Minimalist Syntax Revisited
Andrew Radford, 6 December 2006

This is a substantially revised version of my book Minimalist Syntax: Exploring the Structure of English (published by Cambridge University Press in 2004). One form of revision is the omission of chapter 2 of Minimalist Syntax (with some of the relevant material incorporated into chapter 1 of this coursebook), in order to make the book shorter, and make it more likely that you will get to the end of it! The second form of revision is that much of the material in Minimalist Syntax has been revised and updated (in particular some of the analyses have been changed and some new material has been added in chapters 5-9). This coursebook is available only in electronic form, and should be referred to in the following format:


The book has two main aims. The first is to provide an introduction to recent work in syntactic theory (more particularly to how the syntactic component operates within the model of grammar assumed in recent work within the framework of Chomsky’s Minimalist Program). The second is to provide a description of a range of phenomena in English syntax, making use of minimalist concepts and assumptions as far as possible – while avoiding excessive technical complexity. It is intended to be suitable both for people with only minimal grammatical knowledge, and for those who have already done quite a bit of syntax but want to know something (more) about Minimalism. It is not historicist or comparative in orientation, and hence does not presuppose knowledge of earlier or alternative models of grammar. It is written in an approachable style, avoiding unnecessary complexity. I’ve taught earlier versions of the book to various sets of students over the past five years, and greatly benefited from their mutterings and mystification, as well as their assignments (which told me a lot about what they didn’t understand, and what I needed to explain more carefully). I’ve worked through (and refined) the exercise material with the students, and the helpful hints which the exercises contain have been developed in order to try and eliminate some of the commonest errors students make (additional helpful hints having been added to aid students who are not native speakers of English). The book is intensive and progressive in nature, which means that it starts at an elementary level but gets progressively harder as you get further into the book. Successive chapters become cumulatively more complex, in that each chapter presupposes material covered in previous chapters as well as introducing new material: hence it is helpful to go back and read material from earlier chapters every so often. In some cases, analyses presented in earlier chapters are subsequently refined or revised in the light of new assumptions made in later chapters.

Each of the chapters in the book contains a detailed text discussion of a particular topic (divided into sections to facilitate reading), together with an integral workbook section at the end of the chapter, containing exercise material (to be done as classwork or homework) with model answers and helpful hints provided. Although the book contains numerous references to (often highly technical) primary research works, the exercises are designed in such a way that they can be tackled on the basis of the coursebook material alone: indeed, given that many of the references are to highly technical primary research literature, it would be inappropriate to try and tackle them until you have read the whole book. The book also includes an extensive glossary of terminology which provides simple illustrations of how key technical terms are used (both theory-specific terms like EPP and traditional terms like subject): technical terms are written in bold print in the main text (italics being used for highlighting particular expressions – e.g. a key word appearing in an example sentence). The glossary contains entries for key technical terms in syntax which are used in a number of different places in the text (though not for terms which appear in only one part of the text and which are glossed in the text where they appear). The glossary also contains an integrated list of abbreviations.

Since I updated the book (particularly the last two chapters) somewhat hurriedly after Chomsky sent me an (as yet unpublished) paper he wrote a few weeks ago, it is inevitable that there may be typos and other problems. If you spot any, please e-mail details to me on: radford@essex.ac.uk
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1. Grammar

1.1 Overview
In broad terms, this book is concerned with aspects of grammar. Grammar is traditionally subdivided into two different but inter-related areas of study – morphology and syntax. Morphology is the study of how words are formed out of smaller units (called morphemes), and so addresses questions such as ‘What are the component morphemes of a word like *antidisestablishmentarianism*, and what is the nature of the morphological operations by which they are combined together to form the overall word?’ Syntax is the study of the way in which phrases and sentences are structured out of words, and so addresses questions like ‘What is the structure of a sentence like *What’s the president doing?* and what is the nature of the grammatical operations by which its component words are combined together to form the overall sentence structure?’ In this chapter, we begin (in §1.2) by taking a brief look at the approach to the study of syntax taken in traditional grammar: this also provides an opportunity to introduce some useful grammatical terminology. In the remainder of the chapter, we look at the approach to syntax adopted within the theory of Universal Grammar developed by Chomsky.

1.2 Traditional Grammar: Categories and Functions
Within traditional grammar, the syntax of a language is described in terms of a taxonomy (i.e. classificatory list) of the range of different types of syntactic structures found in the language. The central assumption underpinning syntactic analysis in traditional grammar is that phrases and sentences are built up of a series of constituents (i.e. syntactic units), each of which belongs to a specific grammatical category and serves a specific grammatical function. Given this assumption, the task of the linguist in analysing the syntactic structure of any given type of sentence is to identify each of the constituents in the sentence, and (for each constituent) to say what category it belongs to and what function it serves. For example, in relation to the syntax of a simple sentence like:

(1) Students protested

it would traditionally be said that the sentence consists of two constituents (the word *students* and the word *protested*), that each of these constituents belongs to a specific grammatical category (*students* being a plural noun and *protested* a past tense verb) and that each serves a specific grammatical function (*students* being the subject of the sentence, and *protested* being its predicate). The overall sentence *Students protested* has the categorial status of a clause which is finite in nature (by virtue of denoting an event taking place at a specific time), and has the semantic function of expressing a proposition which is declarative in force (in that it is used to make a statement rather than e.g. ask a question). Accordingly, a traditional grammar of English would tell us that the simplest type of finite declarative clause found in English is a sentence like (1) in which a nominal subject is followed by a verbal predicate. Let’s briefly look at some of the terminology used here.

In traditional grammar, words are assigned to grammatical categories (called parts of speech) on the basis of their semantic properties (i.e. meaning), morphological properties (i.e. the range of different forms they have), and syntactic properties (i.e. word-order properties relating to the positions they can occupy within sentences): a set of words which belong to the same category thus have a number of semantic, morphological and syntactic properties in common. There are traditionally said to be two different types of word, namely content words/contentives (= words which substantive lexical content) on the one hand and function words/functors (= words which essentially serve to mark grammatical properties) on the other. The differences between the two can be illustrated by comparing a contentive like *car* with a functor like the pronoun *they*. A noun like *car* has substantive lexical content in that it denotes an object which typically has four wheels and an engine, and it would be easy enough to draw a picture of a typical *car*; by contrast, a pronoun such as *they* has no descriptive content (e.g. you can’t draw a picture of *they*), but rather is a functor which simply marks grammatical (more specifically, person, number and case) properties in that it is a third person plural nominative pronoun. Because they have lexical semantic
content, content words often (though not always) have antonyms (i.e. ‘opposites’) – e.g. the adjective tall has the antonym short, the verb increase has the antonym decrease, and the preposition inside has the antonym outside: by contrast, a typical function word like e.g. the pronoun me has no obvious antonym. Corresponding to these two different types of (content and function) word are two different kinds of grammatical category – namely lexical/substantive categories (= categories whose members are content words) on the one hand, and functional categories (= categories whose members are function words) on the other.

