CHAPTER 5

SYNTAX

V SYNTAX

Overview:

As we discussed in chapter 1, one of the basic questions in linguistics is: What is knowledge of language, i.e. what do speakers know when they know a language? So far we have discussed knowledge of (i) meaning and meaning in context (semantics/pragmatics), (ii) sounds and combinations of sounds (phonetics/phonology), (iii) words and word formation (morphology). An important additional kind of knowledge speakers have is still missing at this point. To communicate, we generally do not simply use individual words in isolation but we combine words to form sentences. Sentence formation is not a random process, and speakers therefore must have some knowledge on how to form sentences. In the field of syntax, the aim is to determine the exact nature of this type of knowledge. Syntax is the study of sentence formation and deals with issues such as word order, the structure of sentences and the way sentence structure determines interpretation.

An initial observation that we made concerning sentences in chapter 1 (pp. 6-8) is that it cannot be the case that speakers memorize all the sentences of their language. This is because the number of possible sentences is far too high for memorizing to be possible and because we can produce and understand sentences that we may never have heard before. Instead of memorized sentences, a speaker's knowledge about sentences must consist of basic patterns and rules that can be used to form and understand an unlimited number of sentences. In this chapter, we will consider some aspects of these rules that constitute a speaker's knowledge of sentence formation.

1. WORDS: SYNTACTIC CATEGORIES

The basic unit within a sentence is the word. Among words, we have to distinguish different classes. These distinctions are important because the class a word belongs to determines the position in which it can occur within a sentence. Consider for example the following sentences.

(1) a. They will destroy the building.
b. * They will destruction the building.
c. I read an interesting book.
d. * I read an interestingly book.

The only difference between the grammatical sentence (1a) and the ungrammatical one in (1b) is that the word *destroy* has been replaced by the word *destruction*. This suggests that only the word *destroy* is of the right type to occur in the position between *will* and *the* in (1a/b). The relevant type here is verb. We can insert verbs like *destroy*, *renovate* or *draw* between *will* and *the* but not nouns like *destruction* or *renovation*. Labels such as verb or noun are called **syntactic categories**, sometimes also **grammatical categories**, **word classes** or **parts of speech**. Here, we will generally use the first term. The importance of category membership of a word on its distributional properties is also shown in examples (1c/d). This pair of examples shows that between *an* and *book* only a member of the category adjective is grammatical (*interesting*) whereas an adverb like *interestingly* in this position leads to an ungrammatical result.

In earlier chapters, we have often referred to terms such as verb, noun or adjective because, intuitively, we can generally tell whether something is a verb or a noun or an adjective. However, linguistics being the scientific study of language, intuition is not a sufficient basis for classifying items. Instead, we must try to identify exact criteria that we can use to determine the syntactic category of a word. There are two main types of criteria that are valid tests for category membership:

(i) **Distributional** properties: The position a word can occupy in a sentence (cf. example 1).
(ii) **Morphological** properties: The kind of morpheme(s) a word can be combined with.

Below, we will illustrate these criteria for different types of categories. But before doing so, we should point out that it is sometimes claimed that category membership can be determined on the basis of semantic properties. Thus, nouns are said to refer to persons, things or places, whereas verbs refer to actions or states. Although this may often be true, semantic properties are not reliable criteria for determining syntactic categories. Consider for example the syntactic category noun. *Child* refers to a person, *table* refers to a thing, and *corner* refers to a place. But there is a wide range of additional meanings that nouns can express. *Destruction* is an action, *way* is a path, *whiteness* is a quality, *mile* is a measurement, *fool* (as in *He is a fool*) is a category/kind, *meeting* is an event, or *square root* is an abstract concept. Note that it would not be sufficient to simply extend the range of semantic fields in our semantic definition of noun on the basis of the nouns just cited. For example, if we said that, in addition to person/thing/place, nouns can also refer to actions, we would be able to include *destruction* among the class of nouns, but we would not be able to make a distinction between *destruction* and *destroy* any more because *destroy* also refers to an action. In other words, a semantic property like ‘action’ would not allow us to attribute exact category membership to a word because it could be both a verb or a noun. Semantic criteria are therefore not considered as reliable tests for determining the categorial status of a word. A syntactic category is not a kind of meaning but an item that obeys certain formal rules concerning distribution and morphology.

What follows is a list of the main syntactic categories. In addition, we will provide the distributional and morphological properties that characterize each category (distributional properties in (i), morphological properties in (ii)).

- **Noun** (abbreviation: **N**) (e.g. *tree, cat, idea* etc.)
  (i) Nouns can be preceded by articles (*the tree, a cat*), possessive modifiers (*my tree, your cat*), demonstratives (*this tree, that cat*) or quantifiers (*some trees, each cat*). They can also be modified by adjectives (*the big tree, a black cat*).
  (ii) Nouns can generally be marked for plural (e.g. *tree**s**, cat**s**, match**es**, child**ren***). Furthermore, they can also be inflected for Genitive (*the tree's, the cat's*).

- **Adjective (A)** (e.g. *tall, beautiful* etc.)
  (i) Adjectives can precede a noun when they are attributive (i.e. when they modify a noun). In such cases they may also follow an article, possessive pronoun, demonstrative or quantificational word (*a nice tree, his new shoes, that black cat, some new books*). Adjectives can also be predicative. In these uses, they generally co-occur with the verb *be* (*The tree is nice.*). Adjectives can also be modified by degree adverbs (*very nice, quite expensive*).
  (ii) Adjectives can be marked for comparative and superlative. The morphological marking may be realized as a bound morpheme (*-er* or *–est* as in *tall-er, tall-est*), but it can also appear as a free morpheme (*more* or *most* as in *more expensive, most expensive*).

- **Adverb (Adv)** (e.g. *clearly, nicely, fast* etc.)
  (i) Like adjectives, adverbs can be modified by degree adverbs (*very gladly, quite surprisingly*). But in contrast to adjectives, adverbs cannot modify nouns (cf. 1d). Instead, they generally modify verbs (*laugh furiously*) or entire sentences (*Usually, we meet on Fridays*.). Sometimes, they also modify adjectives (*surprisingly quick*) or other adverbs (*surprisingly quickly*).
  (ii) Adverbs cannot be combined with any inflectional morphemes (comparatives and superlatives are formed with the free morphemes *more/most*). They frequently contain the derivational morpheme *–ly*.

- **Verb (V)** (e.g. *walk, invite, play, write* etc.)
  (i) A basic property of verbs is that they can co-occur with an auxiliary verb (e.g. *She will walk, He has invited her, They were playing, You should write to them*).
  (ii) Verbs can be inflected for **tense** (past tense *walked, invited, played, wrote*). In addition, they can be inflected for **subject-verb agreement** (sometimes also called subject-verb concord). Two elements are said to agree if they have at least one grammatical feature in common. The relevant features for subject-verb agreement are person (1^{st}, 2^{nd}, 3^{rd}) and number (singular, plural), that is, the verb's inflection agrees with the person/number features of the subject. In English, subject-verb agreement morphology is very impoverished. An agreement morpheme can only be found on verbs in the present tense with 3^{rd} person singular subjects (*he/she/it get-s*).

    Inflection for tense or agreement is a property of **finite** verbs. But verbs can also occur in **non-finite** forms. Past participles (*walked, invited, played, written*) and gerunds/present participles (*walking, inviting, playing, writing*) are inflected non-finite

verb forms. Finally, the uninflected non-finite verb can co-occur with *to* (*to walk, to invite*).[1]

- **Preposition (P)** (e.g. *during, on, before* etc.)
  (i) Prepositions can be followed by an article and a noun or simply a noun (*during the break, on time*). Some prepositions can also precede an entire subordinate clause (*… before [Bob had left]*).
  (ii) Prepositions do not have any morphologically distinctive properties.

- **Determiner (D)** (e.g. *the, a, that, this, my, some, each* etc.)
  (i) Determiners precede nouns, or, if the noun is modified by an adjective, they precede the sequence 'adjective-noun'. Note that different types of determiners can be distinguished: (a) articles (definite *the* and indefinite *a*); (b) demonstratives (*this, these, that, those*); (c) possessive determiners (*my, your, his* etc.); (d) quantificational determiners (*some, each, every*). The reason why we include all these words in the category D is that they have the same distributional properties: They can all precede 'A-N' sequences (*the/a/that/this/my/your/each new car*) and they are all in complementary distribution (**the this new car, *the my new car, *that his new car, *his each new car*). Complementary distribution suggests that these elements all occupy the same position within the sentence structure.
  (ii) Determiners do not have any morphologically distinctive properties.

- **Complementizer (Comp or C)** (e.g. *that, if*)
  This category is sometimes also called 'subordinating conjunction' in grammars.
  (i) Complementizers introduce subordinate clauses (*I think that [he left yesterday], I wonder if [he has left already]*).
  (ii) Complementizers do not have any morphologically distinctive properties.

[1] The **finite/non-finite distinction** with verbs can often be made on the basis of the morphological properties discussed in the text (e.g. *gets* is finite because of the *–s* agreement morpheme, whereas *getting* is non-finite because of the *–ing* ending). However, morphology alone is not always sufficient to determine whether a verb is finite or non-finite. For example the uninflected verb *get* could be a finite verb in the present tense with any kind of subject except for a 3rd person singular subject (ia), but it could also be a non-finite verb (ib).

(i) a. They get up early.
    b. She helped him get a job

If the morphology in a given sentence is not conclusive, there are three possible ways to determine whether we are dealing with a finite verb or a non-finite verb: (a) Try to replace the verb by a clearly finite form. If this is possible, the verb is finite. If this is not possible, the verb is non-finite. In (ia), it would be possible to say *They got up early*, or, with another subject, *He gets up early*. In (ib), however, it would never be possible to use the past tense form (e.g. **She helped him got a job*), nor would it be possible to add an agreement morpheme (e.g. **She helped him gets a job*). (b) If the verb has a subject, the subject must be in the nominative case form with a finite verb (*I, she, he, we, they*) whereas it cannot be in the nominative case form with a non-finite verb. Instead, the Accusative (or objective) case form is used (*me, her, him, us, them*). For example in (ia) we have nominative *they*, whereas in (ib) we have accusative *him* (vs. **She helped he get a job*). (c) Finally, while a clause with a finite verb can stand alone as a main clause (cf. ia), a clause with a non-finite verb cannot (cf. **Him get a job*). Instead, the presence of a non-finite verb form always implies the presence of another (i.e. a finite) verb (*helped* in ib).

- **Auxiliary (Aux)** (e.g. *have, be, can, will* etc.))
  (i) The basic distributional property of auxiliaries is that they generally co-occur with verbs. Furthermore, they precede negation (*I have not (haven't) seen him, I would not (wouldn't) do this*) and they precede subjects in questions (*Have you seen him? Would you do this?*).
  (ii) Auxiliaries can be inflected for tense (*had, was, could, would*) and agreement (*have/has, am/are/is/was/were*). However, as we will see in more detail in chapter 6, there is a subclass of auxiliaries whose tense inflection often does not express semantic tense any more (*I wouldn't do this* – no past tense meaning) and which are not inflected for agreement (*can, will, shall* etc.). These auxiliaries are called **modals**.

- **Conjunction (Co)** (e.g. *and, or, but*)
  (i) Conjunctions join words or phrases of the same category (*[papers] and [magazines]*; *[I talked to Mary] and [she agreed with us]*)
  (ii) Conjunctions do not have any morphologically distinctive properties.

To these major categories, grammars sometimes also add some minor ones such as **numeral** (*one, two, three*) or **interjection** (*oh, ah, phew*). Furthermore, the above categories are sometimes divided into subclasses. We have already seen such subdivisions with determiners (articles, demonstratives, possessives, quantifiers) and with auxiliaries (modals vs. other auxiliaries). Further subdivisions are also often made with adverbs (e.g. degree adverbs, sentence adverbs, manner adverbs etc.), nouns (e.g. mass nouns, count nouns – cf. chapter 2, pp. 29/30), or verbs (e.g. intransitive verbs, transitive verbs, ditransitive verbs – cf. section 3 below).

