CHAPTER II

THE STRUCTURE
AND THE INTERPRETATION
OF THE INFLection PHRASE

KEY POINTS
In this chapter you will find out about:
• the structure of the Inflection Phrase in English;
• the interpretation of the Inflection Phrase;
• the main properties of the English verbal auxiliary system;
• in what way auxiliaries differ from lexical verbs.

1. THE DATA

1.1. FREE MORPHEMES AND BOUND MORPHEMES UNDER THE SAME NODE

In the previous chapter, the idea that each sentence is a CP constituent which must contain an IP was advanced. The Inflection Phrase (IP) was defined as the core of the sentence and it was said that it is headed by \( I_0 \), an umbrella term for various functional categories of the verb, among which Tense, Aspect and Agreement, i.e. verbal morphology.

Inflection hosts morphemes which encode Tense, Agreement, Mood or Aspect information:

\[
\text{IP} \\
\text{Subject} \quad I_0 \quad \text{VP} \\
\text{(Tense)} \quad \text{(Agr)} \quad \text{(Aspect)} \quad \text{(Mood)}
\]

In (2a) below, the auxiliary \textit{will} encodes Tense (and possibly Modality, if it is interpreted as a modal) and it links the two main constituents of the phrase: the Subject NP, \textit{John}, and the predicate. In the absence of an auxiliary, Tense and Agreement are encoded by a morpheme which attaches to the lexical verb: -\textit{ed} in (2b) and -\textit{s} in (2c). These morphemes link the subject to the predicate, similarly to the way in which the auxiliary in (2a) does:
These data lead to the conclusion that the auxiliary and the Tense and Agreement morphemes occur under the node Inflection (I$^0$), the head of the IP:

As can be seen in (1) or (3), the sentence is made of three immediate constituents: the subject, the realisation of Inflection (/d/, /z/ or an auxiliary) and the predicate, i.e. the VP. The head Inflection (I$^0$) always selects a VP complement and the I$^0$ node hosts auxiliaries and morphological markers, such as Tense and/or Agreement markers. The class of elements associated with this node is a closed class, since Inflection is a functional category. In English, Inflection hosts the morphemes /z/, /d/, the English modals (can, could, may, might, must, need, ought to, shall, should, will, would) and the auxiliaries have, be, and do. This means that the node can host both free morphemes (auxiliaries) and bound morphemes, i.e. such as the past tense marker /d/ or the present third person singular marker /z/.

Not only is it assumed that two types of functional elements occur under the same node, but also that elements occurring in a different position with respect to the lexical verb at S-Structure occur under the same node in the underlying representation, at D-Structure. Tense and Agreement morphemes occur at the end of the verb in English (4a–b), whereas auxiliaries and modals occur in pre-verbal position (4c–d):

One of the properties of the English auxiliary system is that auxiliaries can occur within the same string in a fixed linear order:

1.2. Auxiliary strings
(5)  
  a. Bill must have been working for hours.  
  b. scenes that might have been devised by Proust  
  c. *Bill have must been working for hours.  
  d. *Bill must be having worked for hours.  

As can be seen in (5), the only possible order is the one in which the modal verb occupies the first position in the string. Perfective have, if present in the sentence, must always precede Progressive be1:

(6)  
Modal > (Perfective) HAVE > (Progressive) BE > lexical verb

(5a) and (5b) are grammatical, whereas (5c), where the modal is not the first one within the string of auxiliaries, and (5d), where progressive be precedes perfective have, are ungrammatical, both violating the order in (6).  

This suggests that each auxiliary is a head with respect to the auxiliary with which it merges, i.e. the complement and the form of the complement derive from the subcategorisation properties of the head. The restriction postulated in (6) could then be interpreted as the reflex ‘of the interaction of the basic ordering principle with the properties of particular types of auxiliaries’ (Schachter 1983:155).

1.3. Auxiliaries evince different properties

The fact that auxiliaries must co-occur in a fixed order indicates that they occupy different positions inside the functional domain of the verb, position that may be derivative from different syntactic properties. Not only do they differ with respect to the position in which they are allowed to occur within a string of auxiliaries, but they also impose different restrictions on the morphological form of the VP which they select as a complement:

(i) perfective have selects a past participle. (7c–d) are ungrammatical precisely because this selectional property has not been observed. In (7c) have has a short infinitive complement, and in (7d) a present participle:

(7)  
  a. He has never been there before.  
  b. They have studied syntax before.  
  c. *She has study syntax before.  
  d. *They have dancing since 8:00.

(ii) progressive be selects a present participle. Selection of a different type of complement results in ungrammaticality, as illustrated in (8c–d):

1 We leave aside the problem of the passive auxiliary be in this section. But we will analyse it in Chapter VI, in the section on passive sentences in English.
(8)
  a. They are listening to the teacher.
  b. She is talking about progressive be.
  c. *She is talked about progressive be.
  d. *They are listen to the teacher.

(iii) do and the English modal verbs select a bare infinitive. In (9c) the modal may has selected a to infinitive, and in (9d) do has selected a present participle as its complement. Both structures are ungrammatical:

(9)
  a. Do you hate syntax that much?
  b. You may change your mind if you try to understand the framework.
  c. *You may to change your mind.
  d. *Do you always skipping classes?

One can also notice that the English auxiliaries do not behave uniformly with respect to their compatibility with temporal-aspectual forms or the overt marking of subject-predicate agreement. The English modal verbs have no non-finite forms (10), i.e. they never occur in the past participle, the present participle, the gerund or the to infinitive forms:

(10)
  a. *I am canning
  b. *I have canned.
  c. *I want to can.
  d. *Canning speak English fluently, he got the job.

They cannot take tenses freely. Compare (11a), where might is inappropriate as the past tense of deontic may, to (11b), where might is appropriately used as the past tense of deontic may in indirect speech:

(11)
  a. I might leave on Monday.
  b. She said I might leave on Monday, but not sooner.

Modal verbs are never marked for person or number (agreement) (12):

(12)
  a. *He cans speak.
  b. *She musts go now.

Perfective have, progressive be and do can be used in the present tense simple and the past tense simple:

(13)
  a. They have been here for ten days.
  b. They had been here for ten days.

(14)
  a. They are listening to me.
  b. They were listening to me.
(15)  
a. Does he like chocolate?  
b. Did he like chocolate?  

They can have some non-finite forms. *Have* can occur in the infinitive, but it can never inflect for the past participle or the present participle. *Be* allows both the infinitive and the past participle, but it does not have a present progressive form.

2. THE QUESTIONS

The few empirical data presented above suggest that what we call “auxiliaries” may represent a cluster of elements which share an important number of features but which also differ from each other, in important respects. The properties briefly mentioned above also point to the fact that auxiliaries differ from lexical verbs. 

Because Inflection represents the core of the sentence, being responsible for the relationship between the other two immediate constituents of the sentence, the subject and the predicate, the properties of the elements which are the realisation(s) of this node or which occur under it are, consequently, of utmost importance for the properties of the whole sentence.

In this chapter the following questions will be addressed:

(i) how can we account for the fact that different types of functional elements (free and bound morphemes), which occur in different positions with respect to the lexical verb at S-Structure, are hosted by the same node, i.e. Inflection?
(ii) do English auxiliaries represent a distinct morpho-syntactic class?
(iii) do English auxiliaries represent a homogeneous class, i.e. do all auxiliaries (*have, be, do, the modals*) behave alike?
(iv) how can we explain the order of elements within a sequence of auxiliaries?

3. CONSTITUENCY TESTS
FOR AUXILIARIES AND BOUND MORPHEMES

3.1. Auxiliaries

The first question which will be addressed is the one in (i) above. Thus, in what follows, we will try and provide evidence that two different types of elements, free and bound morphemes, can be hosted by the same node. Moreover, both bound morphemes and auxiliaries will be argued to be sentence constituents.

At first sight, in the sentences in (16), the auxiliaries or the bound morphemes and the lexical verb are related, they seem to “go together”. They form a complex element, misleading us into believing that the auxiliary and the VP may not be independent units. Recall that the co-occurrence with Aspect, Tense or Agreement affixes represents an important property of the category verb.
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(16)

a. The teacher will be talking about constituency tests for AUX.
b. The students may not be very enthusiastic about it.
c. They have studied linguistics before.

But, as we are going to see, both auxiliaries and bound morphemes represent constituents different from the VP headed by the lexical verb. Let us look at auxiliaries first. Consider the sentences in (17) below:

(17)

a. The teacher will explain the status of AUX.
b. What the teacher will do is explain the status of AUX.
c. Explain the status of AUX is what the teacher will do.

In (17b) pseudo-clefting has applied, separating the VP explain the status of AUX from the auxiliary will. In (17c) Fronting has applied: the VP explain the status of AUX has been fronted, leaving the auxiliary will behind. These tests provide evidence that the VP and the auxiliary are two independent constituents which occupy distinct positions in the phrase marker of the sentence.

Further evidence in favour of the constituent status of auxiliaries comes from VP deletion:

(18)

a. He has published in Linguistic Inquiry but we don’t know if she has (published in Linguistic Inquiry).
b. They will go to Greece in June but she doesn’t know if she will (go to Greece in June).

In (18a) the VP published in Linguistic Inquiry has been deleted in the second clause, leaving the auxiliary has behind. In (18b), the VP go to Greece in June has been deleted, leaving will behind.

That the auxiliary and the VP do not form one single constituent is also confirmed by the do so too substitution test, illustrated in (19) below, where the whole VP (without the auxiliary) is replaced by do so:

(19)

The slim student at the back of the classroom will skip classes next week and her friend will do so too.

3.2. Bound morphemes

Pseudo-clefting, VP-Deletion and Fronting provide clear evidence that auxiliaries are sentence constituents. In spite of the intuition that bound morphemes may be “different”, the same tests lead to the same results:

(20)

a. The teacher explained the status of AUX.
b. What the teacher did was explain the status of AUX.
c. Explain the status of AUX is what the teacher did.
In (20b) and (20c) the verb (explain) and its tense inflection (Past) have been separated, providing evidence that they are different constituents. The past tense morpheme has been stranded from the verb. But bound morphemes cannot be left stranded:

(21)  
*The teacher -ed explain the status of auxiliaries.

This fact is captured by the so-called Stranded Affix Filter (Lasnik 1981):

(22)  
The Stranded Affix Filter: A morphologically realised affix must be a syntactic dependent of a morphologically realised category.

The stranded affix filter forces affixal inflection (i.e. bound morphemes) to merge with a verb. If the string contains a bound morpheme which has been left unattached, as in (21), the sentence will be ungrammatical. This merging process is a PF process which requires adjacency, i.e. no element can intervene between Inflection and the verb. If it does, Merge cannot take place.

The inflectional material on a verb is, at S-Structure, a morphological affix, but it begins its syntactic existence as an autonomous entity. In (20b) and (20c), the stranded affix which has been separated from the verb (/d/) must merge with a free element, or else the sentence will be ill-formed (it would violate the stranded affix filter). The auxiliary do is inserted to save the derivation: it provides a verbal support to which the stranded affix can attach.