Let’s begin by looking at the main lexical/substantive categories found in English – namely, noun, verb, adjective, adverb and preposition (conventionally abbreviated to N, V, A, ADV and P in order to save space). Nouns (= N) are traditionally said to have the semantic property that they denote entities: so, bottle is a noun (since it denotes a type of object used to contain liquids), water is a noun (since it denotes a type of liquid), and John is a noun (since it denotes a specific person). There are a number of distinct subtypes of noun: for example a noun like chair is a count noun in that it can be counted (cf. one chair, two chairs…), whereas a noun like furniture is a mass noun in that it denotes an uncountable mass (hence the ungrammaticality of *one furniture, *two furnitures – a prefixed star being used to indicate that an expression is ungrammatical). Likewise, a distinction is traditionally drawn between a common noun like boy (which can be modified by a determiner like the – as in The boy is lying) and a proper noun like Andrew (which cannot be used in the same way, as we see from the ungrammaticality of *The Andrew is lying). Count nouns generally have the morphological property that they have two different forms: a singular form (like horse in one horse) used to denote a single entity, and a plural form (like horses in two horses) used to denote two or more entities. Common nouns have the syntactic property that only (an appropriate kind of) noun can be used to end a four-word sentence such as They have no… In place of the dots here we could insert a singular count noun like car, or a plural count noun like friends, or a mass noun like money, but not other types of word (e.g. not see, or slowly, or up, since these are not nouns).

A second lexical/substantive category is that of verb (= V). These are traditionally said to have the semantic property that they denote actions or events: so, eat, sing, pull, and resign are all (action-denoting) verbs. From a syntactic point of view, verbs have the property that only an appropriate kind of verb (in its uninflected form) can be used to complete a three-word sentence such as They/It can… So, words like stay, leave, hide, die, starve and cry are all verbs and hence can be used in place of the dots here (but words like apple, under, pink, and if aren’t). From a morphological point of view, regular verbs like cry in English have the property that they have four distinct forms: e.g. alongside the bare (i.e. uninflected) form cry we find the present tense form cries, the past tense/perfect participle/passive participle form cried and the progressive participle form crying. (See the glossary of terminology at the end of this book if you are not familiar with these terms.)

A third lexical/substantive category is that of adjective (= A). These are traditionally said to have the semantic property of denoting states or attributes (cf. ill, happy, tired, conscientious, red, cruel, old etc.). They have the syntactic property that they can occur after be to complete a four-word sentence like They may be… (as with They may be tired/ill/happy etc.), and the further syntactic property that (if they denote a gradable property which can exist in varying degrees), they can be modified by a degree word like very/rather/somewhat (cf. She is very happy). Many (but not all) adjectives have the morphological property that they have comparative forms ending in -er and superlative forms ending in -est (cf. big/bigger/biggest).

A fourth lexical/substantive category is that of adverb (= ADV). These often have the semantic property that they denote the manner in which an action is performed (as with well in She sings well). Regular adverbs have the morphological property that they are formed from adjectives by the addition of the suffix -ly (so that corresponding to the adjective sad we have the adverb sadly). A syntactic property of adverbs is that an adverb (like e.g. badly) is the only kind of word which could be used to end a two-word sentence like She treated her ---, a three-word sentences like He treats her ---, or a four-word sentence like He worded the statement ---.

The fifth and final lexical/substantive category found in English is that of preposition (= P). Many of these have the semantic property of marking location (cf. in/on/off/inside/outside/under/above/below). They have the syntactic property that a preposition (with the appropriate kind of meaning) can be modified by right in the sense of ‘completely’, or by straight in the sense of ‘directly’ (as with the preposition down in He fell right down the stairs and the preposition to in He went straight to bed). Prepositions have the
morphological property that they are invariable/uninflected forms (e.g. the preposition off has no past tense form *offed, no superlative form *offest, and so on).

In addition to the five lexical/substantive categories identified above, English also has a number of functional categories. One such functional category is that of determiner (= D) – a category whose members are traditionally said to include the definite article the and the demonstrative determiners this/that/these/those. They are called determiners because they have the semantic property that they determine specific semantic properties of the noun expression that they introduce, marking it as a definite referring expression: for example, an expression like the car in a sentence such as Shall we take the car? is a definite referring expression in the sense that it refers to a definite (specific) car which is assumed to be familiar to the hearer/addressee. (On the nature of determiners, see Spinillo 2004.) A related class of words are those which belong to the functional category quantifier (= Q), denoting expressions of quantity (e.g. some/all/no/any/each/every/most/much/many).

A further type of functional category found in English is that of pronoun (= PRN). Pronouns are items which are said to ‘stand in place of’ (the meaning of the prefix pro-) or ‘refer back to’ noun expressions. However, there are reasons to think that there are a number of different types of pronoun found in English and other languages (See Déchaine and Wiltschko 2002). For example, in sentences such as John has a red car and Jim has a blue one, the word one is traditionally said to be a pronoun because it has no lexical semantic content of its own, but rather takes its content from its antecedent (i.e. one refers back to the noun car and so one is interpreted as having the same meaning as car). However, from a morphological perspective, the pronoun one behaves like a regular count noun in that it has a plural form ending in -s (as in I’ll take the green apples if you haven’t got any red ones). So, more accurately, we could say that one is an N-pronoun (or pronominal noun). By contrast, in a sentence like Many miners were rescued, but some died, the word some seems to function as a Q-pronoun (i.e. a pronominal quantifier). And in a sentence like These apples are ripe, but those aren’t, the word those seems to be a D-pronoun (i.e. a pronominal determiner). Indeed, some linguists have argued that so-called personal pronouns like I/me/we/us/you/your/yourself/yours/yourself/them are also D-pronouns: the rationale for this is that some such pronouns can be used as determiners which modify a following noun (as in We republicans don’t trust you democrats, where we could be argued to be a determiner modifying the noun republicans, and you could be seen as a determiner modifying the noun democrats). While, as noted here, pronouns can be argued to belong to a number of distinct types of category, in order to simplify discussion I shall simply refer to them as belonging to the category PRN throughout this book.

Another type of functional category found in English is that of auxiliary. They have the semantic property of marking grammatical properties such as tense, aspect, voice, or mood (See the Glossary of terminology at the end of the book if you are not sure what these terms mean). Auxiliaries have the syntactic property that (unlike lexical/main verbs) they can be inverted with their subject in questions (so that corresponding to a statement like It is raining we have the question Is it raining, where the auxiliary is has moved in front of the subject it). The items italicised in (2) below (in the use illustrated there) are traditionally categorised as auxiliaries taking a [bracketed] complement containing a bold-printed verb:

(2)(a) He has/had [gone] (b) She is/has [staying at home]
(c) They are/were [taken away for questioning] (d) He really does/did [say a lot]
(e) You can/could [help us] (f) They may/might [come back]
(g) He will/would [get upset] (h) I shall/should [return]

In the uses illustrated here, have/be in (2a/b) are (perfect/progressive) aspect auxiliaries, be in (2c) is a (passive) voice auxiliary, do in (2d) an expletive or dummy auxiliary (i.e. one with no intrinsic lexical semantic content), and can/could/may/might/will/would/shall/should/must/ought in (2e-h) modal auxiliaries. What auxiliaries in sentences like those above have in common is the fact that they inflect for present/past tense. Hence, in work in syntax over the past 10 years or so, they have been said to belong to the category T (= tense-marker).