One additional remark concerning the criteria used for determining category membership should be added here. The fact that certain categories such as P, D, Comp and Co do not have any morphologically distinctive properties implies of course that in order to attribute category membership to a given word we do not necessarily have to use both distributional and morphological evidence. Distributional evidence is relevant for all categories, morphological tests can then further support category membership at least with some categories. Note that, even when words of a category typically combine with a given morpheme, it is not always the case that each member of this category must be able to do so. Consider for example the category N. We observed above that nouns can typically carry plural morphology. But as we saw in chapter 2 (pp. 29/30), there is a class of nouns, namely mass nouns, which generally do not occur in the plural (e.g. *information, furniture* vs. **informations, *furnitures*). From a distributional point of view, mass nouns clearly have the properties of nouns (e.g. occurring after determiners *this information, my furniture*) and they also share the morphological property of other nouns of being able to be inflected for Genitive (e.g. *this furniture's design*). We therefore consider mass nouns as belonging to the category of noun even though they do not combine with all morphemes that other nouns can combine with. This morphological gap is not due to their being part of a substantially different syntactic category but due to the semantic incompatibility of mass and plurality. These observations confirm that distributional

criteria are essential for determining category membership and that morphological criteria then often, but not always, provide further evidence for category membership.

We conclude our discussion of syntactic categories, by introducing one further type of classification. The syntactic categories listed above are often divided into two groups:

(a) **Lexical** categories (V, N, Adj, Adv, P).
(b) **Functional** categories (D, C, Aux, Co).

This distinction is based on the following differences between the two types of categories: (i) Lexical categories are **open-class**, that is the number of items belonging to this category is not limited. You can always invent a new verb or a new noun. Functional categories, however, are **closed-class**. No new members are generally added to closed-class categories. The category D for example contains a very limited number of words and this number has been stable for several centuries. The same observations can be made for complementizers, auxiliaries and conjunctions.[2]

Another difference between lexical categories and functional ones concerns their semantics. Lexical categories are generally semantically rich. For example, verbs can express a wide range of meanings. Related to this semantic richness is the fact that words belonging to lexical categories are often able to assign thematic roles (cf. chapter 2, pp. 39/40, and section 3 below). Functional categories, however, are semantically less rich and they never assign thematic roles. They generally simply express grammatical properties like definiteness/ indefiniteness (determiners) or tense (auxiliaries).

You can now do exercises 1 to 6.

2. SYNTACTIC STRUCTURE

Let us now move beyond words and consider how they combine to form sentences. The simplest assumption for sentence formation would be that words are combined in the same way we string beads together to form necklaces. Just as one bead follows another on the string, one word would follow another in a particular linear order, which is expressed in either time (speech) or space (writing). Linear order certainly does play a role in sentence formation as the contrast between *He will talk to us soon* and *Will he talk to us soon?* suggests. The difference between a simple statement and a question lies in the order of the auxiliary and the subject. But linear order is not sufficient to account for sentence formation. Instead, words combine to form larger units and these larger units are then combined to form a sentence.

There are various pieces of evidence suggesting that sentences are structured. Here, we will discuss two of them, namely structural ambiguity and a set of tests showing that certain strings of words form units.

[2] One category whose status in terms of the lexical/functional distinction has remained controversial is the category preposition. Some linguists consider P as lexical, others consider it as functional. We include it here among the lexical categories. Although it is true that it is rare for new prepositions to be added to a language, one could nevertheless easily imagine creating new prepositions, e.g. to express different types of closeness relations.

2.1. Structural ambiguity

The following sentence is ambiguous:

(2) Bob saw the old teacher with the glasses.

The two interpretations of (2) are given in (3).

(3) a. Bob saw the old teacher who was wearing glasses.
b. Using the glasses, Bob saw the old man.

We can observe that for both interpretations there is no difference in the meaning of the individual words. In other words, we do not have a lexical ambiguity here (cf. chapter 2, pp. 26/7). Instead, the ambiguity in (2) depends on how the words are grouped together in the interpretation. In (3a), *with the glasses* says more about *the old teacher*. In (3b), *with the glasses* says something about how Bob *saw the old teacher*. We thus have a case of *structural* ambiguity (cf. also chapter 2, pp. 46/7). Structural ambiguities arise because the grammar allows the subunits contained in a sentence to be grouped in more than one way. Structural ambiguity therefore provides evidence for syntactic structure. If sentences were simply strings of words without further structure, we could not account for the different interpretations of (2).

Note that the phenomenon observed here is comparable to that discussed in the context of compounding in chapter 4 (p. 153). We saw that a compound like *English language degree entrance requirement* can be interpreted in more than one way and that this ambiguity can be explained in terms of how we group the different words in the compound (cf. the different structures on p. 153). For ambiguities at the level above the word as illustrated in (2), we will provide a structural analysis comparable to that proposed for compounding later in this chapter.

2.2. Words ‘belonging together’ – constituency tests

Speakers of a language have intuitions as to which words in a sentence belong together and which do not. Consider the following sentence.

(4) The old teacher will write his favourite example on the board.

For example *his* belongs together with *favourite example* but not with *write*. Or *on* belongs together with *the board* but not with *example*. *His favourite example* and *on the board* each form a syntactic unit called a **constituent**. A constituent is a group of words which constitute a syntactic entity, that is, exhibit a syntactically determined behaviour. This means that a group of words forms a constituent if it can be subject as a whole to syntactic manipulations, such as moving around, being replaced by another word, and the like. These manipulations are usually called constituency tests. Note that the word “test” can be misleading. The

manipulations are not lab tests through which any constituent should pass. Simply, these tests are possible variants of a sentence, which are recognized as grammatical by native speakers. We will consider six of these manipulations, which can help you determine whether a given unit in the sentence is a constituent, i.e. exhibits the behaviour of a recognized syntactic unit.

2.2.1. *Substitution*

Substitution is a manipulation which enables one to replace a unit by an adequate shorter form, a pro-form. For example, units which contain a noun are replaceable by pronouns (5a/b), and units containing a preposition may be replaceable by adverbs (5c).

(5) a. HE will write his favourite example on the board.
b. The old teacher will write IT on the board.
c. The old teacher will write his favourite example THERE.

The substitution of *the old teacher* by *he* shows that *the old teacher* must be a constituent. Similarly, the substitution of *on the board* by *there* means that *on the board* forms a syntactic unit. Note that substitution operates only on constituents. Nothing shorter can be the target of substitution (6), and nothing longer either (7).

(6) * The old HE will… (*he = teacher*)

(7) * The old teacher will write IT the board. (*it = his favourite example on*)

A particular type of substitution, *do so* substitution, allows us to show that the verb and constituents following it also form constituents. *Do so* substitution isolates the verb and what follows it from the auxiliary. Consider (8):

(8) a. The old teacher will write his favourite example on the board and his young student will **do so, too**. (*do so = write his favourite example on the board*)
b. * The old teacher will write his favourite example on the board and his young student **does so, too**. (*does so = will write his favourite example on the board*)

We notice that in the process of substitution, the auxiliary *will* cannot be replaced. (8b) is ungrammatical. So while the verb and the constituents which follow it do form a larger constituent, the auxiliary cannot be included and is part of a separate unit.

2.2.2. *Clefting*

Clefting isolates a constituent by moving it to the beginning of the sentence in a construction of the type *it is* _[constituent]_ *that/who* ___. This results in a special emphasis on the constituent:

(9) a. It is THE OLD TEACHER who will write his favourite example on the board.
b. It is HIS FAVORITE EXAMPLE that the old teacher will write on the board.
c. It is ON THE BOARD that the old teacher will write his favourite example.

Again, clefting can only manipulate units which form a constituent. Nothing smaller can be clefted (10), and nothing bigger (11).

(10) a. * It is THE OLD who teacher will write his favourite example on the board.
b. * It is ON that the old teacher will write his favourite example the board.

(11) * It is HIS FAVOURITE EXAMPLE ON that the old teacher will write the board.

2.2.3. *Questions*

A constituent can be questioned. This means that a constituent can be replaced by a question word.

(12) a. WHO will write his favourite example on the board?
- The old teacher.
b. WHAT will the old teacher write on the board?
- His favourite example.
c. WHERE will the old teacher write his favourite example?
- On the board.

Once again, we can show that the target of the question can only be a constituent:

(13) a. * The old WHO will write his favourite example on the board?
- Teacher. (→ not a constituent)
b. * WHAT will the old teacher write the board?
- His favourite example on. (→ not a constituent)

2.2.4. *Deletion*

A constituent can (theoretically) be omitted, or deleted:

(14) a. The old teacher will write his favourite example.
b. The teacher will write his favourite example on the board.

(14a) shows that *on the board* is a constituent, which was also shown by the previous tests. (14b) reveals that the adjective *old* also forms a constituent. However, deletion is subject to important constraints:

(15) * will write his favourite example on the board.

Example (15), although ungrammatical, should not lead us to the conclusion that *the old teacher* is not a constituent. A stronger constraint, which bans deletion of subjects in general in English, overrides the deletion "test".

2.2.5. *Movement*

A unit which forms a constituent can be moved, provided that this movement does not violate other constraints:

(16) ON THE BOARD, the old teacher will write his favourite example.

Again, movement can affect only whole units:

(17) a. * ON THE, the old teacher will write his favourite example board.
b. * HIS FAVOURITE EXAMPLE ON, the old teacher will write the board.

Note that the "other constraints" mentioned before example (16) include the fact that in English, the direct object (cf. section 3 below) does not easily move away from the verb. Preposing of the object yields a special (often contrastive) interpretation:

(18) HIS FAVOURITE EXAMPLE, the old teacher will write on the board. (… but the example he hates he will write on a piece of paper.)

2.2.6. *Pseudo-clefting*

Like *do so* substitution (cf. section 2.2.1), pseudo-clefting can be used to identify constituents formed with the verb (19a/b). However, pseudo-clefting is not limited to verbal constituents (19c). The basic pattern of pseudo-clefting is of the type *what __ V/Aux is* _[constituent]_. Like clefting, pseudo-clefting is a process that results in emphasis on a constituent.

(19) a. What the old teacher will do is WRITE HIS FAVOURITE EXAMPLE ON THE BOARD.
b. * What the old teacher does is WILL WRITE HIS FAVOURITE EXAMPLE ON THE BOARD.
c. What the old teacher will write on the board is HIS FAVOURITE EXAMPLE.

(19b) again shows that the auxiliary is not part of the constituent formed by the verb (cf. also 8b).

2.2.7. *A note of caution*

Sections 2.2.1 to 2.2.6 have shown different tests allowing us to identify constituents within a sentence. However, it is important to stress that for a sequence of words to be identified as a constituent it does not have to successfully "pass" all the six tests discussed. As already pointed out in section 2.2.4, for example the fact that some sequences of words such as *the old*

teacher in (4) cannot be deleted should not be taken as meaning that *the old teacher* is not a constituent. Instead, it is generally sufficient if at least one of the constituency tests identifies a string of words as a constituent.

Most of the time, constituents can indeed be identified on the basis of at least one of the tests discussed above. Occasionally, however, some further reasoning may be needed to conclude that something is a constituent. Let us start by reconsidering our sentence *The old teacher will write his favourite example on the board*. As the substitution and question tests in (20) show, the constituent *on the board* contains another constituent, namely *the board*.

(20) a. The old teacher will write his favourite example on IT. (*it = the board*)
b. What will the old teacher write his favourite example on? - The board.

But consider now a similar sentence where *on the board* is replaced by a time information like *on Monday*.

(21) The old teacher will read his favourite example on Monday.