The constituency tests used above provide evidence that, in spite of the S-Structure difference between bound and free morphemes, they both start as autonomous entities which finally occupy the same node, i.e. Inflection. They perform the same function: they carry tense and agreement information. Being free or bound seems to be rather a PF property, not a syntactic one.

Actually, the difference between auxiliaries and bound morphemes is even smaller than it might seem at first sight. According to some linguists, some auxiliaries, in spite of being what we call free morphemes, may actually behave more like affixes. Johnson (1988) argues that the perfective auxiliary have evinces a set of properties which distinguish it from progressive be, for example, and which qualify it as a bound morpheme rather than a free one:

(i) have may be contracted onto a preceding modal:

(23)

a. Mickey should've been eating cake.
b. Mickey should've been given a book (Johnson 1988:158).

(ii) if a VP is headed by perfective have, it cannot be elided:

(24)

*Mary must have left, and Pam must (have left) too. (Johnson 1988:158).
(iii) when perfective have is the head of the VP, VP Fronting cannot apply:

(25)
*I said Mary would have preferred chocolate, and have preferred chocolate she did.

On the basis of the empirical data in (23)–(25), Johnson reaches the conclusion that perfective have behaves like a bound morpheme, which must affix into some other head position.

The present analysis does not adopt this point of view. But Johnson's analysis is interesting because it suggests that some auxiliaries, in spite of being free morphemes, may have some "mixed" properties.

So far it has been argued that auxiliaries and the bound morphemes which occur under the node Inflection represent sentence constituents. Bound morphemes behave like auxiliaries in most respects. Not only do they encode the same type of information (Tense, Agreement), but they also have the same status: they are constituents. Evidence in favour of this view comes from pseudo-clefting, fronting, do so too substitution and VP deletion. The two classes of sentence constituents select a VP complement and can be separated from the lexical verb with which they form a complex syntactic unit.

4. EVIDENCE IN FAVOUR OF THE PHRASAL STRUCTURE OF AUXILIARIES

4.1. AUXILIARIES AND DEGREE ADVERBS

That auxiliaries are constituents which head their own projection can be seen from their co-occurrence with the so-called degree adverbs (Zagona 1988): scarcely, simply, merely, really, hardly, barely. Though superficially similar to -ly manner adverbs, they exhibit different syntactic behaviour.

Degree adverbs lack the PP paraphrase of manner adverbs:

(26)

a. John writes intelligently = in an intelligent manner.
   b. John merely writes = *in a mere manner
   c. John simply left = *in a simple manner (Zagona 1988:35)

Degree adverbs cannot appear in pre-subject position:

(27)

   b. Rapidly, John went bankrupt.

Degree adverbs never satisfy the subcategorisation of verbs like word and phrase, which must have an adverbial complement (Zagona 1988):

(28)

John carefully/*simply worded the announcement.
Their syntactic properties suggest that they are base-generated in pre-verbal position:

(29)

In sentences containing sequences of auxiliaries, degree adverbs may occur to the left of any auxiliary or modal:

(30)

This means that merely in (30) can occur in front of any of the auxiliaries in the string:

(31)

a. John merely would have been questioned by the police.
b. John would merely have been questioned by the police.
c. John would have merely been questioned by the police.

Such data prove that each auxiliary has a Specifier position available, which serves as the landing site of the moved adverbial. Evidence that there has been movement comes from ungrammatical sentences as (32) below:

(32)

*He may merely have been intelligently/carefully/gently questioned.

The ungrammaticality of (32) is due to the fact that the moved adverb has left a trace (t) behind, and hence this position cannot be occupied by a manner adverb:

(33)

He may merely have been t questioned.

In (33), the trace t, left behind by the degree adverb merely, blocks the presence of an adverb such as carefully in pre-verbal position.

4.2. Auxiliaries and all

The quantifier all has been analysed as generated in pre-verbal position. Just like degree adverbs, it can move from the Specifier of VP to the Specifier position of auxiliaries, providing evidence that auxiliaries have phrasal status:
a. The boys should have been all reading.
b. The boys should have all been reading.
c. The boys should all have been reading.
d. The boys all should have been reading.

In structures containing both a quantifier and a degree adverb, the two may move leftward, preceding the auxiliary:

(35)

a. They will have been all simply reading.
b. They will have all simply been reading.
c. They will all simply have been reading.
d. They all simply will have been reading.

The quantifier may move leftward independently, but the adverb cannot move and leave the quantifier behind:

(36)

a. They will have all been simply reading.
b. *They will have simply been all reading.

5. AUXILIARIES: IP OR VP?

So far, it has been said that auxiliaries can occur under the node \( I^0 \), that they are sentence constituents and that they head their own projection. This set of properties groups together auxiliaries such as have and be, on the one hand, and modal verbs, on the other hand:

(37)

\[
\begin{array}{c}
\text{IP} \\
\quad \text{I'} \\
\quad \quad \text{I}^0 \\
\quad \quad \quad \text{have} \\
\quad \quad \quad \quad \text{be} \\
\quad \quad \quad \quad \quad \text{modal verbs} \\
\end{array}
\]

There is, however, one important property which distinguishes between these two groups: their behaviour with respect to Tense. Whereas have and be can combine with Present or Past Tense markers and have some non-finite forms, modal verbs are more restrictive. They lack non-finite forms completely and they often carry Tense information themselves. They have been analysed as 'inherently tensed' auxiliaries. The modal can in (38a) also encodes the value "present" and so does the deontic modal will in (38b) or the epistemic modal may in (38c):

(38)

a. They can be really nagging if they want to.
b. He will buy this house, no matter what.
c. They may have decided not to attend the meeting.

The case of the auxiliary do will be addressed in the next section.
This fact led linguists to wonder whether all the auxiliaries start their existence as Inflection constituents. The answer is closely related to the problem of their status: are they main verbs or functional elements? If they behave like main verbs, one would expect them to be inserted under the VP node, i.e. in structural configurations identical to those of lexical verbs. But if they are functional categories, one would expect them to be inserted in the functional domain, under IP.

It is widely accepted that all the auxiliaries can occupy a position under IP (see 37), but they are not all base-generated in this position.

One classical analysis, which follows the line of Ross (1969), treats auxiliaries as verb-like elements and, consequently, argues that they are uniformly generated under V, from where they move to Inflection:

(39)

This idea was captured by Emonds (1970, 1976) in the definition of auxiliaries as: [+ V, + Aux] elements, i.e. as verbs which have the feature [+ AUX]. What would distinguish them from lexical verbs would then be, mainly, the [+ Aux] feature:

However, adopting these definitions implicitly assumes that auxiliaries represent a distinct class of verbs, i.e. they are verbs which also have a [+ Aux] feature. This would mean that auxiliaries form a natural class, whose main property is precisely this [+ Aux] feature.

But in many analyses auxiliaries are not analysed as a homogeneous class. The modals are often assigned a distinct categorial status. Emonds (1970, 1976), as well as Jackendoff (1972) argue that only have and be are inserted in a peripheral position under the VP, from where they can move, whereas the modals are inserted under AUX(iliary) (the “predecessor” of the node Inflection).

Along similar lines, the standard P&P analysis assumes that the English modals, which are always ‘tensed’, are IP constituents, i.e. only modals begin their existence under the node I₀ (Chomsky 1981, Lasnik 2000):

Standard P&P analysis: modals are inserted under Inflection.
Have and be are inserted under VP and reach the node \( I^0 \) as a result of movement driven by their need to merge with Tense and Agreement markers:

According to the standard analysis, then, only the modals are base-generated under Inflection, whereas have and be are generated under VP. They reach \( I^0 \) via Move.

6. AUXILIARIES VS. LEXICAL VERBS

6.1. DISTRIBUTIONAL PROPERTIES

6.1.1. Auxiliaries vs. bound morphemes

The present section is concerned with the S-Structure position which auxiliaries and bound morphemes occupy with respect to the lexical verb. In (2), both types of elements are shown to occur in pre-verbal position, under \( I^0 \). At S-Structure, the auxiliary is still in pre-verbal position but the affix has attached to the end of the verb:

\[
(42) \quad \text{a. John will leave for London.} \\
\text{b. John leaves for London tomorrow.}
\]

As already argued, affixes cannot remain stranded, being forced to merge with a verb. How does Merge take place, i.e. how does the affix attach to the lexical verb? The T-component acts on D-structure (the base structure), and the result is a "rearranged" derived structure, S-Structure. We can then assume that Move \( \alpha \) applies, allowing the affix to attach to the verb.
There are two possibilities:

(i) the verb moves (raises) to Inflection and Merge takes place in the functional domain (as shown in 43a)

or

(ii) the affix moves (lowers) to the verb and Merge takes place under VP (as shown in 43b):

(43)

a. 

\[
\begin{array}{c}
\text{IP} \\
\hline
\text{I'} \\
\hline
\text{i}^0 \\
\hline
\text{VP} \\
\hline
\text{arrive} \\
\end{array}
\]

verb raising

b. 

\[
\begin{array}{c}
\text{IP} \\
\hline
\text{I'} \\
\hline
\text{i}^0 \\
\hline
\text{VP} \\
\hline
\text{arrive} \\
\end{array}
\]

affix lowering

In order to choose between (43a) and (43b), we must look at the distribution of other sentence elements.

6.1.2. Sentence–medial adverbs

Sentence-medial adverbs of the type often, always, already, never precede the lexical verb (44a) but are preceded by an auxiliary (44b–c):

(44)

a. She always teaches syntax.

b. She will always teach syntax.

c. She has already told us about IP.

Such adverbs have been analysed as occupying an adjoining position to the lexical VP which they “quantify” (Haegeman & Guéron 1999):

(45)
The position of the inflected verb with respect to this class of adverbs can tell us whether it is the verb which moves to the affix (as in 43a) or whether it is the affix which lowers to the verb (as in 43b). If the verb moved to I°, we would expect sentence-medial adverbs to be allowed to follow the inflected verb at S-Structure:

(46)

a. * She teaches often syntax.
   b. *They drink never coffee before dinner.
   c. *John brings always flowers.

But sentences like the ones in (46), in which the sentence-medial adverb is placed after the verb, are ill-formed, which suggests that the verb cannot possibly raise to Inflection. The movement illustrated in (47) would result in ungrammatical strings:

(47)*

The only possibility is for the affix to lower into the verb; this will result into a well-formed sentence, in which the adverb adjoined to the VP precedes the inflected verb, which remains within the VP:

(48)
In (48), the affix -s lowers onto the verb, leaving the adverb often in front of the lexical verb, which results in the grammatical (49):

(49)

She often teaches syntax.

The conclusion is that in English lexical verbs do not move to Inflection to allow the affix to attach to a verb. Instead, the bound morpheme lowers to V (Emonds 1978, Pollock 1989), with which it merges.