An interesting word which has been argued to be related to tense-marking auxiliaries in work over the past 30 years or so is the infinitive particle to, in sentences such as:

(3) They are now expecting the president to be impeached tomorrow

In a sentence like (3), infinitival to seems to have future time-reference (in that the act of impeachment will take place at some time in the future), and this is why we can use the word tomorrow in the to-clause.
In this respect, infinitival *to* seems to have much the same function as the auxiliary *will* in *They are now expecting that the president will be impeached tomorrow*. If infinitival *to* is indeed an infinitival tense marker, then it belongs to the same category T as present/past tense auxiliaries such as *is/was*. The difference between auxiliaries and infinitival *to* is that most auxiliaries overtly inflect for present/past tense (though this is not true of the invariable auxiliary *must*), whereas infinitival *to* is invariable in form. (For a technical discussion of tense, see Julien 2001.) We can thus say that an auxiliary like *will* is a finite T constituent, whereas infinitival *to* is a non-finite T.

The last type of functional category which we will look at is a kind of word (like each of the words italicised in the examples below) which is traditionally termed a (subordinating) conjunction:

\[(4)\]  
\(\begin{align*}
(a) & \quad \text{I think [that you may be right]} \\
(b) & \quad \text{I doubt [if you can help me]} \\
(c) & \quad \text{I’m anxious [for you to receive the best treatment possible]}
\end{align*}\]

Each of the bracketed clauses in (4) is a complement clause, in that it functions as the complement of the word immediately preceding it (*think/doubt/anxious*); for this reason, the italicised word which introduces each clause is known in work since Bresnan (1970) as a complementiser (= C), and this is the terminology which will be adopted throughout this book. Complementisers are functors in the sense that they encode particular sets of grammatical properties. For example, complementisers encode (non)finiteness by virtue of the fact that they are intrinsically finite or nonfinite. More specifically, the complementisers *that* and *if* are inherently finite in the sense that they can only be used to introduce a finite clause (i.e. a clause containing a present or past tense auxiliary or verb, like the present-tense auxiliaries *may* and *can* in 4a and 4b); by contrast, *for* is an inherently infinitival complementiser, and so can be used to introduce a clause containing infinitival *to* (as in 4c). Moreover, *that* introduces a declarative clause (i.e. one which has the force of a statement), *if* introduces an interrogative clause (i.e. one which has the force of a question), and *for* introduces an irrealis clause (i.e. one relating to a hypothetical event which hasn’t yet taken place and may or may not take place at some stage in the future). Hence, we can say *that* is a finite declarative complementiser, *if* is a finite interrogative complementiser, and *for* is an infinitival irrealis complementiser.

Using the set of syntactic categories outlined above, we can employ the traditional labelled bracketing technique to categorise words (i.e. assign them to grammatical categories) in a way which describes how they are being used in a particular sentence such as:

\[(5)\]  
\[
[D \text{ The}] [N \text{ president}] [T \text{ is}] [ADV clearly] [V \text{ feeling}] [A \text{ angry}] [C \text{ that}] [N \text{ Congress}] [T \text{ has}] [V \text{ refused}] [T \text{ to}] [V \text{ negotiate}] [P \text{ with}] [PRN \text{ him}]
\]

The labelled bracketing in (5) tells us that *the* is a D/determiner, *president* a N/noun, *is* a T/present-tense auxiliary, *clearly* an ADV/advverb, *feeling* a V/verb, *angry* an A/adjective, *that* a C/complementiser, *Congress* a N/noun, *has* a T/present-tense auxiliary, *refused* a V/verb, *to* a T/infinitival tense particle, *negotiate* a V/verb, *with* a P/preposition, and *him* a PRN/pronoun.

The discussion of grammatical categories presented above is merely a brief sketch: for a more detailed discussion of the range of categories found in English see chapter 2 of my (2004) *English Syntax* or *Minimalist Syntax* books. However, it suffices to illustrate the point that when traditional grammarians analyse the syntax of sentences, they begin by assigning each of the words in the sentence to a grammatical category which describes how it is being used in the sentence concerned. However, as noted at the beginning of this section, traditional grammarians are also concerned to describe the grammatical functions which words and other expressions fulfil within the sentences containing them. We can illustrate this point in terms of the following set of sentences:

\[(6)\]  
\(\begin{align*}
(a) & \quad \text{John smokes} \\
(b) & \quad \text{The president smokes} \\
(c) & \quad \text{The president of Utopia smokes} \\
(d) & \quad \text{The former president of the island paradise of Utopia smokes}
\end{align*}\]

Sentence (6a) comprises the noun *John* which serves the function of being the subject of the sentence (and denotes the person performing the act of smoking), and the verb *smokes* which serves the function of being the predicate of the sentence (and describes the act being performed). In (6a), the subject is the
Now consider the following set of sentences:

(7)(a) John smokes cigars
(b) John smokes Cuban cigars
(c) John smokes Cuban cigars imported from Havana
(d) John smokes a specific brand of Cuban cigars imported by a friend of his from Havana

Sentence (7a) comprises the subject John, the predicate smokes and the complement (or direct object) cigars. (The complement cigars describes the entity on which the act of smoking is being performed; as this example illustrates, subjects normally precede the verb with which they are associated in English, whereas complements typically follow the verb.) The complement in (7a) is the single noun cigars; but a complement can also be a phrase: in (7b), the complement of smokes is the phrase Cuban cigars; in (7c) the complement is the phrase Cuban cigars imported from Havana; and in (7d) the complement is the phrase a specific brand of Cuban cigars imported by a friend of his from Havana. A verb which has a noun or pronoun expression as its direct object complement is traditionally said to be transitive.

From a semantic perspective, subjects and complements share in common the fact that they generally represent entities directly involved in the particular action or event described by the predicate: to use the relevant semantic terminology, we can say that subjects and complements are arguments of the predicate with which they are associated. Predicates may have one or more arguments, as we see from sentences such as (8) below, where each of the bracketed nouns is a different argument of the italicised predicate:

(8)(a) [John] resigned  (b) [John] felt [remorse]  (c) [John] sent [Mary] [flowers]

A predicate like resign in (8a) which has a single argument is said to function as a one-place predicate (in the relevant use); one like feel in (8b) which has two arguments is a two-place predicate; and one like send in (8c) which has three arguments is a three-place predicate.

In addition to predicates and arguments, sentences can also contain adjuncts, as we can illustrate in relation to (9) below:

(9)(a) The president smokes a cigar after dinner
(b) The president smokes a cigar in his office

In both sentences in (9), smokes functions as a two-place predicate whose two arguments are its subject the president and its complement a cigar. But what is the function of the phrase after dinner which also occurs in (9a)? Since after dinner isn’t one of the entities directly involved in the act of smoking (i.e. it isn’t consuming or being consumed), it isn’t an argument of the predicate smoke. On the contrary, after dinner simply serves to provide additional information about the time when the smoking activity takes place. In much the same way, the italicised expression in his office in (9b) provides additional information about the location of the smoking activity. An expression which serves to provide (optional) additional information about the time or place (or manner, or purpose etc.) of an activity or event is said to serve as an adjunct. So, after dinner and in his office in (9a/b) are both adjuncts.