If we apply the same tests as in (20) plus the additional ones in sections 2.2.2, 2.2.4, 2.2.5 and 2.2.6, we obtain ungrammatical results.

(22) a. * The old teacher will read his favourite example on IT/THEN.
b. * What/when will the old teacher read his favourite example on? – Monday.
c. * It is Monday that/when the old teacher will read his favourite example on.
d. * The old teacher will read his favourite example on.
e. * Monday, the old teacher will read his favourite example on.
f. * What the old teacher will write his favourite example on is Monday.

Do we have to conclude that *Monday* is not a constituent in (21)? This would clearly not be plausible. Note first of all that, although we have focused on sequences of words so far, single words can of course also form constituents. If we say *Peter will write his favourite example on the board*, the word *Peter* plays exactly the same role within the syntactic structure as the sequence *the old teacher* in *The old teacher will write his favourite example on the board*. Single word constituents are therefore possible. Furthermore, *Monday* can form a constituent, as (23) shows.

(23) a. THE FIRST DAY OF THE WEEK was a great day.
b. MONDAY was a great day.
c. IT was a great day. (*it = the first day of the week* in 23a or *Monday* in 23b)

The status of *Monday* as a constituent in (21) can now be derived by analogy. From (20), we know that the preposition *on* can be followed by a constituent. From (23), we know that *Monday* can be a constituent. We therefore conclude that *Monday* must be a constituent in (21). This is confirmed by the fact that *Monday* can be replaced by other units that have the

status of constituents in other contexts. For example, the constituent *the first day of the week* identified in (23a) can also occur after the preposition *on*, as in *The old teacher will write his favourite example on the first day of the week*.

To conclude, it should be pointed out that cases like the one discussed in (21) to (23) are relatively rare. In general, constituents can be determined fairly straightforwardly on the basis of one or several of the tests discussed in sections 2.2.1 to 2.2.6.

2.2.8. *Ambiguity revisited*

Having discussed different constituency tests, we can now briefly reconsider the ambiguous sentence (2), repeated here as (24).

(24) Bob saw the old teacher with the glasses.
Paraphrase 1: Bob saw the old teacher who was wearing glasses.
Paraphrase 2: Using the glasses, Bob saw the old man.

In section 2.1, we observed that the ambiguity of (24) must be due to the way the words in this sentence are grouped together. One possibility is that *with the glasses* modifies *the old teacher* (paraphrase 1). Another possibility is that *with the glasses* modifies *saw the old teacher* (paraphrase 2). Constituency tests can now reveal the nature of the ambiguity in a more precise way. (25) illustrates substitution, (26) clefting, (27) questions and (28) deletion:

(25) a. Bob saw HIM. (*him = the old teacher with the glasses*)
b. Bob saw HIM with the glasses. (*him = the old teacher*)

(26) a. It is THE OLD TEACHER WITH THE GLASSES that Bob saw.
b. It is THE OLD TEACHER that Bob saw WITH THE GLASSES.

(27) a. WHO did Bob see? - The old teacher with the glasses.
b. WHO did Bob see with the glasses? - The old teacher

(28) a. * Bob saw. (deletion: *the old teacher with the glasses*)
b. Bob saw the old teacher. (deletion: *with the glasses*)

The constituency tests show that *the old teacher with the glasses* can form one large constituent (the (a) examples in (25) to (28)). This structure corresponds to paraphrase 1. Alternatively, *the old teacher* and *with the glasses* can be identified as two independent constituents (the (b) examples in (25) to (28)). This structure corresponds to paraphrase 2. Thus, constituency tests allow us to show the different ways in which words are grouped in structurally ambiguous sentences.

You can now do exercise 7.

3. SUBCATEGORIZATION AND THEMATIC ROLES

3.1. Subcategorization

We have seen that words, which belong to different classes, combine into larger units to form constituents. The next point we will consider is how words can impose constraints on the number and the nature of the other constituents contained in a sentence. Let us start with verbs. Consider the examples below:

(29) a. Bob saw the old teacher.
b. * Bob saw.
c. * Bob saw the old teacher the classroom.
d. * Bob saw in the classroom.

One of the characteristics of verbs is that they can be followed by a nominal constituent, i.e. what we call a noun phrase or, abbreviated, an NP.[3] We will say that a verb like *see* **subcategorizes for** a nominal constituent (or **selects** a nominal constituent). This constituent, which is selected, is the **complement** of the verb. If there is no nominal complement as in (29b) or if there is more than one nominal constituent following the verb as in (29c), the sentence is ungrammatical. Furthermore, if there is one constituent following the verb but it is not an NP, we also obtain an ungrammatical result, as in (29d) where we have a preposition preceding the nominal constituent. The verb *see* is a **transitive** verb, which means that in fact it has to be followed by one complement.

Whereas *see* subcategorizes for an NP, there are also verbs selecting other types of complements. In (30), *account* selects a prepositional constituent (or a prepositional phrase, abbreviated as PP) and in (31) *wonder* selects a sentential complement (a subordinate clause). We will also classify verbs like *account* and *wonder* as transitive verbs.[4]

(30) a. They accounted [for this].
b. *They accounted.

(31) a. Bob wonders [if there is some yoghurt in the fridge].
b. * Bob wonders.
c. * Bob wonders [the presence of yoghurt in the fridge].

Not all verbs are transitive, that is, not all verbs subcategorize for a complement. The verb *sleep*, for example, does not require a complement. In fact, a complement is prohibited:

[3] The term *phrase* refers to a constituent in English (and not to the same thing as the French word *phrase*!). Cf. section 5 below for a more extensive discussion of phrases and their structures.
[4] Note that grammars may vary in the way they use the term "transitive verb". In some grammars, only verbs that select an NP complement are called transitive verbs (cf. e.g. Huddleston & Pullum 2002:296ff.). Other grammars, however, use the term more generally for all verbs that subcategorize for some constituent regardless of what the nature of this constituent is (cf. e.g. Quirk et al. 1985:1176ff.). We are adopting the second option here.

(32) a. Bob slept.
b. * Bob slept his bed.

The verb *sleep* is **intransitive**. It does not subcategorize for a complement.

Some verbs can select more than one type of complement. *Think* is an example of such a verb. It subcategorizes either for a prepositional complement as in (33a) or for an entire subordinate clause as in (33b).

(33) a. Basil may think [about John's proposal].
b. Basil may think [that John's proposal is unacceptable].

Finally, there are also verbs such as *put* or *give* which require two complements. These are called **ditransitive** verbs.

(34) a. Basil put [the cat] [on the mat].
b. * Basil put the cat.
c. * Basil put on the mat.

(35) a. The old teacher gave [Basil] [a long homework].
b. * The old teacher gave Basil.

Note that in English some ditransitive verbs appear with two different possible structures. In (35a), the two complements are both NPs. But there is an alternative to (35a), namely (36), where one of the complements is a nominal constituent and the second one is a prepositional constituent.

(36) The old teacher gave [a long homework] [to Basil].

Such an alternation does not exist for example in French, where only the equivalent of (36) is possible. (35a), with the two nominal complements, is attested in Germanic languages such as German. This is known as the **double object construction**.

The selectional properties of a verb are expressed in what is referred to as the **subcategorization frame** of the verb. The subcategorization frame can be represented as in (37).

(37) a. *see*: V, [__ NP]
(*see* is a verb (V), and it takes one complement, a nominal constituent (NP))
b. *sleep*: V [__]
(*sleep* is a verb, and it takes no complement)
c. *give*: V [__ NP, NP] or V [__ NP, PP]
(*give* is a verb, and it takes two complements, either two nominal constituents (NP), or a nominal constituent (NP) and a prepositional constituent (PP))

3.2. Thematic roles

The influence verbs have on what is contained within a syntactic structure can also be expressed with reference to the semantics of the verb. This is a point we have already discussed briefly in chapter 2 (p. 39ff.). Consider the following sentences:

(38) a. # Bob startled the yoghurt.
b. # The mat loves pizza.

Sentences (38a) and (38b) are grammatical, in the sense that both transitive verbs (*startle* and *love*) are followed by a complement. However, these sentences are semantically odd (hence the diacritic #). What is the problem?

The activity described by the verb involves a certain number of participants. These participants are the **arguments** of the verb. In (38a), for example, the verb *startle* takes two arguments, one of which will take up the role of the startled entity, and the other one the entity which causes the startling. The roles of the arguments are formally expressed as **thematic roles** and are assigned by the verb. Obviously, the notion of thematic role is related to the meaning of the verb. We need to know what the verb means in order to be able to decide what kind of role the arguments will play.

The notion of thematic role is therefore distinct from the purely syntactic notion of subcategorization we have discussed above. However, both notions contribute to the well-formedness of a sentence. Let us take an example. In (39) below, the verb *see*, a transitive verb, subcategorizes for a complement. This complement is realized as *a cat*.

(39) Bob saw a cat.

Note that the subcategorization frame of the verb does not say anything about the content (i.e. the meaning) of the complement. It simply says that this verb needs a nominal complement. The subcategorization frame also does not say anything about the subject. There seems to be a separate constraint on sentences, which requires that they have a subject. So from a purely syntactic point of view, all we know is that a verb like *see* has to co-occur with a subject and a complement. This means two arguments.

We now need the process of thematic role assignment to make sure that the arguments which are realized are coherent with the verb's meaning. From a semantic point of view, a verb like *see* assigns a thematic role which expresses the fact that someone/something (animate) is doing the seeing, and another thematic role which expresses the object of the seeing. These two thematic roles, that of agent and theme, are assigned to the subject and the complement:

(40)

Bob	saw	a cat
[agent]		[theme]

So thematic roles are assigned by the verb and there is a correlation between the assignment of thematic roles and the presence of arguments: If a verb selects a complement, the latter is an argument which has to receive a thematic role. The **Thematic Criterion** (Theta-Criterion) formalizes this correlation:

(41) **Thematic Criterion**
Each argument receives one and only one thematic role.
Each thematic role is assigned to one and only one argument.

We have seen that verbs assign thematic roles to their arguments, that is their selected complements and the subject. One question we might ask now is whether all verbs assign thematic roles. Consider (42):

(42) a. Bob slept.
b. Bob was sleeping.
c. Bob should sleep.

All the examples in (42) contain the verb *sleep*. In (42a), the subject is the only argument. In (42b) and (42c), we have the same verb *sleep* plus an additional auxiliary verb. But we still have only one argument, namely *Bob*. We know that an argument can receive only one thematic role (cf. 41). The conclusion is therefore that auxiliaries do not assign thematic roles. This property is related to the fact that the meaning of auxiliaries is rather limited. In particular, auxiliaries do not refer to any kind of action or state, and they therefore cannot introduce any additional arguments apart from those already determined by the meaning of the verb. Hence, only lexical verbs assign thematic roles.

A second question we should ask is whether only verbs assign thematic roles. The following types of examples are relevant here.

(43) a. Basil is young.
b. Basil is a student.

In (43), the only verbal element is *be*. *Be* is not a true auxiliary here because it does not co-occur with a lexical verb. On the other hand, it does not really look like a lexical verb either. Semantically, it is to a large extent empty. The only thing *be* does in this case is establish some kind of equation between the subject *Basil* and the adjectival constituent *young* or the nominal constituent *a student*. The sentences could be rewritten as:

(44) a. Basil = young
b. Basil = a student

Therefore, *be* is not considered as a lexical verb. It is a **copula**. Because it does not have a strong lexical content, the copula does not assign a thematic role (like auxiliaries). But recall now that arguments need a thematic role. So where does the thematic role of *Basil* come from

in (43)? In (43a), the only possibility is that it comes from the adjective, which functions, like lexical verbs in other sentences, as the **predicate** and takes an argument, to which it assigns a thematic role. Similarly, *a student*, in (43b) functions as a predicate and assigns the thematic role to *Basil.* So the answer to our second question is that not only verbs, but all the elements which function as predicates, like predicative adjectives or nouns, assign thematic roles.