Unlike inflected lexical verbs, auxiliaries may be followed by sentence-medial adverbs. An auxiliary like have and be can be inflected for Tense and Agreement. The fact that it occurs in pre-adverb position shows that it occurs under Inflection. Modals are inserted under Inflection from the beginning. This fact is borne out by sentences like those in (50) below, where the auxiliary verb precedes the medial adverb:

(50)

a. She may often teach syntax.
   b. They have never understood this problem.
   c. No one will ever give me a gold watch for long service.
   d. They are always arguing about this.

One of the most important differences between lexical and auxiliary verbs is, then, related to their position in the structure of the sentence: English lexical verbs remain within the lexical VP, they do not raise to Inflection, and are preceded by sentence-medial adverbs (49). Auxiliaries can occur under Inflection. The English modals, as already said, are assumed to be inherently tensed and inserted under Inflection:

(51)

The auxiliary verbs have and be are generated under VP but they can, nevertheless, occur under Inflection (with the medial adverb behind), where they merge with the tense and agreement morpheme (50b, 50d). This means that they move to Inflection, over the adverb:
The movement of these auxiliary verbs from under VP to Inflection is called \( V \to \cdot I \) movement and it observes the Head Movement Constraint, which states that a head can only move to the nearest available head position. This is also in line with Shortest Move, discussed in Chapter I.

6.1.3. Negation

Further evidence that auxiliaries are hosted by Inflection whereas lexical verbs remain within the VP comes from the domain of Negation. Consider the following sentences:

(53)

a. She has not/hasn’t taught morphology.
b. She is not/isn’t teaching morphology.
c. She will not/won’t teach morphology.
d. *She teaches not/teachn’t morphology.
e. *She not teaches morphology.

As can be seen in (53a)–(53c), auxiliaries can be directly negated by not/n’t and they precede the marker of Negation. Lexical verbs cannot be directly negated by NOT/NT: they cannot directly precede (53d) nor follow Negation (53e). The only possibility to negate a finite sentence which does not contain any auxiliary is to insert the auxiliary do:

(54)

She does not teach morphology.

This process is called Do-Insertion.

Let us see now why Do-Insertion is required in the derivation. The ungrammaticality of (53e) shows that the inflectional affix cannot lower to the lexical Verb, as in the case of the sentences containing sentence-medial adverbs. The grammaticality of sentences such as (53a), (53b) or (53c) suggests that Negation intervenes between the lexical verb and Inflection. When Inflection hosts a bound morpheme, Negation\(^3\) prevents the affix from lowering onto the verb:

\(^3\) For the time being, we do not take position with respect to the place of Negation in English. (For a detailed analysis of Negation in English, see Cornilescu 2003). This is why the phrase marker in (55) does not provide...
Remember that affixes cannot remain stranded, they need a host. Do is inserted as a last resort, providing a verbal support for the affix which would otherwise violate the Stranded Affix Filter since it cannot lower onto the verb; the adjacency condition is violated (Negation intervenes between the affix and the lexical verb):

(56)

a. John -s not like syntax.  The affix cannot attach to the verb because Negation intervenes between the lexical verb and Inflection.
b. John -s, DO not like syntax.  Do-Insertion has applied.
c. John does not like syntax.

When have and be are present in the structure, they can raise to Inflection. No do-insertion is required. One could then define do as a default auxiliary (Denison 1993).

6.1.4. Subject-Auxiliary Inversion (SAI)

One more difference between auxiliaries and lexical verbs in English is related to question formation. Let us consider the following interrogative yes/no sentences:

(57)

a. Will she teach us only generative syntax?
b. Is she teaching us about AUX?
c. Has she taught this before?
d. *Teaches she syntax?

While auxiliaries can invert with the subject (hence the label “Subject-Auxiliary Inversion”) (57a–c), lexical verbs cannot (57d). How can we explain this difference? It has been assumed that auxiliaries can occupy Inflection (being either inserted here, the case of the modals, or via Move, the case of have and be) and that lexical verbs remain under VP. What actually ‘inverts’ with the subject, moving to a higher position, is the element that occurs explicit information with respect to the position of NegP. What is relevant for the present discussion is that Negation intervenes between the lexical verb and Inflection.
under Inflection. The position to which this element moves is C (as discussed in Chapter 2, section 5.3). This movement is called I-to-C movement:

(58)

But English lexical verbs cannot move to Inflection. Consequently, what moves to C in this case is whatever material is under Inflection, i.e. the bound tense and agreement morpheme(s), an auxiliary that has raised to Inflection or a modal which was inserted under Inflection.

When the material which Inflection hosts is an affix, it will require a host. Again, do is inserted as a last resort, as a carrier of the bound morpheme (59), with the result in (60):

(59)

When the sentence contains a modal, the formation of a yes/no question is straightforward: the modal hosted by Inflection moves to C (as in 58). The fact that have and be behave like modals with respect to SAI proves that they occur under Inflection, which they reach via Move from under VP. This movement is called V-to-I-to-C movement, because the auxiliary first raises to Inflection and from there to C:

(60)
6.1.5. Tag questions and codas

Along similar lines one can explain why auxiliaries can occur in tags (62a), (63a), (64a), whereas lexical verbs cannot (62b), (63b), (64b):

(61)
- a. She will teach us syntax, won't she?
- b. *She teaches us syntax, teachedn't she?

(62)
- a. She is teaching generative syntax, isn't she?
- b. *She teaches generative syntax, teachedn't she?

(63)
- a. They can understand syntax, can't they?
- b. *They understand syntax, understandn't they?

If a sentence contains a finite lexical verb, the tag has to contain the auxiliary do:

(64)
- a. You like syntax, don't you?
- b. You don't hate it, do you?

Auxiliaries alone can appear in codas:

(65)
- a. I can explain the Principle of Projection and so can you.
- b. *I teach syntax and so teach you.

Sentence (66b), which is ungrammatical, provides evidence that lexical verbs are not allowed to occur in codas.

6.1.6. Emphatic affirmation

When a finite sentence contains no auxiliary, if the predicate is emphasised, the auxiliary do must be inserted:

(66)
- a. But my students DO like syntax.
- b. They DID tell her what to do.

This is as if, for emphasis reasons, the lexical verb and the affix must be separated and do is inserted as a verbal support of the affix. However, if the finite sentence contains an auxiliary, emphatic affirmation is possible without do-insertion:

(67)
- a. You SHALL have the money by tomorrow, it's a promise.

The behaviour of auxiliary verbs in these tests has been labelled the NICE (an acronym from Negation, Inversion, Coda and Emphasis) properties (Huddleston 1976:333).
b. "You DO shall have the money by tomorrow, it's a promise.

(68)

a. But I HAVE been there!
b. "I DO have been there!

6.2. Speculating on the main difference between lexical verbs and auxiliaries

The distributional properties discussed above are all related to the fact that lexical verbs cannot occur under Inflection whereas auxiliaries can. This difference involves one essential property of lexical verbs in English: they cannot raise to Inflection, whereas have and be can. Why can auxiliaries move to Inflection? What exactly allows them to move to Inflection but forces lexical verbs to remain in their base-generated position? Many linguists (Pollock 1989, Lasnik 1995, 2000), account for this difference in terms of impoverished/rich morphology. The idea that the movement of lexical verbs to Inflection (V-to-I movement) is restricted to languages whose morphology is rich has gained support in many studies.

Pollock (1989) proposes that languages which are morphologically rich (such as French) allow V-to-I movement. Languages with impoverished morphology do not allow their main verbs to raise to Inflection (the case of English). This is related to another important difference between lexical verbs and auxiliaries. Lexical verbs can assign roles to their arguments, whereas auxiliaries cannot (see also section 6.3.3). If Inflection is rich, it is transparent to role assignment. This means that, when a lexical verb, a role assigner, moves to rich Inflection, it will still be able to 'see' its arguments and assign roles to them. Rich Inflection is, according to Pollock, transparent to role assignment. But, when Inflection is poor, it is opaque to role assignment. If a lexical verb moves to impoverished Inflection, it will not be able to 'see' its arguments anymore and it will no longer be able to assign roles to them. This explanation raises several questions. One of them is related to role assignment, in particular to the step in the derivation when this role is discharged. Pollock’s analysis implicitly assumes that the verb has to wait until reaching Inflection to be able to assign roles to its arguments. But, if one assumes that roles are assigned when the verb merges with its argument(s), i.e. before any movement can apply, Pollock’s explanation no longer holds. A second question,

\[\text{5 One should, however, point out that not even all the auxiliaries can always raise. In imperative negative sentences be cannot raise:}\]

(i) *Be not noisy!

\[\text{Modals cannot raise in any imperative sentence (negative or affirmative):}\]

(ii) *Must leave immediately!

(iii) *Must not smoke here!

\[\text{Auxiliaries cannot raise in infinitival clauses:}\]

(iv) *I cannot believe Mary to be not nice to her children.

\[\text{6 We will use this term in the present chapter, in spite of its vagueness. More on the roles of the arguments of verbs as well as on the relationship between these roles and the syntax of verbs will be said in Chapter IV.}\]

101
equally non-trivial, is related to some modal verbs, which could be argued to assign roles (see section 9) and which can, nevertheless, move to Inflection. This would be the case of can when expressing ability or the case of volition will. Pollock’s analysis holds as long as one assumes that all the modals behave uniformly with respect to role assignment.

Morphological richness has been linked to the existence of overt person agreement (Vikner 1995) or to the existence of overt and distinctive number agreement. For example, Vikner (1995) argues that an SVO language has V-to-I movement only if person morphology is found in all tenses. Following a similar line, Rohrbacher (1993) proposes that V-to-I raising is restricted to languages which distinctively mark both 1st and 2nd person in at least one number, and the feature singular in at least one person.

In languages with rich verbal morphology, lexical verbs are inflected in the lexicon and verb inflection is assumed to be the trigger of V-to-I movement. In languages whose morphology is impoverished, such as English, the lexical verb comes bare from the lexicon and inflectional morphology is introduced post-syntactically by spell-out rules. The bare verb and the affix merge, as long as adjacency obtains (Bobaljik 1994, Lasnik 1995), in the derivation.

The English auxiliaries have and be seem to behave like verbs in rich morphology languages. Their morphological paradigm is comparatively rich. Lasnik (1995), Giorgi and Pianesi (1997:72) suggest that verb movement may vary not only cross-linguistically, but also inside one and the same language. If a verb has rich morphological endings, i.e. if it exhibits a paradigm, it will move to Inflection. This is the case of English, where have and be, just like lexical verbs in French or Romanian, have a paradigm, i.e. relatively rich morphology, and can move to Inflection. Lexical verbs, which do not have a paradigm, remain in situ.

This account is backed up by diachronical data. Before the 18th century, English lexical verbs could move to Inflection. The loss of this property is closely related to the gradual loss of morphological markers, such as the loss of agreement and of subjunctive markers (Lightfoot 1979, Roberts 1985, 1991). Such data point to a possible relationship between rich morphology and V-to-I movement.