So far, all the sentences we have looked at in (6-9) have been simple sentences which contain a single clause. However, alongside these we also find complex sentences which contain more than one clause, like (10) below:

(10) Mary knows John smokes

If we take the traditional definition of a clause as a predication structure (more precisely, a structure containing a predicate which has a subject, and which may or may not also contain one or more complements and adjuncts), it follows that since there are two predicates (knows and smokes) in (10), there are correspondingly two clauses – the smokes clause on the one hand, and the knows clause on the other. The smokes clause comprises the subject John and the predicate smokes; the knows clause comprises the subject Mary, the predicate knows and the complement John smokes. So, the complement of knows here is itself a clause – namely the clause John smokes. More precisely, the smokes clause is a complement clause (because it serves as the complement of knows), while the knows clause is the main clause (or principal clause or independent clause or root clause). The overall sentence (10) Mary knows John
smokes is a complex sentence because it contains more than one clause. In much the same way, (11) below is also a complex sentence:

(11) The press clearly think the president deliberately lied to Congress

Once again, it comprises two clauses – one containing the predicate think, the other containing the predicate lie. The main clause comprises the subject the press, the adjunct clearly, the predicate think and the complement clause the president deliberately lied to Congress. The complement clause in turn comprises the subject the president, the adjunct deliberately, the predicate lie, and the complement to Congress.

As was implicit in our earlier classification of (1) as a finite clause, traditional grammars draw a distinction between finite clauses (which describe events taking place at a particular time) and nonfinite clauses (which describe hypothetical or projected future events). In this connection, consider the contrast between the italicised clauses below (all three of which function as the complement of remember):

(12)(a) John couldn’t remember what pills he is taking
(b) John couldn’t remember what pills he took
(c) John couldn’t remember what pills to take

In (12a), the clause what pills he is taking is finite by virtue of containing present-tense is: likewise, the clause what pills he took in (12b) is finite by virtue of containing past-tense took. However, the clause what pills to take in (12c) is nonfinite by virtue of containing no tense specification – take here is an infinitive form which is not inflected for tense, as we see from the fact that it could not be replaced by the past tense form took here (cf. *‘John couldn’t remember what pills to took’ – the star indicating ungrammaticality).

Whether or not a clause is finite in turn determines the kind of subject it can have, in that finite clauses can have a nominative pronoun like he as their subject, but nonfinite clauses cannot (as we see from the ungrammaticality of *‘John couldn’t remember what pills he to take’). Accordingly, one way of telling whether a particular clause is finite or not is to see whether it can have a nominative pronoun (like I/we/he/she/they) as its subject. In this connection, consider whether the italicised clauses in the dialogues in (13a, b) below are finite or nonfinite:

(13)(a) SPEAKER A I know you cheat on me
SPEAKER B OK, I admit it. I cheat on you. But not with any of your friends.
(b) SPEAKER A I know you cheat on me
SPEAKER B Me cheat on you? No way! I never would!

The fact that the italicised clause in (13a) has the nominative subject I suggests that it is finite, and hence that the verb cheat (as used in the italicised sentence in 13a) is a first person singular present tense form. By contrast, the fact that the italicised clause in (13b) has the accusative subject me suggests that it is nonfinite, and that the verb cheat (as used in the italicised sentence in 13b) is a bare infinitive form (and indeed this is clear from sentences like Me be a cheat? No way! where we find the infinitive form be).

In addition to being finite or nonfinite, each clause within a sentence has a specific force. In this connection, consider the following simple (single-clause) sentences:

(14)(a) He went home
(b) Are you feeling OK?
(c) You be quiet!
(d) What a great idea that is!

A sentence like (14a) is traditionally said to be declarative in force, in that it is used to make a statement. (14b) is interrogative in force in that it is used to ask a question. (14c) is imperative in force, by virtue of being used to issue an order or command. (14d) is exclamative in force, in that it is used to exclaim surprise or delight. In complex sentences, each clause has its own force, as we can see in relation to (15) below:

(15)(a) He asked where she had gone
(b) Did you know that he has retired?
(c) Tell her what a great time we had!

In (15a), the main (asked) clause is declarative, whereas the complement (gone) clause is interrogative; in (15b) the main (know) clause is interrogative, whereas the complement (retired) clause is declarative; and
in (15c), the main (tell) clause is imperative, whereas the complement (had) clause is exclamative.

We can summarise this section as follows. From the perspective of traditional grammar, the syntax of a language is described in terms of a taxonomy (i.e. a classificatory list) of the range of different phrase-, clause- and sentence-types found in the language. So, for example, a typical traditional grammar of (say) English will include chapters on the syntax of negatives, interrogatives, exclamatives, imperatives and so on. The chapter on interrogatives will note (e.g.) that in main-clause questions in English like ‘Is he winning?’ the present-tense auxiliary is inverts with (i.e. moves in front of) the subject he, but not in complement clause questions like the if-clause in ‘I wonder if he is winning’, and will typically not be concerned with trying to explain why auxiliary inversion applies in main clauses but not complement clauses: this reflects the fact that the primary goal of traditional grammar is description rather than explanation.

1.3 Universal Grammar

In contrast to the taxonomic approach adopted in traditional grammar, Chomsky takes a cognitive approach to the study of grammar. For Chomsky, the goal of the linguist is to determine what it is that native speakers know about their native language which enables them to speak and understand the language, and how that linguistic knowledge might be represented in the mind/brain: hence, in studying language, we are studying a specific kind of cognition (i.e. human knowledge). In a fairly obvious sense, any native speaker of a language can be said to know the grammar of his or her native language. For example, any native speaker of English can tell you that the negative counterpart of I like syntax is I don’t like syntax, and not e.g. *I no like syntax: in other words, native speakers know how to combine words together to form expressions (e.g. negative sentences) in their language. Likewise, any native speaker of English can tell you that a sentence like She loves me more than you is ambiguous and has two interpretations which can be paraphrased as ‘She loves me more than she loves you’ and ‘She loves me more than you love me’: in other words, native speakers also know how to interpret (i.e. assign meaning to) expressions in their language. However, it is important to emphasise that this grammatical knowledge of how to form and interpret expressions in your native language is tacit (i.e. subconscious) rather than explicit (i.e. conscious): so, it’s no good asking a native speaker of English a question such as ‘How do you form negative sentences in English?’ since human beings have no conscious awareness of the processes involved in speaking and understanding their native language. To introduce a technical term devised by Chomsky, we can say that native speakers have grammatical competence in their native language: by this, we mean that they have tacit knowledge of the grammar of their language – i.e. of how to form and interpret words, phrases and sentences in the language.