The next question we might consider is whether, as in the examples (40), (42) and (43), thematic roles are always assigned to nominal constituents. The subcategorization frames in (37) show that this is not the case. A verb like *give* selects two complements. They are arguments and are assigned thematic roles (theme and goal), but, as shown in (36) and (37c), the role of goal can be assigned to a prepositional constituent (PP) rather than a nominal one. Furthermore, an entire clause can also be assigned a thematic role. This is illustrated in (31a), where the complement of *wonder* is an indirect question introduced by the complementizer *if*.

The final question we consider is whether all nominal constituents receive a thematic role. The answer seems to be negative. Consider example (45).

(45) It seems that the old teacher likes Basil.

The subject of *seem* is *it.* However, *it* does not really have a meaning. It does not refer to any entity. Rather, it functions as a mere "place holder", sitting in the subject position, but not satisfying any of the semantic requirements ordinary arguments have. In fact, it can be dispensed with:

(46) The old teacher seems to like Basil.

(46) is more or less equivalent to (45), with the same verbs. If *it* really had a thematic role, it would not be possible to eliminate it. We conclude that a non-referential subject like *it* does not receive a thematic role. It is referred to as a "dummy *it*" or as an **expletive.**

Similarly, the subjects of weather verbs as illustrated in (47) have no real semantic content and therefore do not receive a thematic role.

(47) a. It is raining. b. It is cold.

Finally, we can also find nominal constituents that do have meaning but that are nevertheless not arguments. This is shown in (48).

(48) [Last month], John bought a new car.

The verb *buy* assigns two thematic roles, an agent role and a theme role. The nominal constituent *last month* is not a participant in the activity described by the verb but it simply provides information on when the activity took place. It is therefore not an argument and does not get a thematic role.

You can now do exercises 8 and 9.

4. GRAMMATICAL FUNCTIONS

Section 3 focussed on the influence the verb (or more generally the predicate) has on what other constituents are contained in a sentence. In this section, we will have a closer look at the main constituents within the sentence structure and the role they play from a grammatical point of view. Two main distinctions will be made, the one between complement and adjunct, and the one between subject and object.

4.1. Complement vs. adjunct

If we look at the part of a sentence that follows the verb, we can observe that not every constituent is subcategorized for by V (or is assigned a thematic role by V).

(49) He will meet [$_{NP}$ Sue] [$_{PP}$ at the train station] [$_{NP}$ this afternoon].
Meet: V, [__ NP]

In (49), the first NP is subcategorized for. It is a **complement** of the verb. However, the PP and the second NP are not selected by the verb. Constituents like *at the train station* and *this afternoon* that are not selected by the verb are called **adjuncts**. Adjuncts modify the event expressed by the predicate and its argument(s) and they typically provide additional information on time, place, manner, cause, or purpose. Adjuncts are always optional in a sentence, that is, deletion never leads to ungrammaticality (50a/b/c). Complements, however, may be obligatory (50d).[5]

(50) a. He will meet [$_{NP}$ Sue] [$_{PP}$ at the train station].
b. He will meet [$_{NP}$ Sue] [$_{NP}$ this afternoon].
c. He will meet [$_{NP}$ Sue].
d. *He will meet.

4.2. Subject vs. object

The distinction between subject and object is well known, but as in the case of syntactic categories (cf. section 1) we have to identify clear criteria that allow us to distinguish the two. Each finite clause contains one constituent that has the status of subject. Subjecthood within a sentence can be determined on the basis of the following four main properties:

- Position: The subject normally occurs before the verb in declarative clauses. In **questions**, it inverts with an auxiliary (51a).
- The subject determines **agreement** with the finite verb (51b).
- In finite clauses, a subject pronoun is in the **nominative** form rather than in the accusative form (51c).

[5] But note that, while it is true that adjuncts are always optional, it is not the case that complements are always obligatory. For example with a verb like *eat* the complement is optional (*Mary is eating an apple.* vs. *Mary is eating*; cf. also chapter 2, p. 41).

- In **tag questions**, the pronoun tag agrees with the subject in person, number and gender (51d –3rd person singular feminine subject, 3rd person singular feminine pronoun tag).

(51) a. [**He**] **will** go. – **Will** [**he**] go?
b. [**May**] likes/*like Joe.
c. [**She**]/***Her** is leaving.
d. [**May**] is leaving, isn't [**she**]/***he**/***it**?

Subjects are generally NPs. But occasionally PPs and entire clauses occupy the subject position. This is shown in (52):

(52) a. [**After four**] would be the best time for me.
(cf. Would [**after four**] be the best time for you?)
b. [**That May likes Joe**] surprises me.
(cf. [**That May likes Joe**] surprises/*surprise me.)

As for objects, the following properties characterize them:

- An object is a constituent that is subcategorized for by the verb. This notion is therefore similar to the notion of complement. However, the term object is often used more restrictively in order to refer to NPs only whereas any kind of category can be a complement (e.g. a PP as in 30a).
- Position: The object is generally the constituent that immediately follows the verb. In particular, adjuncts can generally not occur between a verb and an object in English (53a). In passives, the object of a verb becomes the subject (53b).
- With ditransitive verbs, a distinction is made between **direct** and **indirect** objects. The indirect object is the one that immediately follows the verb and that is represented as a PP complement in the ditransitive V-NP-PP construction. It generally refers to a goal or benefactive of the action (53c; IO = indirect object; DO = direct object).

(53) a. * He will **meet** *tomorrow* [**Sue**].
b. The police arrested [**John**]. – [**John**] was arrested.
c. Mary gave [$_{IO}$ **John**] [$_{DO}$ **a present**]. (vs. Mary gave a present to John.)

To conclude this subsection, we should point out that the notions of subject and object can also be defined structurally within the syntactic representations that we will outline in the remaining sections of this chapter. More specifically, a subject occupies what we will call the specifier of IP and the object occupies the complement position of V. We will return to this point below.

You can now do exercises 10 to 12.

5. REPRESENTING SYNTACTIC STRUCTURE: X'-THEORY

In the previous sections, we have seen that words belong to different classes, and that they combine to form units, which in turn combine to form sentences. We have also seen that the combination of units into sentences obeys certain constraints, like subcategorization by the predicate or the choice of the "right kind" (i.e. the thematic role) of subject and complement. It seems clear by now that a sentence is not just a string of words put next to each other: If words combine to form units which combine to form larger units, there must be a hierarchy in the ordering of words within a sentence. In this chapter, we will examine the different levels of hierarchy we can identify within a sentence, and how this hierarchy is organized.

In order to give a representation of a speaker's knowledge about the hierarchical organization of sentences, we will use **tree diagrams**, which give a visual, easily readable idea of the structure of sentences.

5.1. Phrases

Reconsider the following sentence discussed in section 2.2 (example 4).

(54) The old teacher will write his favourite example on the board.

The main constituents of this sentence are given in (55) between square brackets.

(55) a. [the old teacher]
b. [write his favourite example on the board]

(55a) is the subject, and (55b) is the verbal constituent. Remember that the auxiliary is not part of the verbal constituent (cf. examples 8 and 19 above, and for further discussion section 5.2 below).

5.1.1. *The verbal constituent*

We will concentrate on the verbal constituent (55b) first. The structure of this constituent is not "flat". In other words, the elements which form the constituent are themselves grouped into smaller constituents. Each constituent contains a word which is its main element. In (55b) above, the main word is the verb (V), which is the **head** of the constituent. The other words are organized in sub-groups around this head.

(56) [write [his favourite example] [on the board]]

To find out more about the structure of this constituent, let us reconsider one of the tests we introduced in section 2, the *do so* substitution test.

(57) The old teacher will write his favourite example on the board and his young assistant will **do so, too**. (*do so = write his favourite example on the board*)

(57) shows that substitution by *do so* operates on the whole constituent, that is, the verb, its complement and the adjunct. However, it is possible to reduce the size of the constituent replaced by *do so*.

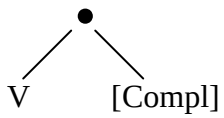
(58) The old teacher will write his favourite example on the board and his young assistant will **do so** on the overhead projector. (*do so = write his favourite example*)

In (58), the substitution operates on the verb and the complement, leaving the adjunct outside. Finally, we can go a step further and try to substitute the verb only. However, this leads to an ungrammatical result.

(59) * The old teacher will write his favourite example on the board and his young assistant will do so his favourite joke on the overhead projector. (*do so = write*)

The data in (57) to (59) show that the verb and the complement form a privileged unit which sets the adjunct apart. Given our previous discussion, this conclusion is not entirely surprising. In section 3, we already saw that the verb and its complement are in a close relation because the complement is selected by the verb. *Do so* substitution and selection thus both suggest that the verb and its complement form a syntactic unit, which, in a syntactic representation, should be marked as a separate entity. In tree diagrams, such a separate entity is represented by branches leading to a common node (60a). Whatever is below this node belongs to one syntactic unit. Alternatively, we can represent a syntactic unit in terms of brackets (60b). If we take (60) as a partial representation of (54), V corresponds to *write* and Compl to *his favourite example*.

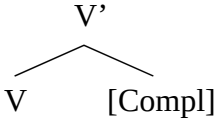
(60) a.



b. [V [Compl]]

We will say that the verb (V) and its complement form a unit labelled **V'** (V-bar). This is illustrated in terms of a tree structure in (61a) and in terms of labelled bracketing in (61b).

(61) a.

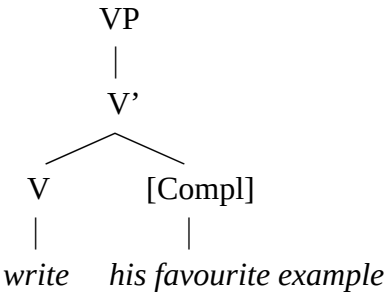


b. [$_{V'}$ V [Compl]]

In general, tree diagrams are visually clearer and therefore easier to interpret, in particular when the structures become more and more complex. We will therefore only use tree diagrams to illustrate our points from now on. In principle, however, every tree diagram could be converted into a labelled bracketing notation.

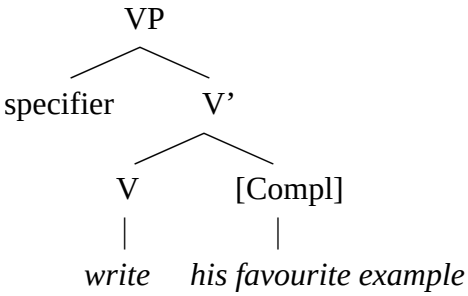
We will assume that the verb and its complement form the core of the verbal constituent. In fact, the type of representation we choose here considers the verb and its complement as forming the **verb phrase (VP**) as such. Therefore, *write his favourite example* in (54) will be assigned the following representation.

(62)



At this point, the use of both a V' level and a VP level may look redundant as we would only need one node to show that the verb and its complement form a syntactic unit. For example, it would seem possible to omit V' and to have branches from VP directly to V and to Compl. However, there are reasons to assume that we should indeed adopt the slightly richer structure in (62). This structure allows us to introduce an additional position called the **specifier** (Spec) of the VP as shown in (62').

(62')



It has been proposed that the specifier position of VP is involved in the floating quantifier construction illustrated in (63).

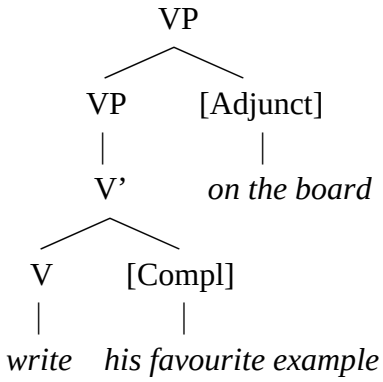
(63) a. **All** the teachers will write their favourite example on the board.
b. The teachers will **all** write their favourite example on the board.
c. The old teachers will [write their favourite example on the board], and the young teachers will **all** [do so], too.