The empirical data discussed above provide evidence that one of the core distinctions between auxiliaries and lexical verbs is related to their ability of occurring under Inflection: lexical verbs cannot move to Inflection, they remain inside the VP, where they have been inserted, whereas auxiliaries can occur under the node Inflection. This property can account for the cluster of differences between lexical verbs and auxiliaries illustrated above and which can all be related to the need/no need of DO-support:

- only auxiliaries can be negated by not/n’t;
only auxiliaries can invert with the subject in direct questions;
only auxiliaries can occur in tags and "codas";
only auxiliaries can precede medial-sentence adverbs.
emphatic affirmation is possible without do-support only in structures which contain auxiliaries.

All these data led to the conclusion that auxiliaries and lexical verbs evince different distributional properties; the two types of verbal elements fall into two syntactic classes:

VERBS

LEXICAL VERBS  AUXILIARIES

Inside the class of auxiliaries, it was shown that the modals are inherently tensed and hence inserted under Inflection, whereas have and be are inserted under VP and then move to Inflection to get Tense and Agreement markers. The auxiliary do has been shown to play a very special role: it is always inserted in the derivation when 'needed', as a Last Resort. These facts suggested that the class of elements called 'auxiliaries' is not a homogeneous class:
- modal verbs are inserted under Inflection
- have and be are inserted under VP and move to Inflection in the derivation
- do is inserted as a Last Resort.

6.3. More on the non-homogeneity of the class of auxiliaries

6.3.1. Distribution

That the English auxiliaries do not represent a homogeneous class can also be seen from some of their distributional properties. In a string of auxiliaries, the order which they can occupy is "given", as has already been said. Consider the following examples:

(69)

a. She may have discussed the status of AUX.
b. Some students may be sleeping now.

In both sentences, the modal is the first one in the string. Have and be have non-finite forms. The modal, which is always finite, i.e. it always has a tensed form, occupies the Inflection node, preventing the next auxiliary from moving to this position:

(70)
The representation in (70) illustrates the fact that the English modals, which are always associated with Tense, are base-generated under Inflection. *Have* and *be* are base-generated under a lower position, i.e. the VP node, from where they raise to Inflection (to merge with the stranded affix), provided the node is empty. If a modal already occupies this position, *have* and *be* will have to remain within their VP.

The idea that modals, on the one hand, and *have* and *be* on the other hand, do not behave in a similar way goes back to seminal studies (Chomsky 1957, Emonds 1976, Akmajian et al. 1979) where it is proposed that only modals are part of the category called AUX (auxiliary) whereas *have* and *be* are identified as a subclass of verbs. In our terms, this means that only the modals are base-generated under Inflection, whereas the other two auxiliaries start as verbs, under a VP, and then move to Inflection in the derivation.

6.3.2. Ellipsis

Perfective *have* and progressive *be* differ from the English modals with respect to VP ellipsis too. It is a fact that in English at least VP ellipsis can ignore inflectional differences between the antecedent and the elided verb (Quirk et al. 1972, Lasnik 2000):

(71)

\[
\text{John left, and Mary will too.}
\]

Sentence (71) is grammatical in spite of the fact that the inflectional properties of the elided verb differ from those of its antecedent. The antecedent is marked for past tense, whereas the elided verb is a bare infinitive:

(72)

\[
\text{John left, and Mary will (leave) too.}
\]

VP ellipsis is possible even when there are tense and aspectual differences between the antecedent verb and the elided one (Lasnik 1995). This type of identity has been called *sloppy identity*, defined as follows: It appears that a sort of SLOPPY IDENTITY is at work here, permitting tense and aspectual differences to be ignored in the same way that phi-features differences typically can be. (Lasnik 1995:22).

VP ellipsis is also possible in structures which contain the auxiliaries *have* and *be*:

(73)

a. John has left, and Mary will too.

b. John is leaving, and Mary is too.

But ellipsis seems to be more restrictive with *have* and *be*. Strict identity leads to better sentences, as can be seen below
(taken from Lasnik 1995:24), where (75b) is better precisely because identical forms of the auxiliary have been elided:

(74)  
a. John should have left, but Mary shouldn’t have left.  
b. ?John should have left, but Mary shouldn’t (have left).

(75)  
a. John has left, but Mary shouldn’t have left.  
b. *John has left, but Mary shouldn’t (have left).

(76)  
*John was being obnoxious, and Mary will too.

As (77) shows (taken from Lasnik 1995:24), the identity of form required by the auxiliary have is not merely related to PF factors, but to morphological features as well:

(77)  
*The men have left, but the women shouldn’t (have left).

In spite of the fact that the forms of the antecedent have and of the elided one are superficially identical, the present tense plural form cannot serve as an antecedent to an elided bare infinitive.

Have and be behave differently from lexical verbs with respect to VP ellipsis. We can then, following Lasnik, give the rule in (78):

(78)  
Be and have can be deleted only under strict identity of form. The bare form of a lexical verb can be deleted under sloppy identity.

Modals, on the other hand, cannot be omitted. Do, as already said, emerges in the derivation to save the affixes under Inflection, i.e. it always occupies the Inflection node when no other auxiliary is present in the sentence. It is like the “spell-out” of the abstract features of Inflection. This explains why it is in complementary distribution with all the other auxiliary verbs.

From the data presented above we can infer that the members of the class which we call auxiliaries (or auxiliary verbs) evince idiosyncratic morpho-syntactic properties which cut the class in three sub-groups: (i) have and be; (ii) modals, and (iii) do:

6.3.3. Semantic facts

It has been said that auxiliaries always select a particular type of complement, a VP complement. Have selects a past participle VP, be selects a present participle VP, modals and do a bare infinitive. Auxiliaries behave like functional categories in this respect. Another property which makes auxiliaries functional-like is that they are semantically “light” elements, they lack the kind of

Auxiliaries lack an event structure.
descriptive content which we associate with lexical verbs. Unlike lexical verbs, for example, they do not denote events, nor can they assign roles to event participants. One of the most important properties of verbs is that they denote states of affairs and that they are role assignors; information with respect to this property is provided in their lexical entry in the Lexicon. A verb like give, for example, assigns three roles: Agent, Theme, and Goal:

(79) John gave a bunch of flowers to his neighbour.

In (79), John has the role of Agent, a bunch of flowers that of Theme, and his neighbour that of Goal.

A verb like sleep assigns one single theta-role, that of Agent, and a verb like read assigns two roles: Agent and Theme. This type of information is relevant for the number of arguments a verb takes and hence for the organisation of the whole sentence. But perfective have or progressive be do not assign any role. Auxiliaries perform the function of mere carriers of Tense and/or agreement information. They take complements, but selection is purely categorial in their case. Any VP can be a complement of have or be, provided it has the right morphological form.

On the other hand, auxiliaries display properties which qualify them as verbs, the most important of which being that they cannot be inflected for Tense and Agreement. We can conclude that auxiliaries are a distinct subclass of verbs which:

- lack an event structure
- cannot assign any theta-role
- are semantically "lighter" than lexical verbs.

A closer look at the members of the class called auxiliaries will reveal an obvious non-uniformity in terms of semantic content as well. Do is devoid of any descriptive content whatsoever. It has already been suggested that it emerges in the derivation only when needed, as a Last Resort. It is a mere support for the stranded affix. The kind of information it carries is precisely the information of the "rescued" morpheme. Do has actually been defined as the auxiliary by excellence (Denison 1993). At the other extreme, the English modals, be they deontic or epistemic, have descriptive content which carries weight at the level of interpretation. They express notions such as possibility, probability or obligation. Moreover, deontic can and deontic will have been analysed as assigning adjunct theta-roles (theta-roles which they share with the lexical verb selected as their complement (Roberts 1993, Avram 1999). In (80), for example, the DP subject receives its role both from the modal can and from the lexical verb dance:

(80)
They can dance beautifully.

Various analyses of perfective *have* and progressive *be* argue that they are not completely semantically vacuous (see, for example, Guéron 1986, Lasnik 1995, Avram 1999) as previously assumed. Some of these studies propose unifying analyses of the lexical verb and its auxiliary counterpart, adopting the point of view that there is one single item *have* and one single item *be* in the Lexicon.

These facts have two important consequences: (i) they show that auxiliaries, though occurring under functional nodes and displaying properties which distinguish them from lexical verbs, are also different from functional categories, and (ii) auxiliaries do not represent a homogeneous class in terms of semantic properties either. The only set of properties which they all share and which clearly distinguishes this class from lexical verbs is that of the so-called NICE properties.

7. EXPLAINING AUXILIARY ORDER

One of the properties of the English auxiliary system which must be accounted for is the order in which auxiliary verbs may co-occur:

(81)

a. Bill must have been working for hours.
b. She may have been weeping.

Within a string there may be only one auxiliary belonging to each "type": one modal, one perfective *have* and one progressive *be*. The order is always the same. The leftmost element in a finite clause is finite and it can be separated from the rest of the string by the subject in questions (82) or by the Negation constituent in negative sentences (83):

(82) Could she have been working for hours?

(83) He may not have been sleeping.

The data suggest that the leftmost auxiliary, which carries tense and agreement features, is the one occurring under Inflection. Also, the fact that *have* and *be* may occur only in one single order, i.e. perfective *have* < progressive *be* shows that they are associated with different positions in the syntactic structure.

How can we account for this rigid order? It has been said before that auxiliaries are verbal elements which select a VP as their complement and that there are certain restrictions with respect to the morphological form of this V: modals always select a bare infinitive VP, *have* a past participle and *be* a present participle. These restrictions point to a certain dependency between the auxiliary and the affix which merges with the lexical verb, dependency which could be translated into the compositional structure and interpretation of any verbal string containing an auxiliary: the auxiliary and the affix attached to the main verb contribute to the temporal-aspectual information of the sentence. The lexical verb itself contributes its descriptive content, i.e. its event structure and its role-assigning property, whereas the
auxiliary contributes the grammatical, abstract information: tense and agreement. The form of the VP is required by the selectional properties of the auxiliary, properties which determine the ordering within a sequence of auxiliaries. Akmajian, Steele and Wasow (1979) put forth the hypothesis that the position which auxiliaries can occupy in a sentence is determined by the type of complement they take. They propose a “stacked” representation for the auxiliary configuration (see also Emonds 1976):

(84)

This stacked representation can capture several important facts: that do and the modals differ from have and be: they occupy the node AUX. This can explain why a modal is always the leftmost element in a verbal string. It also captures the fact that have and be do not occur under the same node. What it cannot explain, however, is why be cannot precede have.

One simple explanation would be the one relying on the morphological properties of auxiliaries. Remember that perfective have cannot occur in the past participle or the present participle. This will explain why it can never occur as the complement of progressive be.

Schachter (1983) provides an interesting account of the same data, trying to explain, at the same time, why the sequence perfective have-perfective have, or the sequence progressive be-progressive be are not possible either. The main assumption is that the sequence Perfective have – Progressive be is the reflex of the semantic properties of the perfective and the progressive auxiliaries. Have as a perfective auxiliary has been analysed as a marker of perfectivity, of completeness. The action or the state denoted by a perfective verbal structure is seen as instantiated before an indicated point in time:

(85)

John has left.

The event of John’s leaving is presented as fully instantiated before the time when the sentence is uttered.