In work dating back to the 1960s, Chomsky has drawn a distinction between competence (the native speaker’s tacit knowledge of his or her language) and performance (what people actually say or understand by what someone else says on a given occasion). Competence is ‘the speaker-hearer’s knowledge of his language’, while performance is ‘the actual use of language in concrete situations’ (Chomsky, 1965, p. 4). Very often, performance is an imperfect reflection of competence: we all make occasional slips of the tongue, or occasionally misinterpret something which someone else says to us. However, this doesn’t mean that we don’t know our native language or that we don’t have competence in it. Misproductions and misinterpretations are performance errors, attributable to a variety of performance factors like tiredness, boredom, drunkenness, drugs, external distractions, and so forth. A grammar of a language tells you what you need to know in order to have native-like competence in the language (i.e. to be able to speak the language like a fluent native speaker): hence, it is clear that grammar is concerned with competence rather than performance. This is not to deny the interest of performance as a field of study, but merely to assert that performance is more properly studied within the different – though related – discipline of Psycholinguistics, which studies the psychological processes underlying speech production and comprehension.

Thus, when we study the grammatical competence of a native speaker of a language like English we’re studying a cognitive system internalised within the brain/mind of native speakers of English which is the product of a ‘cognitive organ’ which is ‘shared among human beings and in crucial respects unique to them’ (Chomsky 2006, p.1). In the terminology adopted by Chomsky (1986a, pp. 19-56), our ultimate goal in studying competence is to characterise the nature of the internalised linguistic system (or
**I-language**, as Chomsky terms it, which makes native speakers proficient in English. Such an approach has obvious implications for the descriptive linguist who is concerned to develop a grammar of a particular language like English. According to Chomsky (1986a, p.22) a grammar of a language is ‘a theory of the I-language ... under investigation’. This means that in devising a grammar of English, we are attempting to uncover the internalised linguistic system (= I-language) possessed by native speakers of English – i.e. we are attempting to characterise a mental state (a state of competence, and thus linguistic knowledge). See Smith (1999) for more extensive discussion of the notion of I-language.

Chomsky’s ultimate goal is to devise a theory of *Universal Grammar*/UG which generalises from the grammars of particular I-languages to the grammars of all possible natural (i.e. human) I-languages. He defines UG (1986a, p.23) as ‘the theory of human I-languages ...that identifies the I-languages that are humanly accessible under normal conditions’. (The expression ‘are humanly accessible’ means ‘can be acquired by human beings’.) In other words, UG is a theory about the nature of possible grammars of human languages: hence, a theory of Universal Grammar answers the question: ‘What are the defining characteristics of the grammars of human I-languages?’

There are a number of criteria of adequacy which a Theory of Universal Grammar must satisfy. One such criterion (which is implicit in the use of the term *Universal Grammar*) is universality, in the sense that a theory of UG must provide us with the tools needed to provide a descriptively adequate grammar for any and every human I-language (i.e. a grammar which correctly describes how to form and interpret expressions in the relevant language). After all, a theory of UG would be of little interest if it enabled us to describe the grammar of English and French, but not that of Swahili or Chinese.

However, since the ultimate goal of any theory is explanation, it is not enough for a theory of Universal Grammar simply to list sets of universal properties of natural language grammars; on the contrary, a theory of UG must seek to explain the relevant properties. So, a key question for any adequate theory of UG to answer is: ‘Why do grammars of human I-languages have the properties they do?’ The requirement that a theory should explain why grammars have the properties they do is conventionally referred to as the criterion of explanatory adequacy.

Since the theory of Universal Grammar is concerned with characterising the properties of natural (i.e. human) I-language grammars, an important question which we want our theory of UG to answer is: ‘What are the defining characteristics of human I-languages which differentiate them from, for example, artificial languages like those used in mathematics and computing (e.g. Java, Prolog, C etc.), or from animal communication systems (e.g. the tail-wagging dance performed by bees to communicate the location of a food source to other bees)?’ It therefore follows that the descriptive apparatus which our theory of Universal Grammar allows us to make use of in devising natural language grammars must not be so powerful that it can be used to describe not only natural languages, but also computer languages or animal communication systems (since any such excessively powerful theory wouldn’t be able to pinpoint the criterial properties of natural languages which differentiate them from other types of communication system). In other words, a third condition which we have to impose on our theory of language is that it be maximally constrained: that is, we want our theory to provide us with technical devices which are so constrained (i.e. limited) in their expressive power that they can only be used to describe natural languages, and are not appropriate for the description of other communication systems. A theory which is constrained in appropriate ways should enable us to provide a principled explanation for why certain types of syntactic structure and syntactic operation simply aren’t found in natural languages. One way of constraining grammars is to suppose that grammatical operations obey certain linguistic principles, and that any operation which violates the relevant principles leads to ungrammaticality: see the discussion in §1.5 below for a concrete example.

A related requirement is that linguistic theory should provide grammars which make use of the minimal theoretical apparatus required: in other words, grammars should be as simple as possible. Much earlier work in syntax involved the postulation of complex structures and principles: as a reaction to the excessive complexity of this kind of work, Chomsky in work over the past two decades has made the requirement to minimise the theoretical and descriptive apparatus used to describe language the cornerstone of the Minimalist Program for Linguistic Theory which he has been developing (in work dating back to Chomsky 1993, 1995). In more recent work, Chomsky (1998, 1999, 2001, 2002, 2005a, 2005b, 2006) has suggested that language is a perfect system of optimal design in the sense that natural language grammars create structures which are designed to interface perfectly with other components of the mind – more specifically with speech and thought systems, so that (in the words of Chomsky 2005b,

To make this discussion rather more concrete, let’s suppose that a grammar of a language is organised as follows. One component of a grammar is a Lexicon (= dictionary = list of all the lexical items/words in the language and their linguistic properties), and in forming a given sentence out of a set of words, we first have to take the relevant words out of the Lexicon. Our chosen words are then combined together by a series of syntactic computations in the syntax (i.e. in the syntactic/computational component of the grammar), thereby forming a syntactic structure. This syntactic structure serves as input into two other components of the grammar. One is the semantic component which maps (i.e. ‘converts’) the syntactic structure into a corresponding semantic representation (i.e. to a representation of linguistic aspects of its meaning): the other is a PF component, so called because it maps the syntactic structure into a PF representation (i.e. a representation of its Phonetic Form, giving us a phonetic spellout for each word, telling us how it is pronounced). The semantic representation interfaces with systems of thought, and the PF representation with systems of speech – as shown in diagrammatic form below:

Chomsky (2005b, p.3 refers to the interface with thought systems as the ‘conceptual-intentional interface (C-I)’, and to the interface with speech systems as the ‘sensory-motor interface (SM)’. In terms of the model in (16), an important constraint is that the (semantic and PF) representations which are ‘handed over’ to the (thought and speech) interface systems should contain only elements which are legible by the appropriate interface system – so that the semantic representations handed over to thought systems contain only elements contributing to meaning, and the PF representations handed over to speech systems contain only elements which contribute to phonetic form (i.e. to determining how the sentence is pronounced).

The neurophysiological mechanisms which underlie linguistic competence make it possible for young children to acquire language in a remarkably short period of time. Accordingly, a fourth condition which any adequate linguistic theory must meet is that of learnability: it must provide grammars which are learnable by young children in a short period of time. The desire to maximise the learnability of natural language grammars provides an additional argument for minimising the theoretical apparatus used to describe languages, in the sense that the simpler grammars are, the simpler it is for children to acquire them.