When a quantifier like *all* is part of an NP, it precedes the determiner as shown in (63a). But *all* can also occur after the NP it modifies (63b). In this position, the quantifier is called a "floating" quantifier. The floating quantifier precedes the verb and its complements/adjuncts.

Furthermore, as the *do so* substitution test in (63c) shows, the quantifier is outside the constituent formed by the verb and its complements/adjuncts,. Floating quantifiers have therefore been analyzed as occupying the Spec position in (62'). However, in a sentence like (54), there is no floating quantifier and the specifier position remains empty. See also sections 5.1.6 and 5.2.2 (footnote 9) for some additional observations concerning the nature of the specifier position.

(62) represents the fact that *write* and *his favourite example* form a syntactic unit. However, in (57) we also identified a larger verbal constituent. This constituent includes the adjunct *on the board*. As we observed earlier, adjuncts are less directly related to the verb: They are not selected, they can be deleted, and they can easily be moved around. Given the different nature of adjuncts and complements, we would like to distinguish them in the way we represent them in the syntactic structure. This can be done by assuming that adjuncts are not part of the core verb phrase. Instead we **adjoin** them to the VP, that is we add another VP node on top of the VP node in (62). **Adjunction** to the VP is illustrated in (64).

(64)



The number of adjuncts is theoretically not limited. If there were a second adjunct, we would adjoin it by creating an additional VP node. In other words, we would have three VP nodes rather than the two in (64). If the sentence contained no adjunct at all, no additional VP levels would be required and we would simply get the structure in (62).[6]

The structural representation chosen above allows us to make a clear distinction between complements and adjuncts. The **V' level** is that of the complement. Because it is the position which is the closest to the verb, it is the one exclusively reserved for the selected complement. Adjuncts appear higher, further away from the verb, adjoined to the VP. The whole verbal constituent then includes the verb, its complement, and all the adjuncts, organized hierarchically around the verb. The "main" word of the phrase, here V, is the **head** of the phrase. We will say that VP is the **maximal projection** of the head V.

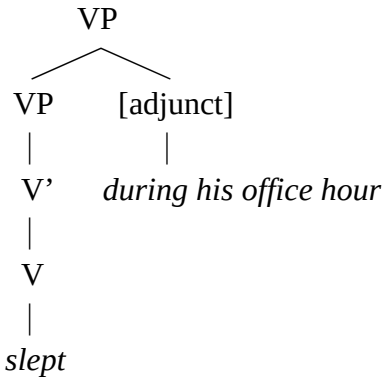
Let us now consider the case of an intransitive verb:

[6] A question that may arise at this point is whether we could not also use the process of adjunction to attach the floating quantifier shown in (63b) and we could thus avoid postulating a specifier position for this construction. In other words, it could be proposed that the floating quantifier is adjoined to the VP, but, in contrast to the adjunct in (64), to the left of the VP rather than to the right (cf. also footnote 7 below for adjunction to the left of the VP). The main reason why this proposal would be problematic is that a floating quantifier is not a simple adjunct like *on the board* in (64). Instead, as the alternation in (63) shows, the quantifier is closely related to the subject, i.e. an argument rather than an adjunct.

(65) Basil [slept during his office hour].

The verb *sleep*, being intransitive, does not select a complement. *During his office hour* is an adjunct. The structural representation will have to show that *sleep* is an intransitive verb, and that the constituent that follows it is an adjunct (i.e. not a complement). Recall that the V' position is exclusively the position of a selected complement. Therefore, (65) will have the following tree diagram representation:

(66)



In (66), the V' level, which should be occupied by the complement, is empty since there is no complement. Adjuncts appear in higher levels, adjoined to the VP, as in the case of transitive verbs.

5.1.2. *The nominal constituent*

Let us now turn to nominal constituents such as the subject in examples (54)/(55a).

(67) the old teacher

We will assume that the string in (67) can be decomposed as follows:

(68) [the [old teacher]]

That the string *old teacher* forms a unit that is independent of the determiner is suggested for example by a substitution test involving *one*: *this old teacher and that one*. Here, *one* stands for *old teacher*, which suggests that *old teacher* is a constituent. How do we represent this constituent? Again, we can observe that the constituent contains a main word. In this case, it is the noun *teacher*. This noun (**N**) will be the head of the **Noun Phrase (NP)**.

The question we must address now is whether the words which compose the NP (that is *old* and *teacher*) are hierarchically organized, as in the case of the verb phrase. If we follow the same line of reasoning, the intermediate N' position should be occupied by a complement, that is, by an element selected by the noun. Adjectives are not selected by the noun. Rather, they modify the noun, in the same way for example adverbs can modify a verb. Therefore,

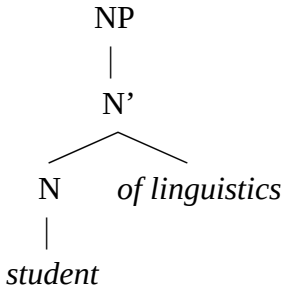
they cannot function as a complement of the noun. We expect to find them in adjunct positions.

Nouns, or at least some nouns, can take complements. The reason why this seems less obvious to us than in the case of verbs is that the selected complement of a noun is never obligatorily realized in a noun phrase. There are various diagnostics showing that nouns take complements. However, these tests are rather complex and rely on subtle judgements of grammaticality. We will not enter into a discussion of these here. Rather, we will determine the classes of nouns which can take a complement. Consider (69), where the nouns *student, demonstration* and *minister* take a complement:

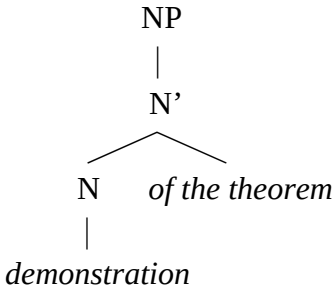
(69) a. a student of linguistics
b. the demonstration of the theorem
c. the minister of foreign affairs

The noun *student* is derived from the verb *study*. The constituent which follows it, *of linguistics*, is in the same relationship with the noun *student* as the complement, say *linguistics*, of the verb *study* in *study linguistics*. Similarly, the constituent *of the theorem* stands in the same relation with *demonstration* as the direct object *the theorem* with the verb *demonstrate*, in *demonstrate the theorem*. In fact, *student* and *demonstration* are derived from transitive verbs, and they can take a complement in the same circumstances as their equivalent transitive verbs can. These nouns are called **deverbal nouns**.

(70) a.

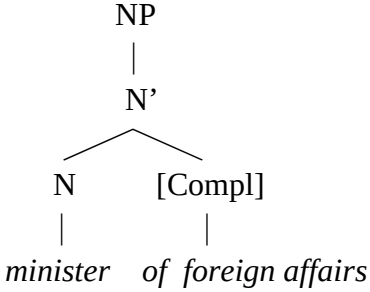


b.



(69c) is a slightly different case. *Minister* is a noun which belongs to the class of **relational nouns**. This means that it necessarily expresses a relation with something/someone. One has to be the minister of something. Similarly, *president, cousin, sister, parent, associate*, etc. are relational nouns. These nouns select, as a complement, the entity with which they entertain a relation. Therefore, *of foreign affairs* is the complement of *minister*.

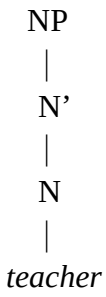
(70) c.



So nouns can take a complement, but not all nouns do, and nouns which can take complements do not necessarily express them.

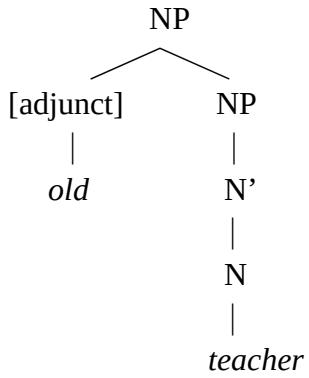
Coming back to our example in (67), we can now assign it a representation. *Teacher* is a deverbal noun (you teach something). But in our example, there is no constituent which explicitly says what the teacher teaches. So there is no complement. We will say that the NP is composed of a bare noun.

(71)



As discussed above, adjectives are not selected. Instead they modify the noun and are therefore adjuncts. Hence, we attribute the same structural position to them as to adjuncts in verb phrases: They are adjoined to the NP. Note, however, that adjectives always have to be adjoined to the left whereas most VP adjuncts are adjoined to the right.[7]

(72)



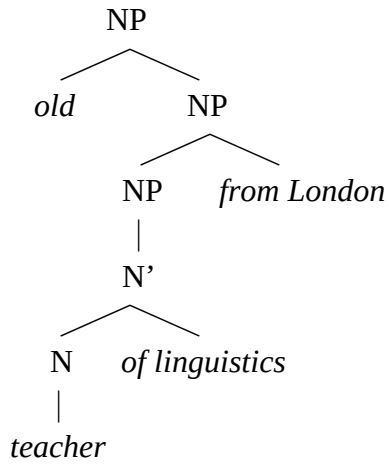
NPs can of course be more complex. For example, if we add a second adjunct, *from London*, and a complement to (67)/(68), we obtain the following nominal constituent.

(73) the [old teacher of linguistics from London]

As discussed above, *old* is an adjunct. Similarly, *from London* is an adjunct, in the sense that it does not correspond to the complement that could be selected by the verb *teach* (one does not teach London). On the other hand, *of linguistics* is a complement, since it corresponds exactly to the complement of the verb *teach* (a teacher can *teach linguistics*). So we obtain the representation in (74) for the string between brackets in (73).

[7] Cf. examples (64) and (66). There are VP adjuncts that can be left-adjoined however. An illustration would be the adverb *often* in a sentence like *John <u>often</u> eats chocolate.*

(74)



Note that the hierarchical ordering of the two adjuncts *old* and *from London* is free, none of them being *a priori* closer to the noun than the other. As for the status of the determiner in nominal constituents, we will return to this issue in section 5.2.1.

5.1.3. *The adjectival constituent*

Recall from section 2 that attributive adjectives form separate constituents (they can be deleted).

(75) a. the [old] teacher
b. the [young] assistant

The head of the constituent is the adjective (A), and it projects an **Adjective Phrase (AP).**

Again, the question arises as to whether the AP contains a hierarchical type of structure. The answer is yes. Some adjectives, when used predicatively, can select a complement.

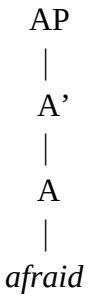
(76) a. He was [afraid].
b. He is [afraid [of tigers]].

Other adjectives taking complements are shown in (77).

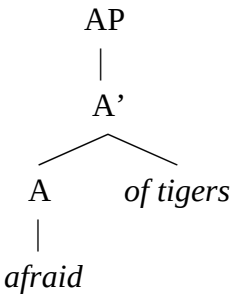
(77) a. Basil is [sick [of his cat's behaviour]].
b. She is [fond [of circus performers]].

Therefore, we can assign the same kind of representation to adjective phrases as to VPs and NPs.

(78) a.



b.



5.1.4. *The prepositional constituent*

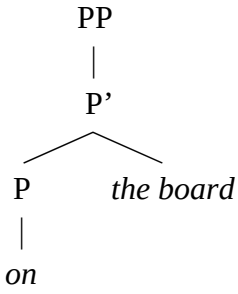
Let us now consider constituents with a preposition.

(79) The old teacher will write his favourite example [on the board].

The adjunct *on the board* is a constituent which is introduced by a preposition. Indeed, the choice of the preposition crucially determines the meaning of the constituent. *On the board* is very different from *under the board.* So the head of this constituent is the preposition and the constituent is a **Prepositional Phrase (PP)**. The preposition subcategorizes for a complement, the constituent which follows it. Usually, prepositions select a nominal complement but they can sometimes select a larger unit, that is, a whole sentence (cf. *on [the board]* versus *on [what he thought was the board]*). The representation of a PP will therefore be similar to that of the constituents discussed above:

(80) a. [on [the board]]

b.



