that the surface structure of an example like (16) is so unlike that in (25) is assumed to be due to words and phrases having moved. This movement is triggered by the features of the linguistic elements. Within this theory there may then be a difference between the underlying and the surface structure (though this terminology is outdated). Minimalism also has a number of assumptions about phrase structure that distinguishes it from many other theories; all phrase structure is endocentric and binary branching, which means that a node always has two daughters exactly and that one of them is the head. Many more functional categories beyond C, I and D are used within Minimalism, so that (25) is likely to be simpler than a Minimalist analysis of the same sentence. These functional categories need not be filled by audible linguistic material, but can contain just a feature.

In LFG and other similar syntactic theories, phrase structure trees are used exclusively to capture the syntactic categories and constituent structure and the tree structure assumed for languages such as Irish or Wambaya is different from the one assumed for English in (25). Sentences in a language in which noun phrases form constituents, but there is no evidence of a VP, would have a structure like that in (26), where the clause is non-headed. Wambaya may have a representation such as the one in (27). Here the fact that there is a functional element firmly in second position is captured by the headed IP, and since any element can occur in the initial position, I have indicated that with the variable X. The otherwise free word order is captured through the category S with a number of daughters.

(26)  
```
      S
     /\   
    V   NP NP
```

(27)  
```
      IP
     /\  
    X   I'  
      \  
       I  S
```

The exact details of the appropriate trees for Irish and Wambaya are not at stake here. It is the general principle we are interested in. It will be clear from these two trees that there is no restriction to binary branching in LFG, and that constituents need not be endocentric. Functional categories tend to be used only when there is some functional feature which is clearly associated with a structural position, as is the case with the finiteness and agreement marker in Wambaya.
In LFG there is no universal link between a particular position in the tree structure and a specific grammatical function or semantic role. There is assumed to be some correspondence between the different dimensions of linguistic information, this is why the family of theories is referred to as parallel-correspondence architecture. Information from one dimension, say the syntactic structure or the morphology, is mapped onto another, the functional dimension. However, how this is done varies from language to language. In a relatively rigidly structured language like English the clue to what is the subject, or if you like, ‘who tickles who’, does lie in the structural position. However, in other languages, it may be a case marker, like the ergative marker in Wambaya, or an agreement marker on the verb. In these cases, there is a direct link between the morphological marker and the grammatical relation, without the element having to occur in a particular structural position that is not evidenced by the actual word order for it to be associated with the correct grammatical relation.

It will have been clear here that LFG does not assume that phrase structure has to be endocentric and binary branching. This has consequences also for English. Whereas a phrase consisting of a verb and two complements, such as give the dog a bone, is analysed in terms of binary branching within Minimalism, in LFG it would be represented as a VP with three daughters. Similarly, a coordinated phrase such as dogs and cats is assumed to have a head in a Minimalist analysis, but it is not in LFG.

Needless to say this brief comparison has involved great simplification. For a fairer and more complete picture, references in the further reading section can be followed up.

Notes

1 These are not the only first person pronouns in Vietnamese; different forms can be used depending on factors such as politeness and respect.

2 You do not really need to know the details of the glossing in order to understand the point made, but the abbreviations stand for the following grammatical terms: SG = singular, ACC = accusative case, ERG = ergative case, F = feminine gender, II = noun class II, A = transitive subject, PST = past tense, INF = infinitive verb form.

Further reading

For more detail on the first five sections with respect to English, consider a simple introduction to English grammar such as Börjars and Burridge (2010) or the most comprehensive grammar of English extant, which is Huddleston and Pullum (2002). If you prefer a similar introduction based on a typologically broader data set, Payne (1997) and Kroeger (2005) are both very good. What I have presented here is a vastly simplified account of the different theoretical approaches, for a fuller picture see Adger (2003) for Minimalism and Dalrymple (2001) for LFG. Shorter accounts of a number of theories which share some crucial properties with LFG can be found in Borsley and Börjars (2011). Carnie (2008) provides an extensive introduction to X-bar syntax and its implementation in different theories. If you would like to understand Dependency Grammar, Hudson (2010) provides an introduction to Word Grammar, which is dependency-based. Given the variety of theoretical approaches to phrase structure, you will not be surprised to discover that the analysis of language data can give rise to different conclusions. For two different interpretations of the Irish data, see McCloskey (1983) and Carnie (2005).

References