The core meaning associated with a progressive verbal structure is that of incompleteness. This makes have, a marker of prior instantiation, incompatible with the progressive, a marker of incompleteness. The perfective auxiliary cannot occur in the progressive. This should not be surprising, there are many lexical verbs (some achievements, states) which are incompatible with the progressive. However, the difference between the auxiliary have and those lexical verbs which resist the progressive is that with have recategorization is not possible, i.e. it can never co-occur with the progressive:

(86)
* Whenever I see you, you’re always just having returned from a vacation. (Schachter 1983: 61)

The progressive be – progressive be sequence is impossible, according to Schachter (1983), because be, which is a state verb, is incompatible with the progressive (unless recategorized). Since the auxiliary be preserves the meaning of its lexical counterpart, that of “be located”, it is incompatible with the meaning of an on-going incomplete action/state.

The perfective have – perfective have sequence can be accounted for along similar lines. The auxiliary have signals that the event/state of affairs denoted by the main verb is in the past relative to the time of the utterance. A second perfective have would mark its complement as in the past relative to some moment which is being placed in the past relative to the present moment.

8. THE TEMPORAL INTERPRETATION OF THE INFLECTION PHRASE

So far we have only analysed those elements which are hosted by Tense and Agreement inside the functional domain of a sentence. Nothing has been said about the elements which are hosted by AspP or MoodP. You will remember from Chapter 1 that IP is an umbrella term for Tense, Agreement, Aspect and Modality. So far, we have only mentioned which elements instantiate Tense and Agreement in English. In this subsection we will analyse the elements hosted by AspP, with a focus on the way in which they enter into relationship with the elements hosted by TP. This analysis will allow us to address the question of the temporal interpretation of root clauses. In particular, we will try to see in what way their semantics can be read off their syntactic configuration.

AspP is the functional projection closest to the VP which is associated with aspectual features and which can host elements that encode such features: -ing, -en. The -ing morpheme is associated with [+ perfectivity] whereas -en is associated with [- perfectivity]:

(87)

They are both affixes and, in accordance with the Stranded Affix Filter, they need a PF host. They adjoin to the lexical verb. We will not consider here in detail how they adjoin to V. Given our previous discussion about lexical verbs and auxiliaries, which led to the conclusion that English lexical verbs do not move to Inflection, one would expect the Aspect morphemes to lower and adjoin to the Verb. We will not adopt this position, though, for at least two reasons. Firstly, there is no syntactic evidence that the lexical verb cannot move to Asp, of the type invoked when
discussing the movement of the verb to Tense and/or Agreement. Secondly, aspect is inherent to any verb. Verbs denote events and events must have some internal structure. They may lack Tense or Agreement, but they cannot lack Aspect. The lexical verb moves to Asp, via head-to-head movement, to check its inherent aspectual feature(s): 

On such an analysis, a syntactic object like eaten is the result of a movement operation: eat moves out of the VP to Asp, where it merges with the morpheme –en. Similarly, eating is analysed as the result of the movement of eat to Asp, where it has merged with the aspect morpheme –ing.

The analysis of the properties of auxiliaries in English pointed out two facts which are directly relevant for the present discussion: (i) have and be move to Tense and Agreement and (ii) the verb which they select as a complement is required to have a particular morphological form: have requires a past participle and be a present participle. This amounts to saying that they select an AspP as their complement and that this AspP is required to have certain properties. The auxiliary and the AspP complement together form a complex temporal-aspectual form. At the level of syntactic representation, this form has its tense information in TP and the aspectual information in AspP. The temporal interpretation of the whole clause derives from the way in which the two types of information combine.

We assume that TP and AspP represent two links along the same chain: the Tense-chain. Notice that this is not a derivational chain. It is a strictly representational chain which we invoke when analysing the mapping of syntactic structure onto interpretation. The two links are co-indexed by virtue of identifying the same event. Such an analysis has at its core the assumption that tense and aspect cannot be treated separately because they both deal with the temporal structure of situations and their functions are complementary: tense places the event in time, taking an external viewpoint, while aspect presents the internal structure of the event, taking an internal viewpoint. The temporal-aspectual system comprises both tense and aspect. Let us see how they “share” the event identification task.

\[ \text{(88)} \]

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9 See also Johnson (1991) where it is argued that in English verbs can move out of VP to positions which contain morphology, among which he mentions the affix that forms participles (in complex tenses) or the infinitive.

10 The auxiliary be which occurs in passive sentences is analysed in Chapter VI, section 3.
The temporal analysis of a sentence derives from the way in which Speech Time (ST), Reference Time (RT) and Event Time (ET) relate to each other (Reichenbach 1947). Johnson (1981) proposes that the temporal interpretation of a sentence is calculated in terms of the values of the relationship which obtains between these points: (i) ST/RT; (ii) RT/ET; (iii) ET/ST. It is important to see that the third relation, the one between ET and ST is not a direct one: it is mediated by the relation which obtains between RT and ET.

The relation between ST and RT provides the tense value:
(i) RT prior to ST: past tense value
(89) In the last half-hour of 1979, several of her acquaintances attempted to prophesy for the next decade.
(ii) ST prior to RT: future tense value
(90) They will study semantics next year.
(iii) RT simultaneous with ST: present tense value
(91) Herds of people are milling around these intersections, waiting for the lights to change.

The relation which obtains between ET and RT is responsible for the aspectual value:
(i) ET prior to RT: perfective
(92) a. They have reached an understanding with respect to bills.
b. She has never known what he thinks of Liz.
(ii) ET including RT: imperfective
(93) a. None of us, thought Jane, is wearing a dress made in France.
b. Esther was standing stranded on the black and white marble tiles.

And finally, the relation between ET and ST is responsible for what Johnson calls Existential status:
(i) ET prior to ST: historical status
(94) He had had a succession of god hands and won the kitty twice.
(ii) ST prior to ET: non-historical status
(95) Her nephew is getting married next month.
(iii) ST = ET: semi-historical status
(96) They are considering going there themselves.
Let us see how these work in the analysis of a particular sentence:

(97)  
*John had talked to Mary before the party.*

ST = now  
RT prior to ST (-ed): past tense value  
ET prior to RT (*before the party, had*): perfective value  
ET prior to ST: the situation has the status of a historical event.

Where does this interpretation come from? Let us go back to the functional projections inside IP and see what elements they host. TP is associated with tense markers (-ed) which indicate the relationship between RT and ST. AspP is associated with aspectual markers which indicate the relationship between ET and RT (perfective/imperfective viewpoint). The existential status is given by the whole chain, as a composite of the information provided by the two links TP and AspP:

(98)

What is still missing in the representation above is the link which anchors the whole chain to ST. This link has been referred to in the literature as the T-Operator (Guéron & Hoekstra 1988) and, since it anchors the sentence to the discourse, it is assumed to occur inside the complementiser layer of the clause. ST is always now. The existential status of the event which the sentence refers to is evaluated taking this now as a point of departure. A Tense chain, then, consists of a Tense operator (T-Op) in the complementiser layer, the head of the Tense projection (TP) in the functional domain, and the head of the Aspect projection (AspP). Each link in the functional layer can host specific morphological markers which encode information relevant for the temporal interpretation of the whole clause:

(99)

---

11 Tense and aspect are related both notionally and formally.

11 You will remember from Chapter II that the CP layer links the clause to the discourse.
Aspect and tense are related both notionally and formally\textsuperscript{12} and hence they cannot be treated separately (Johnson 1981, Smith 1991, Stowell 1994, Avram 1996). The temporal interpretation of sentences provides further evidence that the interpretation of the sentence is always compositional, i.e. determined by the elements it is made of and the relations between them. Also, the fact that temporal interpretation presupposes a T-Operator hosted by the complementiser layer provides further evidence that every clause is a CP.

9. THE ENGLISH MODALS: A SPECIAL CLASS

9.1. The questions

So far, the standard P&P analysis of the English modals has been presented, i.e. that the modals are all inserted under the node Inflection. In what follows we will examine other lines of investigation, with a view to answering the following questions:

(i) are all modals base-generated in the same position in the structure?
(ii) does their interpretation vary according to the position which they occupy?
(iii) do all the members of the class of modals evince the same properties and hence have the same status?

9.2. Main lines of investigation

9.2.1. General remarks

The syntax of the English modals has received much attention in generative grammar, mainly because of their morpho-syntactic properties which clearly set them apart from lexical verbs. The most striking characteristics of the English modals are the so-called NICE properties (Huddleston 1976), which were already discussed with respect to auxiliaries in general in section 6.1. These properties will be illustrated again in what follows, this time with a focus only on modals:

(i) Negation can attach to the modal, without DO-support:

\textbf{(100)}

\begin{itemize}
  \item[a.] I cannot come.
  \item[b.] "I do not can come.
\end{itemize}

Subject-Modal inversion is possible in interrogative sentences and in tags; do cannot be inserted:

\textbf{(101)}

\begin{itemize}
  \item[a.] Must they leave?
\end{itemize}

\textsuperscript{12} "The interpretation of tense is a complex affair; particular tense forms can be construed in quite different ways, as determined by a complex interaction of factors, including verbal aspectual class (stative vs. eventive), grammatical aspect (progressive vs. punctual), verbal epistemological class (intensional vs. extensional), clause type (complement clause vs. relative clause, finite clause vs. infinitive), and scope relations with other tenses" (Stowell 1994:1).
b. “Do they must leave?”

(102)
a. You can speak English, can’t you?
b. You can speak English, *don’t you?

(iii) Modals can appear in “codas”:

(103)
a. I can come and so can Bill.
b. *I can come and so does Bill.

(iv) Emphatic affirmation is possible, again without DO-support:

(104)
a. You shall have the money by tomorrow.
b. *You do shall have the money by tomorrow.

Such properties clearly distinguish the English modals from lexical verbs and show that they behave like the auxiliaries have, be and do.

We could call this set the "No do-support" set of properties because (i)–(iv) can be reduced to one single fact: unlike lexical verbs, modals do not need "do-support". As seen in (101b), (102b), (103b), (104b) and (105b) they are incompatible with the auxiliary do. The English modals and do seem to be in complementary distribution.

The English modals also evince other properties which qualify them as a syntactically and morphologically definable class. These properties distinguish them both from lexical verbs, as well as from the auxiliaries have and be:

(v) they are incompatible with non-finite forms:

(105)
a. *They are canning to do it now.
b. *To can or not to can, that is the question.
c. *They have must(ed) do it for a long time.

(vi) they are incompatible with agreement:

(106)
*He mays do it.

(vii) they always select a short infinitive as their complement:

(107)
They must (*to) leave immediately.

(viii) they have no passive form
(ix) they have no imperative
(x) they cannot co-occur, with the exception of certain dialects:

(108)
a. You might would say that.
b. I don’t feel as if I should ought to leave. (Southern USA, from Denison 1993)
(xi) some modals have two tense forms (present and past) (109), some have a past tense form which can only be used in reported speech (110), while others have only one form (which can be used in past contexts as well but under certain conditions) (111):

(109)  
  a. They can play the piano.  
  b. They could play the piano when they were young.

(110)  
  a. She may leave immediately.  
  b. The boss said she might leave immediately.