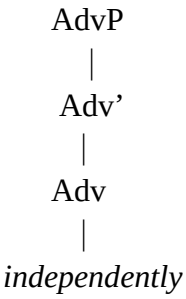
5.1.5. *Adverbial constituents*

An adverb can also be the head of a phrase, the **Adverbial Phrase (AdvP).** A small number of adverbs may select a complement.

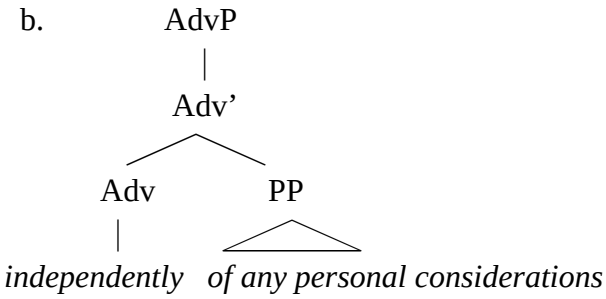
(81) a. Bob was acting [independently].
b. Bob was acting [independently [of any personal considerations]].

The representations of the AdvPs in (81a) and (81b) are given in (82).

(82) a.



b.

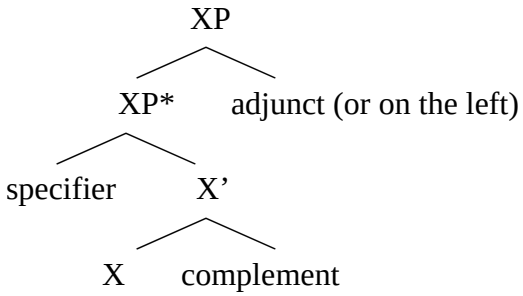


On the basis of our discussion in section 5.1.4, we can identify the complement in (81b) as a PP. The triangle indicates that the PP has internal structure (for example the NP *personal considerations*) but that it is not analyzed for the current purposes. Note that triangles must **not** be used when you are specifically asked to draw a tree diagram in an exercise (e.g. exercises 13 to 16). However, at this point we have not discussed the status of the determiner *any* in (82b), so we cannot give all the details of the structure yet. We will return to the analysis of determiners like *any* in section 5.2.1 below.

5.1.6. *X-bar*

All the constituents examined so far are organized in the same way. They include a head, which may or may not select a complement. The complement and the head form a sub-constituent, which must be distinct from the constituent as a whole, the latter including the head, the complement and all the adjuncts. We can therefore give a general representation of the following form:[8]

(83)



(83) is called the **X-bar schema** which gives the hierarchical organization of all the constituents in a language. Syntactic structure consists of (i) **a head** (X^0), which combines with the complement (if present), (ii) an **intermediate projection** (X'), which includes the head and its complement, and (iii) the **maximal projection** (XP), which "closes off" the XP and which includes a specifier and allows adjunction of one or several adjuncts. Constituents are **endocentric**, meaning that they are organized around the head. Each word is a head and therefore projects its own syntactic structure along the lines of (83).

[8] The asterisk following XP in (83) does not mean 'ungrammaticality' here but it means that this level is recursive, that is, it can occur more than once. In (83), it occurs twice, but we could also have just one XP level or a third or a fourth XP level, depending on the number of adjuncts present in a structure.

In our discussion so far, we have seen little evidence for the existence of the specifier position in (83), and the question may therefore be raised whether we really need such a position. In this brief introduction to syntax, the specifier position will indeed not play a very important role. However, there are two main reasons why we have nevertheless included it here. First, in current syntactic work, this position is consistently used for all types of constituents, including the VP, the AP or the NP. So it is considered as an integral part of the X-bar schema. To look at these uses of the specifier position would go beyond the scope of this introductory discussion of syntax, and this is something that will be explored in more advanced syntax courses (but cf. example (63) for an illustration). Secondly, as we discussed in chapter 1, linguists attempt to develop a model of a speaker's knowledge of a language. An important goal here is to identify principles and rules that are as generally valid as possible. From this point of view, the X-bar schema in (83) is very attractive in that it proposes a simple generalization concerning the nature of syntactic structure. It says that syntactic structure follows one basic pattern (the one given in (83)) regardless of whether we are dealing with a constituent that has a V as its head or an N or any other category. As we will see in section 5.2.2 below (cf. in particular footnote 9), the analysis of complete sentences crucially involves a specifier position. The minimal assumption is then that this position is more generally available. And as observed above, there are indeed reasons to assume that the specifier position is an integral part of syntactic structure. We will therefore maintain the distinction between X' and XP even though in many of our trees there are constituents whose specifier position remains empty.

You can now do exercise 13.

5.2 Functional categories

In section 5.1, we looked at the syntactic structure of phrases projected by lexical categories (V, N, Adj, Adv, P). Let us now consider the status of functional categories (I, D, C) within the syntactic structure.

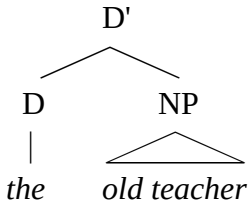
5.2.1. *The determiner*

The determiner is not part of the noun phrase as such (cf. *one* substitution, p. 189). However, its properties make an important contribution to the interpretation of the entire nominal constituent.

(84) a. the old teacher (= the teacher we know)
b. an old teacher (= we haven't introduced him yet)
c. this old teacher (= points to a given teacher)
d. his/Basil's old teacher (= indicates possession/special relation)

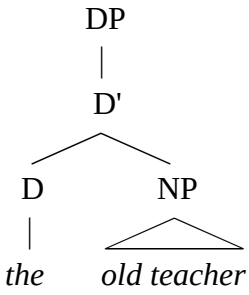
Furthermore, certain determiners cannot stand on their own but they have to be followed by an NP (e.g. **I saw the* vs. *I saw the cat*). We can therefore say that the determiner selects the noun and its projection, the NP. The NP appears thus as the complement of the determiner.

(85)



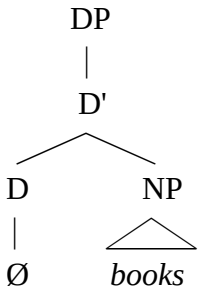
Extending the system introduced in section 5.1, we will say that D heads a constituent, the **determiner phrase (DP)**, which is organized in the same way as all other constituents.

(86)



From now on, we will always analyze full nominal constituents as DPs, NP being a subunit within the DP. This means that we also assume a DP-structure when there is no overt determiner as for example when we have a plural indefinite as in: *He bought [books]*.

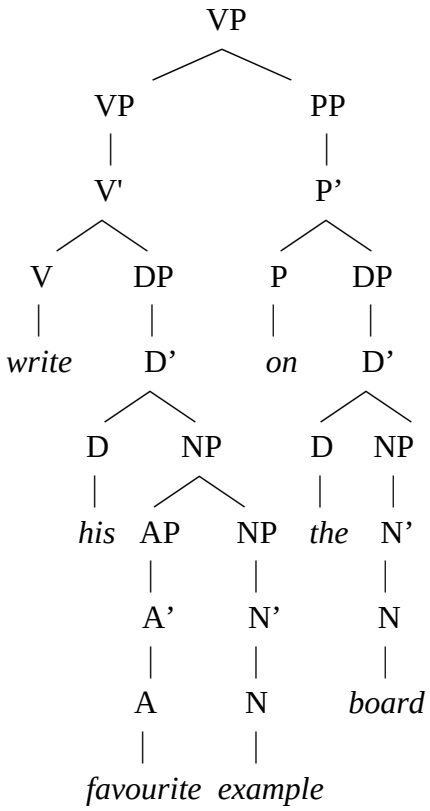
(87)



The assumption that the D position in plural indefinites is in principle available but simply happens to remain phonologically unrealized in English is supported by cross-linguistic considerations. In the French equivalent *Il a acheté [des livres]* the D position is filled by *des*. As a matter of fact, in French D is obligatorily filled in this context (cf. **Il a acheté [livres]*).

Having discussed the complete structure of nominal constituents, we can now give the representation of the whole VP in (55b) (i.e. *[write his favourite example on the board]*):

(88)



5.2.2. *The sentence*

We saw in section 5.2.1 that each constituent forms a phrase organized around a head. We will now examine the largest of the units, the sentence.

Recall that auxiliaries are not included in the VP and that they therefore must belong to a different syntactic unit (cf. section 2). In addition to the *do so* test (example (8)) and the pseudo-clefting test (example (19)), there is further evidence that auxiliaries behave in an independent way. Consider the examples below.

(89) a. Bob will eat all the yoghurts.
b. Will Bob eat all the yoghurts?
c. * Will eat Bob all the yoghurts?

(90) a. Basil should read the papers.
b. Basil should not read the papers.
c. * Basil not should read the papers.

(89) illustrates **yes-no questions,** that is, questions which require an answer of the type *yes* or *no*. Yes-no questions require that the subject and the "verb" be inverted. (89b) shows that, in fact, the element which inverts with the subject is the auxiliary. Inversion of the lexical verb along with the auxiliary leads to ungrammaticality (89c). Similarly, negation shows that the auxiliary and the lexical verb form distinct units. In a negative sentence, the negative marker

not is inserted between an auxiliary and the lexical verb and it cannot precede the auxiliary. This is illustrated with the modal auxiliary *should* in (90).

These different pieces of evidence suggest that we have to analyze auxiliaries as being distinct from lexical verbs in the syntactic structure. In addition, there is another type of element that should be treated as independent of the verb and that is the inflectional morphology on the verb. Consider the following examples with their corresponding pseudo-cleft constituency tests.

(91) a. Bob slept on the couch. – What Bob did was [sleep on the couch]
(vs. * What Bob did was [slept on the couch])
b. Bob sleeps on the couch. – What Bob does is [sleep on the couch]
(vs. * What Bob does is [sleeps on the couch])

The VPs identified in both (91a) and (91b) are *[sleep on the couch]*. The inflectional morphology expressing tense (past in (91a)) and agreement (91b) is separate from the VP.

This parallelism between auxiliaries and inflectional morphology is not entirely surprising. As shown in (92), tense information may not only be expressed by an inflectional morpheme as in (91a) but also by an auxiliary.

(92) Bob will sleep on the couch. – What Bob will do is [sleep on the couch].

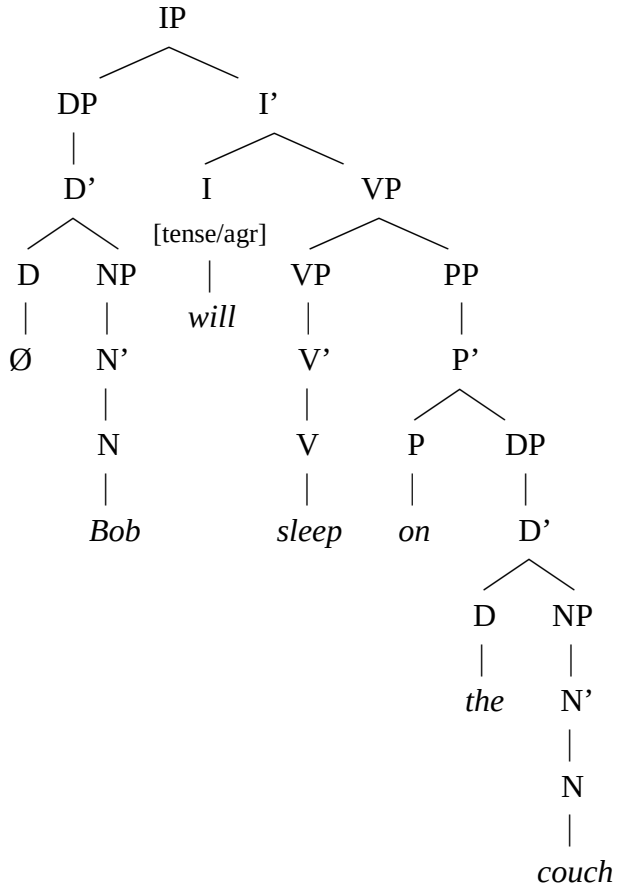
In (92), the time interpretation (future) is determined solely by the auxiliary *will*. The lexical verb itself does not have any temporal semantics. Furthermore, agreement as in (91b) can also be expressed by auxiliaries (cf. e.g. *has/have*, *am/is/are*).