1.4 The Language Faculty

Mention of learnability leads us to consider the related goal of developing a theory of language acquisition. An acquisition theory is concerned with the question of how children acquire grammars of their native languages. Children generally produce their first recognisable word (e.g. Mama or Dada) by the age of 12 months. For the next 6 months or so, there is little apparent evidence of grammatical development in their speech production, although the child’s productive vocabulary typically increases by about five words a month until it reaches around 30 words at age 18 months. Throughout this single-word stage, children’s utterances comprise single words spoken in isolation: e.g. a child may say Apple when reaching for an apple, or Up when wanting to climb up onto her mother’s knee. During the single-word stage, it is difficult to find any clear evidence of the acquisition of grammar, in that children do not make productive use of inflections (e.g. they don’t add the plural -s ending to nouns, or the past tense -d ending to verbs), and don’t productively combine words together to form two- and three-word utterances.

At around the age of 18 months (though with considerable variation from one child to another), we find the first visible signs of the acquisition of grammar: children start to make productive use of inflections
(e.g. using plural nouns like *doggies* alongside the singular form *doggy*, and inflected verb forms like *going/gone* alongside the uninflected verb form *go*), and similarly start to produce elementary two- and three-word utterances such as *Want Teddy, Eating cookie, Daddy gone office*, etc. From this point on, there is a rapid expansion in their grammatical development, until by the age of around 30 months they have typically acquired most of the inflections and core grammatical constructions used in English, and are able to produce adult-like sentences such as *Where’s Mummy gone? What’s Daddy doing? Can we go to the zoo, Daddy?* etc. (though occasional morphological and syntactic errors persist until the age of four years or so – e.g. *We goed there with Daddy, What we can do?* etc.).

So, the central phenomenon which any theory of language acquisition must seek to explain is this: how is it that after a long drawn-out period of many months in which there is no obvious sign of grammatical development, at around the age of 18 months there is a sudden spurt as multiword speech starts to emerge, and a phenomenal growth in grammatical development then takes place over the next 12 months? This *uniformity* and (once the spurt has started) *rapidity* in the pattern of children’s linguistic development are the central facts which a theory of language acquisition must seek to explain. But how?

Chomsky maintains that the most plausible explanation for the uniformity and rapidity of first language acquisition is to posit that the course of acquisition is determined by a biologically endowed innate *Faculty of Language/FL* (or *language acquisition program*, to borrow a computer software metaphor) within the brain, which provides children with a genetically transmitted algorithm (i.e. set of procedures) for developing a grammar, on the basis of their linguistic *experience* (i.e. on the basis of the speech input they receive). The way in which Chomsky visualises the acquisition process can be represented schematically as in (17) below (where L is the language being acquired):

(17) Experience of L → Faculty of Language/FL → Grammar of L

Children acquiring a language will observe people around them using the language, and the set of expressions in the language which a child hears (and the contexts in which they are used) in the course of acquiring the language constitute the child’s linguistic *experience* of the language. This experience serves as input to the child’s Faculty of Language/FL, which incorporates a set of UG principles (i.e. principles of Universal Grammar) which enable the child to use the experience to devise a grammar of the language being acquired. Thus, the input to the language faculty is the child’s experience, and the output of the language faculty is a grammar of the language being acquired.

The hypothesis that the course of language acquisition is determined by an innate language faculty is known popularly as the *innateness hypothesis*. Chomsky maintains that the ability to speak and acquire languages is unique to human beings, and that natural languages incorporate principles which are also unique to humans and which reflect the nature of the human mind:

> Whatever evidence we do have seems to me to support the view that the ability to acquire and use language is a species-specific human capacity, that there are very deep and restrictive principles that determine the nature of human language and are rooted in the specific character of the human mind. (Chomsky 1972, p. 102)

Moreover, he notes, language acquisition is an ability which all humans possess, entirely independently of their general intelligence:

> Even at low levels of intelligence, at pathological levels, we find a command of language that is totally unattainable by an ape that may, in other respects, surpass a human imbecile in problem-solving activity and other adaptive behaviour. (Chomsky 1972, p. 10)

In addition, the apparent uniformity in the types of grammars developed by different speakers of the same language suggests that children have genetic guidance in the task of constructing a grammar of their native language:

> We know that the grammars that are in fact constructed vary only slightly among speakers of the same language, despite wide variations not only in intelligence but also in the conditions under which language is acquired. (Chomsky 1972, p. 79)
Furthermore, the rapidity of acquisition (once the grammar spurt has started) also points to genetic guidance in grammar construction:

Otherwise it is impossible to explain how children come to construct grammars...under the given conditions of time and access to data. (Chomsky 1972, p. 113)

(The sequence ‘under...data’ means simply ‘in so short a time, and on the basis of such limited linguistic experience.’) What makes the uniformity and rapidity of acquisition even more remarkable is the fact that the child’s linguistic experience is often degenerate (i.e. imperfect), since it is based on the linguistic performance of adult speakers, and this may be a poor reflection of their competence:

A good deal of normal speech consists of false starts, disconnected phrases, and other deviations from idealised competence. (Chomsky 1972, p. 158)

If much of the speech input which children receive is ungrammatical (because of performance errors), how is it that they can use this degenerate experience to develop a (competence) grammar which specifies how to form grammatical sentences? Chomsky’s answer is to draw the following analogy:

Descartes asks: how is it when we see a sort of irregular figure drawn in front of us we see it as a triangle? He observes, quite correctly, that there’s a disparity between the data presented to us and the percept that we construct. And he argues, I think quite plausibly, that we see the figure as a triangle because there’s something about the nature of our minds which makes the image of a triangle easily constructible by the mind. (Chomsky 1968, p. 687)

The obvious implication is that in much the same way as we are genetically predisposed to analyse shapes (however irregular) as having specific geometric properties, so too we are genetically predisposed to analyse sentences (however ungrammatical) as having specific grammatical properties. (For evaluation of this kind of degenerate input argument, see Pullum and Scholz 2002, Thomas 2002, Sampson 2002, Fodor and Crowther 2002, Lasnik and Uriagereka 2002, Legate and Yang 2002, Crain and Pietroski 2002, and Scholz and Pullum 2002.)

A further argument Chomsky uses in support of the innateness hypothesis relates to the fact that language acquisition is an entirely subconscious and involuntary activity (in the sense that you can’t consciously choose whether or not to acquire your native language – though you can choose whether or not you wish to learn chess); it is also an activity which is largely unguided (in the sense that parents don’t teach children to talk):

Children acquire...languages quite successfully even though no special care is taken to teach them and no special attention is given to their progress. (Chomsky 1965, pp. 200-1)

The implication is that we don’t learn to have a native language, any more than we learn to have arms or legs; the ability to acquire a native language is part of our genetic endowment – just like the ability to learn to walk.