(111)  
  a. They must leave immediately.  
  b. The boss said they must leave immediately.

(xii) a modal is always the first verb in a finite verbal group, i.e. it cannot be selected by any other auxiliary.

(112)  
  a. They may have been punished for what they had done.  
  b. We might have gone about half a mile, and my pocket-handkerchief was quite wet through, when the carrier stopped short.

The properties listed above provide evidence that the English modals have a “non-lexical” status, behaving in certain respects like functional categories. On the other hand, their content is very much like the semantic content of any lexical category. Assuming that modals have been the subject of grammaticalization, it seems obvious that the development of the English modals from lexical verbs into a functional class has not implied semantic bleaching, as is customary with the processes whereby a lexical element develops over time into a grammatical element. That might explain their exceptional behaviour. One can distinguish two main directions in the analysis of the English modals:

(i) the modals as lexical verbs analysis  
(ii) the modals as auxiliary/ a distinct syntactic class analysis.

9.2.2. The modals as lexical verbs analysis

9.2.2.1. Intransitive vs. transitive configurations

This line of investigation goes back to Ross (1969), Newmeyer (1969), Perlmutter (1970), Huddleston (1978), to name just a few. The main assumption is that modals are main verbs which can occur in both intransitive and transitive structures.

With Ross (1969), intransitive configurations are associated with epistemic readings (as in 113) while transitive configurations are associated with deontic readings (as in 114):

(113)  
  a. They may have been punished for what they had done.  
  b. We might have gone about half a mile, and my pocket-handkerchief was quite wet through, when the carrier stopped short.
Palmer (1979), pointing out the difficulties of such an analysis (among others the problem of the I in 114) argues that sometimes modals belonging to the same semantic class can enter either a transitive or an intransitive configuration. Deontic can, for example, is to be analysed as intransitive when it means possible for..., as in (115), but as transitive when its meaning is that of ability (defined as expressing "subject oriented" modality), as in (116):

\[(115)\]

The lexical verb analysis: deontic modals are control verbs/the epistemic modals are raising verbs.

\[9.2.2.2. Control vs. raising structures\]

In more recent studies, deontic modals are analysed as generated in VP-adjunct position and are associated with control structures (117), i.e. the subject of the modal controls the empty subject PRO of the lexical verb which it selects as a complement. Epistemic modals are analysed as generated under Inflection and associated with raising structures (118), i.e. structures in which the subject of the lexical verb raises to the subject position of the matrix:

\[116\]

^13 S = Sentence (in the Standard model of generative grammar, Chomsky 1965) and it would roughly correspond to the IP within the P&P model.
(117)
She can play the piano.
She can [PRO, play the piano].

(118)
a. They may have arrived.
b. They may have arrived.
c. They may [e, have arrived]

In (117) the subject of the matrix, she, 'controls' the empty subject, PRO\textsuperscript{14}, of the embedded clause, i.e., they have the same referent. In (118) the subject of the embedded clause, they, has raised out of the embedded clause to the subject position of the matrix, leaving behind a trace.

Such an analysis builds on the fact that in deontic readings the subject receives a theta-role (actually an "adjunct theta-role") from the modal verb, whereas in epistemic readings the subject receives a theta-role exclusively from the lexical VP selected as a complement. Epistemic modals are compatible with perfect infinitive (119) or progressive complements (120), and they do not impose any selectional restrictions on the subject, because the subject is assigned a theta-role by the lexical verb in the complement, not by the modal.

(119)
We could easily have succeeded.

(120)
It was not possible that such a tiny creature could be showing such strength.

Deontic modals can only take a bare infinitive complement:

(121)
a. The family could hear her swift heavy steps up there.
b. I need say nothing here [...] because nothing can show better than my history whether that prediction was verified or falsified by the results.

They may impose certain selectional restrictions on the subject. For example, they cannot take expletive elements or idiom chunks as their subject.

One main problem with this line of investigation is the fact that there are cases of deontic modals which can have a perfect infinitive complement (122) or cases which are ambiguous between a deontic and an epistemic reading (123):

(122)
Candidates must have filled in an application form.

(123)
She could have run faster.

\textsuperscript{14} PRO denotes an empty (non-overt) NP, which is the subject of non-finite clauses (infinitival clauses, gerundial clauses, participial clauses). It is in complementary distribution with overt NPs, being excluded from those contexts in which it can receive Case. PRO must be ungoverned. It has a mixed nature: +anaphor, + pronominal, because its interpretation can be either controlled by an antecedent (like anaphors) or arbitrary, when it has no antecedent (like pronouns). See also Chapter III and Chapter VII, section 3.
Modals which are treated as deontic within such an approach do not always evince the same properties. Compare (124) and (125) (where 125 is ambiguous between permission and ability readings):

(124)
They may leave as soon as the bus arrives.

(125)
They can speak Chinese.

The subject in (124) is assigned a theta-role by the verb in the complement (leave) rather than by may. The structure does not seem to be a control structure at all. In (125) (when the reading is that of ability) the subject is assigned a theta-role by the complex "modal + lexical verb". When the reading is that of permission, the subject receives a theta-role from the lexical verb selected as a complement. The two sentences also differ in terms of modality: (125), when can is interpreted as meaning 'ability', it simply describes a state of affairs, a property, it is a description of the world as it is (there is almost no modality involved), whereas (124) or (125), when can means 'permission', try to change the world, to cause a certain change in the present state of affairs.

Also, analysing the modals as control/raising verbs cannot account for their morho-syntactic behaviour which clearly sets them apart from other lexical verbs which may enter the same type of configuration (control or raising).

9.2.3. The modals as a distinct class/auxiliaries analysis

This line of investigation goes back to Chomsky (1957), where the English modals are treated as being, structurally, outside the VP constituent, under the node AUX(iliary), i.e. they are defined as a syntactically distinct class. Within such an approach, modals are analysed either as occupying a position under the AUX constituent, together with perfective have and progressive be (Chomsky 1957, Jackendoff 1977\textsuperscript{15}) or as distinct from these two auxiliaries. Emonds (1976) and Akmajian et al. (1979) argue in favour of a distinct category AUX, but only the English modals are assigned to this distinct category, while have and be are identified as members of a subclass of verbs. AUX labels "a constituent that includes elements expressing the notional categories of Tense and/or Modality" (Akmajian et al. 1979:2). It is important to understand that placing the modals under the category AUX is different from the discussion whether there is a category of auxiliaries distinct from the category of verbs. As Reuland (1983: 104) points out:

As far as this issue is concerned it could very well be the case that all traditional auxiliaries are actually main verbs, and yet in the optimal grammar one must assume a position outside the VP (an S-daughter), which at the surface is always occupied by a verb, with properties different from those of the ordinary V-position within the VP.

\textsuperscript{15} In Jackendoff (1977) the modals are argued to fall together with HAVE and BE, and they are assigned the following lexical feature analysis: [+ Subj, + Obj, – Comp], where [– Comp] is interpreted as the only feature which differentiates them from main verbs.
Within a P&P model, as already discussed in this chapter, the modals are argued to be generated under the node Inflection while *have* and *be* are generated inside the VP constituent. In Chomsky (1981) it is tentatively asserted (in a note) that "perhaps the Modals also appear within INFL" (p. 140). The modals are thus once again seen as occupying a structural position shared by Tense as well. But the "Aux-V" structure is regarded as a verbal complex.

Some studies are more radical in asserting that the English modals are generated under Inflection. Van Kemenade (1993) clearly asserts that modal verbs are not V in any sense, defining the present-day English modals as base-generated under Inflection. The most important difference between modal and lexical verbs is that the former do not select what she calls a propositional element (VP/IP/CP): "Thus, the modals are exceptional in that, though verbal, they have no selectional properties, which I take to reflect that they cannot assign a theta-role" (van Kemenade 1993:144). This property is also considered as essential in Roberts (1993) and Ouhalla (1991): the modals cannot assign theta-roles, and a verb which is not a theta-role assigner will have a radically different distribution.

On such an analysis, the English modals can only appear in Inflection. Ouhalla (1991) argues that the modals represent a distinct syntactic category heading its own maximal projection (ModP) as in (127), between Tense (TP) and Negation (NegP):

(126)

\[ \begin{array}{c}
\text{Spec} \\
\text{Agr} \\
\text{T} \\
\text{T'} \\
\text{Mod} \\
\text{Mod'} \\
\text{Neg} \\
\text{Neg'} \\
\text{VP}
\end{array} \]

This analysis, he claims, can account for the fact that (some) modals can move to Tense and that they can precede Negation. Within such an approach all the modals are defined as functional elements, which occur under a functional projection of the VP, inside a split IP.

One problem with such a "unifying" analysis is that it cannot account for the fact that there are modals which do not move to Tense. Fiengo (apud Palmer 1979), for example, explores the possibility that epistemic modals are tenseless elements, whe-

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16 There is a clear continuity from AUX to Inflection.
root modals are tensed elements. Treating all the modals as occupying the Mod position cannot capture the intuition that can in (127) and can in (128) might behave differently with respect to Tense:

(127) David can make delicious cookies.

(128) David can't have made such delicious cookies.

Nor can this analysis capture the intuition that deontic modals, or at least ability can and volition will, behave differently with respect to theta-role assignment. Roberts (1993) assumes that at least ability can and volition will can assign an (adjunct) theta-role. Root readings are associated with richer thematic structure than epistemic readings.

One more problem (already discussed when pointing out the problems the lexical verb approach raises) is caused by the fact that elements usually analysed as deontic do not always evince the same set of properties (semantic or syntactic). Ability can does not express modality imposed by the speaker, it simply describes a state of affairs, a property of the subject of the sentence. It has a past tense equivalent, which means that it can raise to Tense.

(129) She raided the fridge when no one could see her.

Obligation must or permission can, on the other hand, clearly express the speaker’s (direct/indirect) wish of making the world fit his/her words; they do not describe a situation but try to create one.

(130) a. You must leave immediately.
    b. You can leave when you feel like.

Under most analyses, ability can, permission can and obligation must are analysed as expressing deontic modality. The data in (128)–(131) prove that the meaning of the modal, be it deontic or epistemic, can play no part in its syntactic behaviour. Moreover, it has often been pointed out that the English modals are ambiguous between a deontic and an epistemic reading, but that there is a systematic relationship between the two in the sense that the deontic readings, which are basic, are metaphorically mapped onto the epistemic domain (Sweetser 1989, 1993). Also, Hoey (1997), though assigning each modal a set of major meanings, points out that "the various senses described are not necessarily discrete and meanings may overlap" (p. 23).

9.2.4. A small clause analysis

9.2.4.1. The hypothesis

In what follows, we will present evidence in favour of the hypothesis that the English modals have one single entry in the lexicon (see Avram 1999). They are verbal elements which lack an event structure and merge in the derivation with a small clause (SC). The resulting structure is monoclausal. The complexity of the SC will force the modal to occupy different positions in the
structure of the clause. This analysis adopts the view that the modals have a core, unitary meaning and that we are faced with an "extension" of meaning, from root to epistemic. But the extension is analysed in structural terms. The different contextual readings of the English modals are assumed to result from the different positions which they occupy in the structure.