The observations made above suggest that auxiliaries and inflectional morphology should be treated on a par as elements which are independent of the VP within the sentence structure. Given that they both express inflectional properties such as tense and agreement, we will label both as **I (inflection)**. Auxiliaries and inflectional morphemes require the presence of a verbal constituent. Assuming that, as any other head, I projects along the lines of the X-bar schema shown in (83), we can say that I selects the VP as its complement. But I also has a very close relation to the subject (i.e. the constituent that precedes it) in the sense that the subject determines agreement. We can capture this close relation by inserting the subject in the specifier position of the structure projected by I.[9] So **I**, which contains the auxiliary or any tense and agreement marker, is the head of a maximal projection **IP (Inflectional Phrase)**. IP

[9] Returning briefly to our discussion of specifiers in section 5.1.6, we can now observe that the analysis of sentences and more particularly of subjects within sentences requires the presence of the specifier position in the X-bar schema. The subject cannot be the complement of I since there is only one complement position and that position is already filled by VP. Furthermore, complements always occur to the right of the head in English and not to the left. But the subject cannot be an adjunct, either. Contrary to an adjunct, the subject is assigned a thematic role and it cannot simply be omitted. As a matter of fact, the subject position is obligatorily filled. Not even expletive (i.e. semantically empty) subjects can be omitted (cf. **Is raining*, **Seems that the old teacher likes Basil* based on examples (45) and (47)). These observations and the fact that subjects determine agreement (whereas neither adjuncts nor complements do) suggest that there is a third type of position in the X-bar schema in (83), i.e. the specifier position, and that the subject occupies such a position.

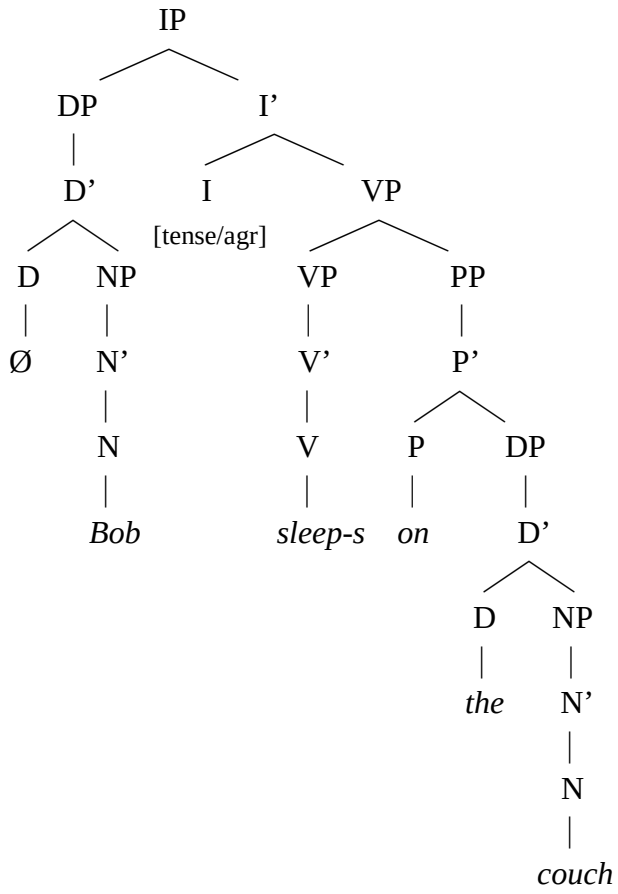
thus corresponds to the sentence and we obtain the following structure for a sentence like (92).

(93)



Given this analysis of the sentence, the question that arises now is how we deal with cases like (91) (*Bob slept on the couch, Bob sleeps on the couch*), which do not contain an auxiliary. The minimal assumption is that they have the same structure as clauses with auxiliaries. The difference is simply that we have different types of morphemes in these two cases. Whereas *will* is a free morpheme that can remain under I, past tense morphology or agreement morphology must be bound. If an auxiliary is in I, past tense or agreement can be attached to the auxiliary under I. If no auxiliary is present, the inflectional morpheme has to be attached to the verb. This process is sometimes referred to as "**affix hopping**". Thus, the idea is that the inflectional marker is related to I, but the morphology forces the marker to move to the main verb. For the moment, we will represent this by leaving the I position empty and by attaching the inflectional marker to the verb, but we will return to the analysis of affix hopping in some more detail in chapter 6, section 1.3.1. (94) shows the tree diagram for (91b).

(94)



In terms of this analysis, every sentence is an IP. The VP gives information on a certain situation, and the IP locates the situation in time due to its head's tense feature.

Now that we have determined the structure of entire sentences, we can briefly return to a point mentioned at the end of section 4.2. In section 4.2, we discussed ways in which we can define the concepts of subject and object. The tree structures developed in this section now allow us to define these notions structurally. A subject is a constituent occupying the specifier position of IP whereas an object is a constituent occupying the complement position of V. The concepts of complement and adjunct discussed in section 4.1 can also be defined structurally now. A complement is the constituent under X' in the X-bar schema, whereas an adjunct is the constituent adjoined to XP.

5.2.3. *Embedded sentences*

Sentences are formed of hierarchically organized units. Up to now, we have looked at "simple" sentences, that is, sentences which contain one predicate with its arguments, or one **clause.** In this subsection, we will discuss sentences which contain more than one clause. Consider the example below.

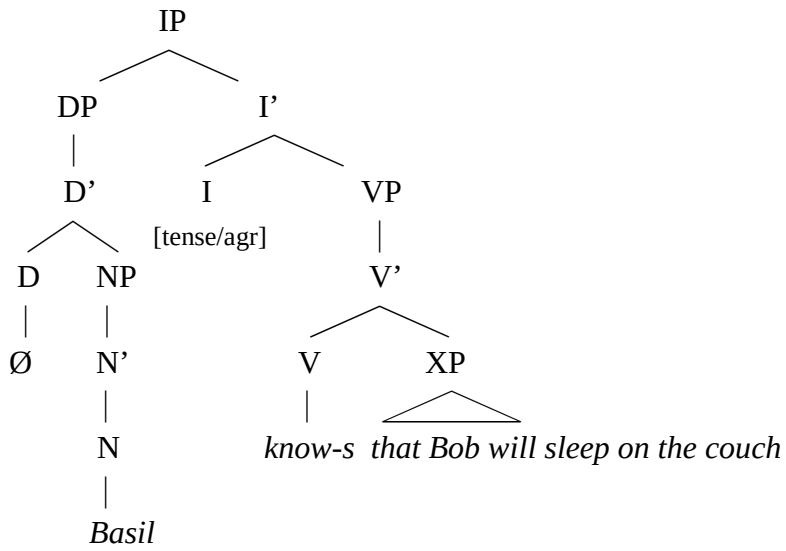
(95) Basil knows [that Bob will sleep on the couch].

The unit [*that Bob will sleep on the couch*] is a constituent. We can show this by using two constituency tests.

(96) a. Basil knows **it**. (*it = that Bob will sleep on the couch*)
b. **What** does Basil know? – That Bob will sleep on the couch.

The constituent [*that Bob will sleep on the couch*] consists of the complementizer *that* and the clause (92) discussed above. It is the complement of *know*. So it should appear in the position occupied by the complement of a verb. The partial representation is given in (97):

(97)



We will now examine what kind of constituent the XP in (97) is. This constituent is selected by the main verb. The selectional properties of different verbs may require the occurrence of different types of clausal constituents. This is shown in (98) and (99).

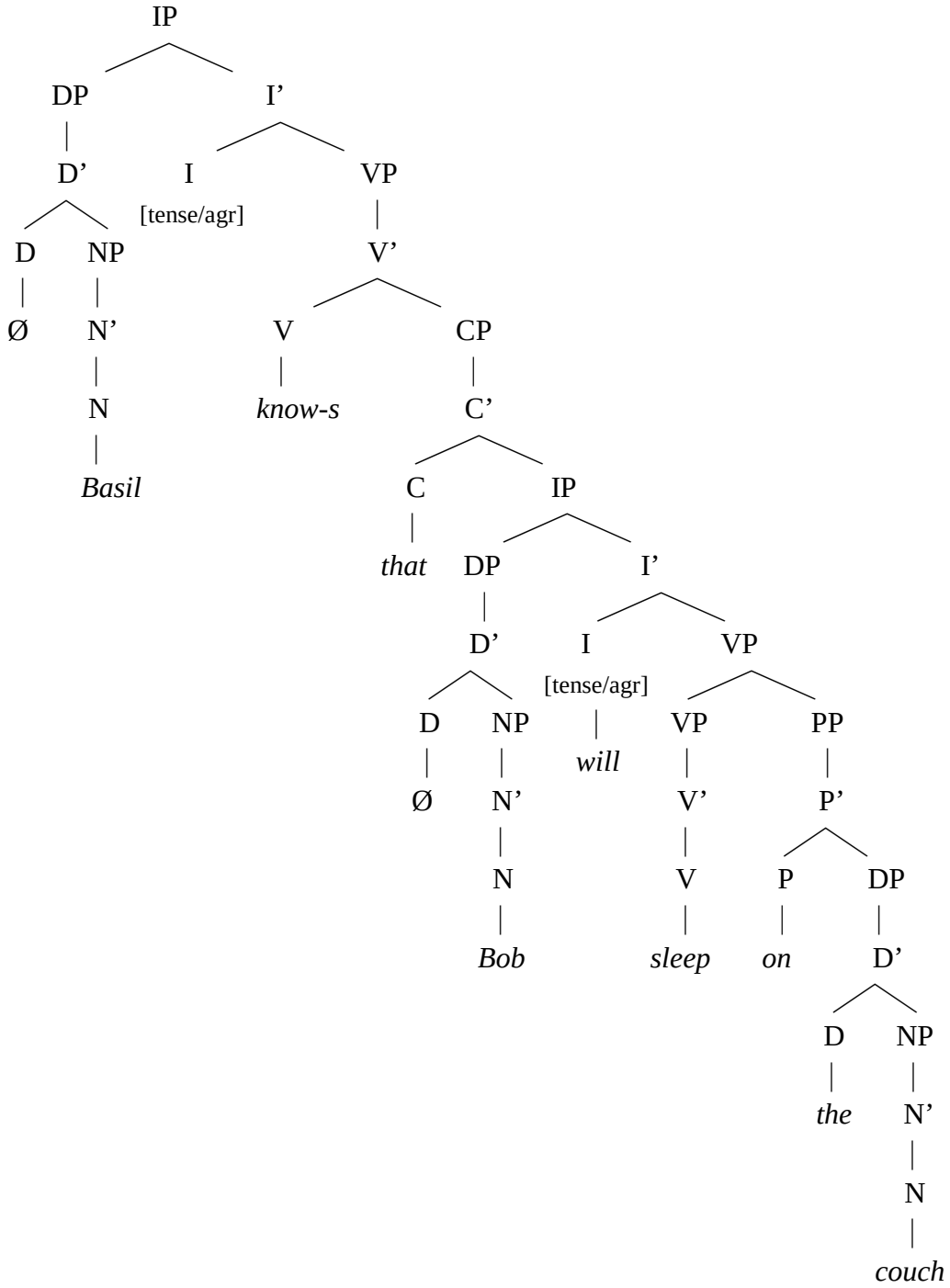
(98) a. Basil thinks [**that** Bob is sleeping in his office].
b. * Basil thinks [**if** Bob is sleeping in his office].