Studies of language acquisition lend empirical support to the innateness hypothesis. Research has suggested that there is a critical period for the acquisition of syntax, in the sense that children who learn a given language before puberty generally achieve native competence in it, whereas those acquire a (first or second) language after the age of 9 or 10 years rarely manage to achieve native-like syntactic competence: see Lenneberg (1967), Hurford (1991) and Smith (1998, 1999) for discussion. A particularly poignant example of this is a child called Genie (See Curtiss 1977, Rymer 1993), who was deprived of speech input and kept locked up on her own in a room until age 13. When eventually taken into care and exposed to intensive language input, her vocabulary grew enormously, but her syntax never developed. This suggests that the acquisition of syntax is determined by an innate ‘language acquisition programme’ which is in effect switched off (or gradually atrophies) around the onset of puberty. (For further discussion of the innateness hypothesis, see Antony and Hornstein 2002.)

As Chomsky (2005b, p.1) notes, in studying language, our goal is to uncover ‘the properties that are specific to human language, that is, to the “faculty of language” FL. To borrow Jespersen’s formulation eighty years ago, the goal is to unearth “the great principles underlying the grammars of all languages” with the goal of “gaining a deeper insight into the innermost nature of human language and of human thought.” The biolinguistic perspective views FL as an “organ of the body,” one of many subcomponents of an organism that interact in its normal life.’
However, Chomsky (2006, p.1) notes that some properties of human language may reflect ‘principles of biology more generally, and perhaps even more fundamental principles about the natural world’. Accordingly, ‘development of language in the individual must involve three factors: (1) genetic endowment, which sets limits on the attainable languages, thereby making language acquisition possible; (2) external data, converted to the experience that selects one or another language within a narrow range; (3) principles not specific to FL’ (Chomsky 2006, p.2: FL = Faculty of Language).

The ‘third factor principles’ referred to under (3) ‘enter into all facets of growth and evolution’ and include ‘principles of efficient computation’ (Chomsky 2006, p.2) and – more generally – ‘properties of the human brain that determine what cognitive systems can exist, though too little is yet known about these to draw specific conclusions about the design of FL’ (Chomsky 2006, fn.6).

1.5 Principles of Universal Grammar

If (as Chomsky claims) human beings are biologically endowed with an innate language faculty, an obvious question to ask is what is the nature of the language faculty. An important point to note in this regard is that children can in principle acquire any natural language as their native language (e.g. Afghan orphans brought up by English-speaking foster parents in an English-speaking community acquire English as their first language). It therefore follows that the language faculty must incorporate a theory of Universal Grammar/UG which enables the child to develop a grammar of any natural language on the basis of suitable linguistic experience of the language (i.e. sufficient speech input). Experience of a particular language L (examples of words, phrases and sentences in L which the child hears produced by native speakers of L in particular contexts) serves as input to the child’s language faculty which incorporates a theory of Universal Grammar providing the child with a procedure for developing a grammar of L.

If the acquisition of grammatical competence is indeed controlled by a genetically endowed language faculty incorporating a theory of UG, then it follows that certain aspects of child (and adult) competence are known without experience, and hence must be part of the genetic information about language with which we are biologically endowed at birth. Such aspects of language would not have to be learned, precisely because they form part of the child’s genetic inheritance. If we make the (plausible) assumption that the language faculty does not vary significantly from one (normal) human being to another, those aspects of language which are innately determined will also be universal. Thus, in seeking to determine the nature of the language faculty, we are in effect looking for UG principles (i.e. principles of Universal Grammar) which determine the very nature of language.

But how can we uncover such principles? The answer is that since the relevant principles are posited to be universal, it follows that they will affect the application of every relevant type of grammatical operation in every language. Thus, detailed analysis of one grammatical construction in one language could reveal evidence of the operation of principles of Universal Grammar. By way of illustration, let’s look at question-formation in English. In this connection, consider the following dialogue:

(18) SPEAKER A: He had said someone would do something
       SPEAKER B: He had said who would do what?

In (18), speaker B largely echoes what speaker A says, except for replacing someone by who and something by what. For obvious reasons, the type of question produced by speaker B in (18) is called an echo question. However, speaker B could alternatively have replied with a non-echo question like that below:

(19) Who had he said would do what?

If we compare the echo question He had said who would do what? in (18) with the corresponding non-echo question Who had he said would do what? in (19), we find that (19) involves two movement operations which are not found in (18). One is an auxiliary inversion operation by which the past tense auxiliary had is moved in front of its subject he. The other is a wh-movement operation by which the wh-word who is moved to the front of the overall sentence, and positioned in front of had. (A wh-word is a word like who/what/where/when etc. beginning with wh.)
A closer look at questions like (19) provides evidence that there are UG principles which constrain the way in which movement operations may apply. An interesting property of the questions in (18b, 19) is that they contain two auxiliaries (had and would) and two wh-words (who and what). Now, if we compare (19) with the corresponding echo-question in (18), we find that the first of the two auxiliaries (had) and the first of the wh-words (who) is moved to the front of the sentence in (19). If we try inverting the second auxiliary (would) and fronting the second wh-word (what), we end up with ungrammatical sentences, as we see from (20c-e) below (key items are bold-printed/italicised, and the corresponding echo question is given in parentheses; 20a is repeated from the echo question in 18b, and 20b from 19):

(20)(a) He had said who would do what? (= echo question)
(b) Who had he said would do what? (cf. He had said who would do what?)
(c) *Who would he had said do what? (cf. He had said who would do what?)
(d) *What had he said who would do? (cf. He had said who would do what?)
(e) *What would he had said who do? (cf. He had said who would do what?)

If we compare (20b) with its echo-question counterpart (20a) He had said who would do what? we see that (20b) involves preposing the first wh-word who and the first auxiliary had, and that this results in a grammatical sentence. By contrast, (20c) involves preposing the first wh-word who and the second auxiliary would; (20d) involves preposing the second wh-word what and the first auxiliary had; and (20e) involves preposing the second wh-word what and the second auxiliary would. The generalisation which emerges from the data in (20) is that auxiliary inversion preposes the closest auxiliary had (i.e. the one nearest the beginning of the sentence in (20a) above) and likewise wh-fronting preposes the closest wh-expression who. The fact that two quite distinct different movement operations (auxiliary inversion and wh-movement) are subject to the same locality condition (which requires preposing of the most local – i.e. closest – expression of the relevant type) suggests that one of the principles of Universal Grammar incorporated into the language faculty is a Locality Principle which can be outlined informally as:

(21) **Locality Principle**
Grammatical operations are local

In consequence of (21), auxiliary inversion preposes the closest auxiliary, and wh-movement preposes the closest wh-expression. It seems reasonable to suppose that (21) is a principle of Universal Grammar (rather than an idiosyncratic property of question-formation in English). In fact, the strongest possible hypothesis we could put forward is that (21) holds of all grammatical operations in all natural languages, not just of movement operations; and indeed we shall see in later chapters that other types of grammatical operation (including agreement and case assignment) are subject to a similar locality condition. If so, and if we assume that abstract grammatical principles which are universal are part of our biological endowment, then the natural conclusion to reach is that (21) is a principle which is biologically wired into the language faculty, and which thus forms part of our genetic make-up.