On this analysis, there are three positions which the English modals can occupy:

(i) under VP:

(ii) in a Mood projection under Tense (Mood1P) (the position which Ouhalla 1991 proposes for all the English modals and which he calls Mod):

(iii) under a node Mood2, higher than Tense, which would roughly correspond to the one proposed by Rivero (1994) for the languages of the Balkans (Albanian, Bulgarian, Modern Greek and Romanian):

9.2.4.2. Modals under VP

The lowest position occupied by the English modals is under VP as shown in (131). This is the position which a modal like can occupies when occurring in a context like the one provided in (134) or will when used in a context like the one in (135):
John can dance.

(135)
I will drown and no one shall save me!

Such sentences are interpreted as denoting one single event across the modal and its complement:

(136)

\[
\begin{array}{c}
\text{Spec} \\
\text{VP} \\
\text{V'} \\
\text{V^0} \\
\text{VP}
\end{array}
\]

\begin{align*}
\text{can} & \quad \text{dance} \\
\text{will} & \quad \text{drown}
\end{align*}

Sentences which contain such a structure resist passivization. (Jenkins 1972). Compare (138) and (139) below:

(137)
The doctor can examine John.

(138)
John can be examined by the doctor.

The meaning of the two sentences is different as shown by their paraphrase, which clearly points to the fact that (138) is not the passive counterpart of (137):

(138')
The doctor is able to examine John.

(139)
It is possible for John to be examined by the doctor.

Ability can (in138) shares the argument structure of the lexical verb dance; they share the direct object John and the subject the doctor. In the passive sentence the modal can does not share the argument structure of the lexical verb. The promoted NP is an argument of the lexical verb only. Hence the two different interpretations.

Unlike the English lexical verbs, but similarly to the auxiliaries have and be, can in (135) or will in (136) can move to Inflection overtly. One possible explanation would be that some deontic modals have retained, in present-day English, the verb-like properties they had in Old English and in Middle English, when they could move to Inflection, i.e. they have not changed as much as generally assumed in the literature. The modals which merge with a bare infinitive VP are [+ V] elements. They behave more like what Roberts (1993) calls "lexical auxiliaries". Their [+ modal] feature seems to be very weak. Actually, ability can and volitional will have been analysed in the literature as the last of the English modals to be "reanalysed" as members of a distinct new class. There are researchers who deny their modal content. Steele (1975) or Boyd and Thorne (1969) regard can as a modal only when it conveys permission, denying the modal content of ability can. It is worth mentioning that deontic can even retained non-finite forms in various English and Scottish dialects.
A few remarks on the bare infinitive selected as a complement by *can / will* are in order here. From a syntactic point of view, bare infinitives have often been analysed as "incomplete" structures, i.e. as structures which lack functional projections. From the point of view of their interpretation, bare infinitives differ from *to*-infinitival complements. Fisher (apud van Kemenade 1993) argues that there is a clear-cut distinction between (i) a configuration with a verb that has merged with a bare infinitive complement and (ii) a configuration with a verb that has merged with a *to*-infinitive complement.

The configuration in (ii) reflects two events that do not occur simultaneously$^{17}$ whereas the one in (i) reflects either one event or two simultaneous events. In (140) below the infinitival clause (a *to*-infinitive) and the verb in the matrix denote two non-simultaneous events. The *to*-infinitive denotes something "unrealised" with respect to the matrix (Stowell 1982), its temporal meaning being dependent on the meaning of the verb in the matrix.

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$^{17}$ Stowell (1982) argues that *to*-infinitival clauses take tense. Thus, one important difference between *to*-infinitives and bare infinitival constructions would be that the former have Tense whether the latter lack a Tense projection.
They hope to meet her soon.

In (141) the modal is followed by a short infinitive. The modal and the lexical verb denote one single event. The modal lacks an event structure of its own; thus, the only possible reading is that of "one event" across the modal and the lexical verb. The lexical verb shares the event structure with the modal:

(141)
They can speak Japanese fluently.

When can and will merge with a bare infinitive, as illustrated in (132), they will occur under VP and they will preserve most of their verb-like properties:

(142)
can [ bare infinitive/VP ]
will [ bare infinitive/VP]

Such an analysis can explain the way in which such complex VPs interact with Negation. Consider simple utterances like (143)–(146):

(143)
I cannot dance with you.

(144)
Can you NOT shout at everybody?

(145)
He can't NOT shout at everybody.

In (143) Negation has attached to the modal, which has raised to the functional domain of the sentence and negates the whole sentence. In (144) NOT has local scope, it only negates the bare infinitive, not the modal, and hence the sentence as a whole is an affirmative sentence. In (145) both the modal and the bare infinitive are negated but the sentence is, in spite of the apparent double negation, grammatical. The negation is not double, the event structure is negated only once (when negation attaches to the tensed modal). NOT negates only the bare infinitive, i.e. the VP, not the whole sentence. It behaves like a negative adverb (Cardinaletti and Guasti 1995):

(146)
The negative adverb has local scope, it does not render the whole sentence negative as the following relevant test shows:

(147)

a. You can NOT shout, can't you?
   b. *You can NOT shout, can you?

(148)

a. Can you NOT shout at anyone anymore?
   b. *Can you NOT shout at someone?

The examples in (147) prove that NOT does not render the whole sentence negative whereas the examples in (148) show that NOT has scope over the whole bare infinitive.18

However, this analysis raises one problem. If can and will are defined as verbal elements which can raise to the Tense projection, we would expect them to be able to take temporal-aspectual forms freely. But they are incompatible with any form which involves the auxiliaries have and be, as we have already seen. This incompatibility can be related to the fact that the English modals are defective verbs which lack a present/past participle form. This is an idiosyncratic property stated in the lexicon. Since have and be functionally select these particular forms of the verb, they cannot take modals as their complement.

9.2.4.3. Modals hosted by a projection below Tense

Recall that Ouhalla (1991) proposes that all the English modals occur under a functional node which he calls Mod. According to our analysis, this is the position which can host a modal in the functional layer of the clause: Mood1, as shown in (133), repeated for convenience in (149):

(149)

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18Zanuttini (1996) also argues in favour of treating the English negative marker "not" as an adverb which occurs in an adjoined position, behaving, in many respects, like the negative marker "nen" in Piedmontese. The idea of treating "not" as an adverb has been advanced before. Johnson (1988) also distinguishes between two types of "not":

(a) a contrastive one, which bears focal stress and which may precede any VP, SCs included: Mikey made Garry NOT drink the martini (Johnson 1988:164)

(b) a non-contrastive NOT, which does not receive focal stress and which can only precede a verb in Inflection. The not in the VP complex under analysis would be of the contrastive sort.
The contexts in which the modals are associated with this functional projection are provided below:

(150) 
You may leave now.

(151) 
You must take the exam in December.

(152) 
They shall be rewarded.

Though at first sight it might seem there is no difference between the configurations containing modals discussed in 9.2.4.1, there are arguments which prove that the configurations illustrated in (150)–(152) have different properties. One important difference is related to the temporal interpretation of the SC with which the modal has merged. This time, the modal and the lexical verb no longer denote one single event; the modal is anchored at Speech Time (ST), and it is ‘present’, i.e. Reference Time and Speech Time are the same (RT = ST). The SC with which the modal merges denotes a situation that has not obtained yet, i.e. Reference Time is prior to Event Time. Since the relation between ET and RT is responsible for the aspectual value of the sentence (Johnson 1981), Avram (1999) puts forth the hypothesis that in this case the SC with which the modal merges is no longer a bare infinitive, a VP, but an Aspect Phrase (AspP):

(153) 
modal verb [AspP]

This will force the modal to occur under a higher projection, MoodP (as in 139). The modal is also “heavier” in terms of modality: it no longer describes a situation as it is, but it ‘imposes’ a change in the present state of affairs. Importantly, MoodP is still lower than Tense, allowing the modal base-generated in this position to raise to Tense, which can account for sentences such as (154), where the modal has a past Tense form:

(154) 
I could stay up late on Saturdays when I was a child.

Another important difference is related to the argument-sharing properties of the complex VP. That these properties are different can be seen from the behaviour of this ‘verbal complex’ with respect to passivization. Consider the following sentences:

(155) 
You can speak English in this office.

(156) 
English can be spoken in this office.

(156) is a possible passive counterpart of (155) precisely because the modal and the lexical verb do not share the arguments. The modal cannot assign any theta-role in this configuration, not even an adjunct theta-role.
9.2.4.3. Modals hosted by a projection higher than Tense

The English modals can also occupy a position above IP, in the Mood2P:

\[ \text{Mood2P} \quad \text{Spec} \quad \text{Mood2'} \quad \text{Mood2} \quad \text{T/AgrsP} \]

In this case, the modal merges with a more complex SC and it will be pushed to a higher projection in the structure. Crucially, this time the modal is inserted higher than Tense, which can nicely account for the fact that these modals are actually incompatible with Tense. Consider the following sentences:

(158)
They may have met her.

(159)
He must be working in his room.

(160)
She can't have been hiding this all along.

In each of these sentences the modal is used in its epistemic sense\(^{19}\) and it is 'present', marking the speaker's evaluation/judgment/etc. of the situation denoted by the SC with which the modal merges. The evaluation and the act of speaking are simultaneous (Palmer 1979:41) and, consequently, the temporal value of the modal can only be present. The situation which the modal evaluates, though, can be going on at ST, i.e. present (as in 159), or prior to ST, i.e. past (as in 158), or it can be a situation which began prior to ST and is still going on at ST (as in 160). Obviously, the situation can also be a future one:

(161)
They may be leaving tomorrow.

The temporal independence of the SC is taken as evidence that the SC has the status of a TP:

(162)
modal verb + TP

When occurring in such a configuration, the modal is incompatible with tense, being part of the discourse in a way similar to modal adverbials such as possibly, probably, certainly, maybe, etc.

\(^{19}\) However, this should not be taken as evidence that only epistemic modals are allowed in this position. Consider the following sentence: The applicants must have filled in the forms. In this sentence, the modal merges with a TP complement and it has a deontic reading.
The analysis presented in this section defines the English modals as verbal elements whose precise status and interpretation depend on the derivational history of the structure of the clause in which they occur. It is assumed that a modal can occupy a position in the lexical domain when it merges with a VP, a position in the functional domain when it merges with an AspP, and a position at the borderline between the "complementiser layer" (Rizzi 1995) and the functional one, when it merges with an IP. The modal is always the same; what changes is the degree of complexity of the SC with which it merges in the derivation. It is precisely this degree of complexity which forces the modal to occupy a certain position in the structure: the more complex the SC, the higher in the structure the position of the modal will be.