(99) a. Basil wonders [**if** Bob is sleeping in his office].
b. * Basil wonders [**that** Bob is sleeping in his office].

The verbs *think* and *wonder* have different selectional properties. A *that*-clause is possible after *think* but not after *wonder* whereas an *if*-clause is possible after *wonder* but not after *think*. This suggests that the nature of the selected clause is determined by the **complementizer** and that therefore the complementizer is the central element of the constituent following the verb in (98) and (99). We therefore conclude that the complementizer (**C**) is the head of the clausal constituents in brackets above. As a consequence, the entire constituent is a **Complementizer Phrase (CP)**. The string which follows the complementizer *that* is the complement of the complementizer. It is a sentence, which could in fact occur on its own. Therefore, it is analysed as an IP, and its representation

corresponds to that of sentences as discussed in the previous chapter. So the whole sentence (95) will have the following representation.

(100)



The examples discussed above show that one clause can contain another clause. We therefore distinguish two types of clauses:

(i) **Main clause** (sometimes also called matrix clause or root clause): A clause that can stand on its own, i.e. the entire sentence in (100). From the point of view of the tree structure, the main clause corresponds to the highest IP.

(ii) **Subordinate clause** (sometimes also called embedded clause or non-root clause): Any other clause. A subordinate clause can generally not stand on its own but depends on the presence of another clause. In structural terms, this means that there is a higher IP.

Subordinate clauses can occur within other subordinate clauses. This is shown in (101).

(101) Peter wonders [$_{CP}$ if Basil knows [$_{CP}$ that Bob will sleep on the couch]]].

Here, the first CP is the complement of *wonder*, and this CP itself contains another CP selected by *know*. (101) illustrates what we call **recursion**, a process that we have already come across in our discussion of compounding in morphology (p. 152). In syntax, recursion is the phenomenon whereby one instance of a certain type of constituent (e.g. CP or VP) can be embedded inside another instance of the same type of constituent. Thus, a VP can select a constituent which also contains a VP, and that VP can then again select another constituent which contains a VP etc. etc. The process of recursion thus allows the creation of an infinite number of structures and it accounts for what we observed in chapter 1 (pp. 7-8): The number of sentences that can be produced in a sentence is infinite.

To conclude this section, we should point out that there is a wide range of subordinate clauses. Above, we saw CP complements of verbs like *know* or *wonder*, the latter selecting what is called an indirect question (introduced by *if* or a question word rather than *that*). However, subordinate clauses can have many other functions or can occur in various other structural positions. Here we simply give you an overview of some subordinate clause types without going into any details as to how we could analyze them in terms of tree diagrams.

(102) a. [$_{CP}$ That he was so late] is infuriating. (subject clause)
b. John rejected [$_{DP}$ the suggestion [$_{CP}$ that the president should resign]]. (complement of N)
c. He is certain [$_{CP}$ that coffee grows in Brazil]. (complement of Adj)
d. I will buy [$_{DP}$ the book [$_{CP}$ that he recommended]]. (relative clause – adjunct)
e. Take your umbrella [$_{CP}$ because it is raining]. (adverbial clause (reason) – adjunct)
f. They left [$_{CP}$ after Rachel danced]. (adv. (time) – adjunct)
g. We won't have our picnic [$_{CP}$ if it rains]. (adv. (condition) – adjunct)

In (102), the subordinate clause contains a verbal element expressing tense and/or agreement, i.e. a finite verb form. But contrary to main clauses, subordinate clauses can also simply contain a non-finite verb (cf. pp. 168/9 and footnote 1 above for the distinction between finite and non-finite verbs). Often such clauses do not have an overt subject nor an overt complementizer. But in (103d) both a subject (*him*) and a complementizer (*for*) are present.

(103) a. [To sell now] would be a mistake. (non-finite subject clause)
b. I wonder [where to go]. (non-finite indirect question)
c. Ed enjoyed [reading this book]. (gerund – complement of V)
d. [For him to sell now] would be a mistake. (non-finite subject clause: *for* = C, *him*= subject of the subordinate clause)

Again, we will not consider the structural analysis of such clauses here but will have to leave this issue for more advanced syntax courses.

You can now do exercises 14 to 17.

CHAPTER 5 – TP EXERCISES

1. WORDS: SYNTACTIC CATEGORIES

1. Syntactic categories

Identify the syntactic category of the underlined word in the following sentences.

a. I collect antique glassware.
b. There was a large piano wedged in the doorway.
c. You must be there on time.
d. Susan probably saw her yesterday.
e. The river is very full now.
f. Give me something unusual.
g. Would you hand me that wrench?
h. Chris plays volleyball and swims.

2. Double category membership

In each of the following pairs of sentences, the underlined word in the (i) sentence belongs to a different lexical category than the underlined word in the (ii) sentence. Identify the lexical category of the underlined word in each of the sentences, using the criteria discussed in section 1 (distribution, morphology).

a. i. It was a cold and dreary day.
   ii. I can't seem to get rid of my cold.
b. i. You must dry cilantro leaves before storing.
   ii. The dry heat of the desert proved to be deadly.
c. i. There has been some improvement in the past week.
   ii. In the past, there has not been much improvement.
d. i. That's a promise.
   ii. I promise to take you to the zoo tomorrow.

3. Morphology and categories

Discuss the role of morphological properties for the determination of category membership on the basis of the following words:

a. sheep
b. lovely
c. fast

4. Meaningless words and syntactic categories

Consider the following lines from Lewis Carroll's famous poem, "The Jabberwocky":

'Twas brillig, and the slithy toves
Did gyre and gimble in the wabe;
All mimsy were the borogroves,
And the mome raths outgrabe.

a. Although the meaning is rather obscure, you are nevertheless able to determine the syntactic categories of the words. Give the categories of all the words, using the two criteria discussed in section 1 (distribution, morphology).
b. Are all the words invented? Which ones are actual words of English? Why?

5. Ambiguity

Explain how the differences in the category and meaning of the homophonous words *fly* and *like* are exploited in the following saying:

Time flies like an arrow;
Fruit flies like a banana.

Multiple class membership of words also often gives rise to ambiguities in newspaper headlines:

a. SOVIET VIRGIN LANDS SHORT OF GOAL AGAIN.
b. BRITISH LEFT WAFFLES ON FALKLAND ISLANDS.
c. REAGAN WINS ON BUDGET, BUT MORE LIES AHEAD.
d. SQUAD HELPS DOG BITE VICTIM.

Explain the ambiguities in the following headlines and compare them to those in (a) to (d).

e. 2 SISTERS REUNITED AFTER 18 YEARS IN CHECKOUT COUNTER.
f. ENRAGED COW INJURES FARMER WITH AXE.
g. KILLER SENTENCED TO DIE FOR SECOND TIME IN 10 YEARS.

6. Determiners: Cross-linguistic variation

We assume that possessives, demonstratives and articles belong to the same category, since they are in complementary distribution in English. However, other languages show a different distribution:

a. ez a ház (*Hungarian*)
this the maison
'this house'

b. la mia casa (*Italian*)
the my house
'my house'

What can you conclude about the category D in these languages?

2. SYNTACTIC STRUCTURE

7. Constituency tests

Are the underlined strings in the sentences below constituents? Use constituency tests to prove your point.

a. Mike and Peter walked through the forest cautiously.
b. She worked with great diligence on the project.
c. Tomorrow, the director will talk to all the employees they hired recently.
d. The students like fairy tales.
e. Every student knows that the teacher loves fairy tales.
f. Bart painted the dining room floor blue
g. The young hippogriff hit the boy with the black hat
h. That the students were all late made the teacher very angry.
i. Bart will paint the dining room floor blue.

3. SUBCATEGORIZATION AND THEMATIC ROLES

8. The syntactic realization of complements

a. Ditransitive verbs are supposed to select two complements. The verb *give* is a ditransitive verb, but examples such as (i) below are possible:

(i) The old teacher gave a lot of homework.

How can we account for this? (Clue: Are all complements phonologically realized?)

b. Some verbs seem to have an optional selection. This is the case for the verb *drink*. Consider the pair of examples below:

(ii) a. This cat drinks milk.
b. This cat drinks.

Should we say that there are two different lexical entries for the verb *drink?* Or can we say that sometimes the complement is not realized? Look at the semantic differences between the two examples.

9. Subcategorization frames

Give the subcategorization frames for the following verbs:

a. throw
b. love
c. eat
d. run
e. send
f. wake up

4. GRAMMATICAL FUNCTIONS

10. Subjecthood and tag questions

One of the criteria for determining subjecthood is agreement with the pronoun in a tag question. Consider the following sentences.

a. That John arrived late annoyed Bill.
b. There were three men in the park.
c. It was Mary who solved the problem.
d. The car, truck, and train collided with each other.
e. That movie, the boys really like a lot.

For each sentence, construct an appropriate tag. Then, on the basis of this tag, identify the subject of the sentence by determining which part of the sentence the pronoun in the tag agrees with.

11. Grammatical functions

Consider the following pairs of sentences.

(a) i. Mary left [this book].
    ii. Mary left [this morning].
(b) i. He waited [for an hour].
    ii. He waited [for a taxi].
(c) i. John grew [several inches] [that year].
    ii. John grew [several orchids] [that year].
(d) i. Bob saw [the old teacher with the glasses].
    ii. Bob saw [the old teacher] [with the glasses].

Determine
(a) the arguments contained in the examples above; and
(b) the grammatical functions of the bracketed constituents.
Make sure to justify your answers.

12. Arguments and grammatical functions in passives

In the text, we observed that objects become subjects in passives. Consider now ditransitive verbs. Using examples of your own, show how passivization affects sentences with ditransitive verbs. In your discussion, you should take into account both double object constructions (two NP complements) and constructions involving an NP and a PP complement.

5. REPRESENTING SYNTACTIC STRUCTURE: X'-THEORY

5.1. Phrases

13. NP structure

Deverbal nouns can select a complement but the complement is not necessarily present. Instead we can simply have an adjunct. Consider the following examples.

a. a [student in my class]
b. a [talkative student]

Give the tree diagram representation of the bracketed phrase. Then compare it to:

c. a [talkative student of linguistics in my class]

14. VP and AP structure

Give the tree diagram representation of the following constituents:

a. meet the students regularly on Monday
b. eat the strawberry yoghurt with chocolate sprinkles with a spoon
   [*N.B. A compound can be treated as a single word from a syntactic point of view*.]
c. arrive during the meeting
d. keen on strawberry yoghurt
e. fully aware of the problem

5.2. Functional categories

15. Tree diagrams

Draw tree diagrams for the following sentences:

a. The red cat eats strawberry yoghurt after dinner.
b. Poirot cleaned the knife carefully with a handkerchief.
c. Your sister called the other day.
d. Basil thinks that his teacher forgot the exams on his desk.
e. Bob knows that Basil said that cats love milk.

16. Structural ambiguity

Reconsider the example of structural ambiguity discussed in section 2.1 (example 2).

a. Bob saw the old teacher with the glasses.

Given our discussion in section 5, show how the two meanings of (a) can be represented in terms of tree diagrams. Provide two paraphrases and a tree corresponding to each of the paraphrases. Then do the same thing for the following two ambiguities:

b. He may decide on the boat.

c. She will give a talk on the moon.

17. CP

No structures have been given in the text for the complex sentences in (102). However, for some of these, the structure can be obtained fairly straightforwardly from the general proposals made in this chapter. This is the case for example for (102b). Provide a tree diagram for (102b).

Analysis of your own data – Task 5

a. On the basis of an example taken from your speech sample, explain and illustrate ONE constituency test. Your answer should consist of an explicit and coherently written paragraph (approximately 75-100 words).

b. Select a VP with a finite transitive verb from your speech sample and draw a tree for it.

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