Such an analysis, according to which modals can occupy three different positions, also builds on the fact that the verbal nature of the modal, its [+ V] feature, is subject to change. While the modal occupying the position under VP has (some) properties of a lexical verb, the modal under Mood2 behaves more like an adverb. It is a common assumption in the literature that the English (epistemic) modals do not contribute to the thematic information of any configuration. Just like adverbs, they are dependent on the element which they "modify" (i.e. they can be described as having a modifying function over propositions or events) but the modified element itself is only "structurally" dependent on the modal. The present analysis provides a syntactic counterpart to those semantic analyses which treat epistemic meanings as extended root (deontic) meanings.

One more advantage of the analysis is that it can explain why modals cannot co-occur. Modality is interpreted along a Mood-chain\(^{22}\) which has a link at the borderline between the Complementiser layer and the functional layer, one in the functional layer and one in the lexical domain:

\[
\text{(163)}
\]

\[
\begin{array}{c}
\text{MoodP2} \\
\text{MoodP1} \\
\text{VP (lexical domain)}
\end{array}
\]

Along the chain, Mood can be overtly marked only once. For example, if a modal occurs in Mood2, this will disallow the Mood1 position to be filled as well:

\[
\text{(164)}
\]

* He may must leave soon.

In (164) may occurs in Mood2. So, the Mood chain already has one overt element filling one of its links. Must would have to occur in Mood1, but this is prevented by the fact that one link is already filled with overt material.

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\(^{20}\) This analysis builds, on the one hand, on the view that there is a clear, close relationship between epistemic and deontic meanings (Sweetser 1993) and, on the other hand, on the view that a linguistic expression is best described as a derivation, where derivation is seen as a step-by-step building of structures, by recursive operations (Chomsky 1995).

\(^{21}\) Jackendoff (1977) describes adverbs as evincing the features in (i) and modals as evincing the features in (ii):

(i) [+ N, + V] [+ Comp]
(ii) [+ N, + V] [− Comp]

It seems that it is only the nominal feature which differentiates between the two classes.

\(^{22}\) For arguments that Mood is interpreted along Mood-chains see Avram (1999).
This chapter focussed on the structure and properties of the English Inflection Phrase. It was shown that this projection can host both free and bound morphemes which are syntactic constituents.

Auxiliaries in English have been defined as a distinct subclass of verbs which are sentence constituents and have phrasal status. The members of this class share a set of semantic and morphosyntactic properties which distinguish them from lexical verbs:

- they do not have an event structure
- they do not assign theta-roles
- they always select a VP complement
- only auxiliaries can be negated by not/n’t
- only auxiliaries can invert with the subject in questions
- only auxiliaries can occur in tags and codas
- only auxiliaries can precede medial-sentence adverbs
- emphatic affirmation is possible without do support only in structures which contain auxiliaries

- only auxiliaries can occur under Inflection:
  (i) the modals (some modals) are inserted under Inflection
  (ii) have and be raise to Inflection from the VP where they are inserted.

It was argued that the most important property which distinguishes between lexical verbs and auxiliaries is related to their ability of occurring under Inflection: only auxiliaries have this property. This is due to their different morphological properties. Lexical verbs are bare in the lexicon and the affix merges with them later in the derivation. Auxiliaries are inflected in the lexicon and they raise to Inflection to “check” their morphological features.

*Have* and *be* were shown to differ from the English modals with respect to:

- morphological properties
- base-position (modals are generated under Inflection, *have* and *be* under VP and reach Inflection via movement)
- morphological form of VP complement
- VP deletion
- descriptive content

*Do* was defined as a Last Resort element, as a ‘default’ auxiliary.

The data led to the conclusion that the class of auxiliaries is not, actually, a homogeneous one.

It was suggested that the fixed order of auxiliaries in English (modal — perfective *have* — progressive *be*) is due to their selectional properties and to their semantic (mainly aspectual) properties.

The last part of the chapter briefly presented three possible approaches to the English modals:

- the modals as lexical verbs;
- the modals as a distinct class of verbal elements inserted under Inflection;
- the modals as verbal elements which can occupy three different positions in the structure of the clause: one in the lexical domain (under VP), one in the functional domain (under a Mood Phrase) and one at the borderline between the functional and the complementiser layers (under a Mood2P).

It was claimed that the small clause analysis can account for the data better than the other two analyses.
Exercises

(1) Illustrate two constituency tests for auxiliaries and the bound morphemes which are hosted by Inflection.

(2) What is the importance of the “stranded affix filter” for the structure of sentences? Relate this constraint to the phenomenon called DO Insertion.

(3) Illustrate five properties which distinguish auxiliaries from lexical verbs and then try and define auxiliaries.

(4) How can we account for the contrasts in the following sentences:
   (a) Jane has not been eating well lately./Jane eats not well.
   (b) Bill often sends silly letters to Jane./Bill sends often silly letters to Jane.
   (c) Jane does not have to write Ph.D. thesis./Jane has not to write a thesis.
   (d) The teacher did not have the students write a review./The teacher had not the students write a review.
   (e) Jane hasn’t a new car. (formal British English)/Jane does not have a new car. (American English).

(5) On the basis of their distributional properties discuss the status (lexical or auxiliary verb) of the boldfaced verbs in the following examples (Haegeman & Guéron 1999: 164):
   (A) a. I have to do this. (b) Do I have to do this? (c) I always have to do this. (d) I don’t have to do this.
   (B) I had my students write an essay on verbs. (b) I didn’t have my students write an essay on verbs.
   (c) Did you have your students write an essay on verbs? (d) I always have my students write an essay on verbs.

(6) What is the status of have in the sentences below: lexical verb or auxiliary? (Haegeman & Guéron 1999: 164):
   (a) We always have a great time. (b) I never have a bath in the morning. (c) I always have too much work to do.
   (d) A circle hasn’t any corners (formal British English).

(7) Decide whether get in the following sentences can be treated as an auxiliary:
   (a) John got arrested for theft when he was young.
   (b) John often got arrested for theft when he was young.
   (c) Did John get arrested for theft when he was young?
   (d) John didn’t get arrested for theft. (Haegeman & Guéron 1999:165)

(8) On the basis of the distributional properties you listed in (3) show that MAY in “John MAY be sleeping” is an auxiliary.
(9) Compare the properties of perfective have and progressive be to those of modal auxiliaries. What properties do they share and what properties distinguish between the two subclasses of auxiliaries?

(10) Consider the following sentences (from Radford 1992: 153). What properties of DO can you list on the basis of these sentences? Compare its properties to those of the auxiliaries have and be and to those of modal auxiliaries. What conclusions can you draw with respect to DO?

(a) Do you like spaghetti? (b) You like spaghetti, don’t you? (c) I do not/don’t like spaghetti. (d) I really do like/*liking/*liked to eat spaghetti. (e) *I want you to really do make an effort to eat your spaghetti. (f) *I want you really doing make an effort to eat your spaghetti.

(11) How can we account for the fact that DO can only be used when the sentence contains no other auxiliary? Explain what we mean when we say that DO is used as a Last Resort.

(12) Use the do so test to reveal the structure of the VP in the following sentences. Which constituents may be either included in or left out of the VP replaced by do so? What does this tell us about the status of auxiliaries?

(a) John will go to Paris on Tuesday. (b) Mrs O. will leave after lunch. (c) Mrs O. will leave. (d) John will be kissing Mary in a few hours. (e) John will speak about syntax.

(13) Explain the ungrammaticality of the sentences below:

(a) *Scarcely, John eats fruit. (b) *Simply, I like syntax. (c) *Barely, he could stand. (d) Merely, they were discussing the weather. (e) *They have merely been all gossiping over a cup of coffee. (f) *We will be simply all dancing in the park. (g) *John teaches always syntax. (h) *They smoke never when their father is at home. (i) *She gets angry often.

(14) Translate the following sentences into English placing the degree adverbs and all in as many positions as possible:

(a) O fi fost pur şi simplu întrebat ce caută acolo. (b) De-abia se putea ține pe picioare. Oricum, băuse destul de mult. (c) De-abia dacă îmi pot aminti ce s-a întâmplat. (d) Poate că încerca pur şi simplu să fie politicos. (e) Poate că pur şi simplu ascultau toţi muzică în clăsă. (f) Textul aproape că nu fusese modificat de sute de ani.

(15) Translate the following sentences into English, placing the auxiliaries in the right position:
(a) Se poate să fi lucrat acolo de dimineață fiindcă la prînz, cînd am ajuns eu, erau cu toții frînti de oboseală. Cu greu i-am putut recunoaște pe Ion și pe Vasile, care erau plini de noroi pe față. Probabil că lucraseră în partea dinspre rîu, unde era mai noroios terenul. (b) Nu se poate să fi așteptat de la 9 fiindcă eu personal trecusem pe acolo pe la 9 și nu era nimeni în fața ghîșei. Se prea poate să fi venit cîndva după 9 și jumătate, după ce am plecat eu. (c) Se gîndi că poate podul se construia de aîta amar de vreme numai din cauza ploii; plouase mult în ultimele luni, fapt care probabil ținea lucrările în loc.

(16)
Explain what we mean when we say that the temporal interpretation of a clause is compositional. Provide examples.

(17)
Identify the modals in the sentences below:

a. He could not remember, because he had never witnessed the event, his elegant parents being hoisted, slightly puzzled, on to farm carts, but behaving with grace.

b. She checked every radio she could find.

c. What could be better, for this purpose, than a street in New York […] where the subject of extravagant, impulsive disorders can enjoy and exhibit to the full the monstrous liberty, or slavery, of their condition.

d. What could have happened with Mrs O’C.?

e. This may even teach us something about the cerebral basis of certain visions and dreams, and of how the brain may weave a magic carpet to transport us.

f. Thus, from his earliest days, he remembered scenes that might have been devised by Proust. […]

g. She was not on any medications which might unbalance her excellent mind.

h. But it is not enough to be told. You must see for yourself.

i. You must see a neurologist, my colleague, dr. Sacks.

j. I must still be dreaming, she thought. But this was not so.

k. Should we say, rather, that she was caricaturing everyone?

l. Why should she suddenly develop this strange symptom?

(i) Discuss in what way the complexity of the small clause with which they merge determines the way in which we interpret the contextual value of the modal as well as the position which it occupies in the structure.
(ii) Draw a tree for each configuration.

(iii) Can you detect any regularity with respect to the type of modality involved (epistemic/deontic) and the position in which the modal occurs?

Identify the modals in the text. State whether they are used in their epistemic or deontic meaning. Discuss their temporal value as well as the temporal value of the small clause with which they have merged.

'You might have been dead', I went angrily on. 'I can't think what you can have been doing. The oven was on at number nine. Oh, Christ, I suppose it must have been Flora. Was she playing in the kitchen while I was giving Joseph his bottle?'

'Yes, yes, she was, she must have done it', said Pascal [...].

'You must be an idiot, I said, 'what if I'd stayed out all night, you'd probably all had been dead by morning. I bet you feel bloody awful, with all that whisky on top of all that gas. I'd better go and look at the children'.

'Oh, they will be OK', she said, lying back on her pillow, with a pale and guiltless smile.

[...] I went to bed feeling, as one might imagine, indispensable. [...] Had it not happened to me, I could not have believed that two tolerably responsible adults could behave with such lunacy. (Margaret Drabble, The Garrick Year).