A theory of grammar which posits that grammatical operations are constrained by innate principles of UG offers the important advantage that it minimises the burden of grammatical learning imposed on the child (in the sense that children do not have to learn e.g. that auxiliary inversion affects the first auxiliary in a sentence, or that wh-movement likewise affects the first wh-expression). This is an important consideration, since we saw earlier that learnability is a criterion of adequacy for any theory of grammar – i.e. any adequate theory of grammar must be able to explain how children come to learn the grammar of their native language(s) in such a rapid and uniform fashion. The UG theory developed by Chomsky provides a straightforward account of the rapidity of the child’s grammatical development, since it posits that there are a universal set of innately endowed grammatical principles which determine how grammatical operations apply in natural language grammars. Since UG principles which are innately endowed are wired into the language faculty and so do not have to be learned by the child, this minimises the learning load placed on the child, and thereby maximises the learnability of natural language grammars.
1.6 Parameters

Thus far, we have argued that the language faculty incorporates a set of universal principles which guide the child in acquiring a grammar. However, it clearly cannot be the case that all aspects of the grammar of languages are universal; if this were so, all natural languages would have the same grammar and there would be no grammatical learning involved in language acquisition (i.e. no need for children to learn anything about the grammar of sentences in the language they are acquiring), only lexical learning (viz. learning the lexical items/words in the language and their idiosyncratic linguistic properties, e.g. whether a given item has an irregular plural or past tense form). But although there are universal principles which determine the broad outlines of the grammar of natural languages, there also seem to be language-particular aspects of grammar which children have to learn as part of the task of acquiring their native language. Thus, language acquisition involves not only lexical learning but also some grammatical learning. Let’s take a closer look at the grammatical learning involved, and what it tells us about the language acquisition process.

Clearly, grammatical learning is not going to involve learning those aspects of grammar which are determined by universal (hence innate) grammatical operations and principles. Rather, grammatical learning will be limited to those parameters (i.e. dimensions or aspects) of grammar which are subject to language-particular variation (and hence vary from one language to another). In other words, grammatical learning will be limited to parametrised aspects of grammar (i.e. those aspects of grammar which are subject to parametric variation from one language to another). The obvious way to determine just what aspects of the grammar of their native language children have to learn is to examine the range of parametric variation found in the grammars of different (adult) natural languages.

We can illustrate one type of parametric variation across languages in terms of the following contrast between the Italian examples in (22a-b) below, and their English counterparts in (22c-d):

(22)(a) Maria parla francese  (b) Parla francese  
(c) Maria speaks French  (d) *Speaks French

As (22a) and (22c) illustrate, the Italian verb *parlare* and its English counterpart *speak* (as used here) are two-place predicates which require both a subject argument like *Maria* and an object argument like *francese/French*: in both cases, the verb is finite (more specifically it is a present tense form) and agrees with its subject *Maria* (and hence is a third person singular form). But what are we to make of Italian sentences like (22b) *Parla francese* (= ‘Speaks French’) in which the verb *parla* ‘speaks’ has the overt complement *francese* ‘French’ but has no overt subject? The answer suggested in work over the past few decades is that the verb in such cases has a null subject which can be thought of as a silent or invisible counterpart of the pronouns *he/she* which appear in the corresponding English translation ‘He/She speaks French’. This null subject is conventionally designated as *pro*, so that (22b) has the structure *pro parla francese* ‘pro speaks French’, where *pro* is a null subject pronoun.

There are two reasons for thinking that the verb *parla* ‘speaks’ has a ‘silent’ null pronoun as its subject in (22b). Firstly, *parlare ‘speak’* (in the relevant use) is a two-place predicate which requires both a subject argument and an object argument: under the null subject analysis, its subject argument is *pro* (a null pronoun). Secondly, finite verbs agree with their subjects in Italian: hence, in order to account for the fact that the verb *parla* is in the third person singular form in (22b), we need to posit that it has a third person singular subject; under the null subject analysis, we can say that *parla ‘speaks’* has a null pronoun (*pro*) as its subject, and that *pro* (if used to refer to *Maria*) is a third person feminine singular pronoun.

The more general conclusion to be drawn from our discussion is that in languages like Italian, finite verbs (i.e. verbs which carry present/past etc. tense) can have either an overt subject like *Maria* or a null *pro* subject. But things are very different in English. Although a finite verb like *speaks* can have an overt subject like *Maria* in English, it cannot normally have a null *pro* subject – hence the ungrammaticality of (22d) *Speaks French*. So, finite verbs in a language like Italian can have either overt or null subjects, but in a language like English, finite verbs can generally have only overt subjects, not null subjects. We can describe the differences between the two types of language by saying that Italian is a null subject language, whereas English is a non-null subject language. More generally, there appears to be parametric variation between languages as to whether or not they allow finite verbs to have null subjects. The relevant parameter (termed the Null Subject Parameter) would appear to be a binary one, with only two possible settings for any given language L, viz. *L either does or doesn’t allow any finite verb to have a null subject*. There appears to be no language which allows the subjects of some finite verbs to be null,
but not others – e.g. no language in which it is OK to say *Drinks wine* (meaning ‘He/she drinks wine’) but not OK to say *Eats pasta* (meaning ‘He/she eats pasta’). The range of grammatical variation found across languages appears to be strictly limited to just two possibilities – languages either do or don’t systematically allow finite verbs to have null subjects. (A complication glossed over here is posed by languages in which only some finite verb forms can have null subjects: see Vainikka and Levy 1999 and the collection of papers in Jaeggli and Safir 1989 for illustration and discussion.)

A more familiar aspect of grammar which appears to be parametrised relates to word order, in that different types of language have different word orders in specific types of construction. One type of word order variation can be illustrated in relation to the following contrast between English and Chinese questions:

(23)(a) What do you believe he will say?
(b) *Ni xiangxin ta hui shuo shenme*

You believe he will say what?

In simple wh-questions in English (i.e. questions containing a single word beginning with *wh*- like *what/where/when/why*) the wh-expression is moved to the beginning of the sentence, as is the case with *what* in (23a). By contrast, in Chinese, the wh-word does not move to the front of the sentence, but rather remains *in situ* (i.e. in the same place as would be occupied by a corresponding non-interrogative expression), so that *shenme* ‘what’ is positioned after the verb *shuo* ‘say’ because it is the (direct object) complement of the verb, and complements of the relevant type are normally positioned after their verbs in Chinese. Thus, another parameter of variation between languages is the *wh-parameter* – a parameter which determines whether wh-expressions can be fronted (i.e. moved to the front of the overall interrogative structure containing them) or not. Significantly, this parameter again appears to be one which is binary in nature, in that it allows for only two possibilities – viz. a language either does or doesn’t allow *wh-movement* (i.e. movement of wh-expressions to the front of the sentence). Many other possibilities for wh-movement just don’t seem to occur in natural language: for example, there is no language in which the counterpart of *who* undergoes wh-fronting but not the counterpart of *what* (e.g. no language in which it is OK to say *Who did you see?* but not *What did you see?*). Likewise, there is no language in which wh-complements of some verbs can undergo fronting, but not wh-complements of other verbs (e.g. no language in which it is OK to say *What did he drink?* but not *What did he eat?*). It would seem that the range of parametric variation found with respect to wh-fronting is limited to just two possibilities: viz. a language either does or doesn’t allow wh-expressions to be systematically fronted. (However, it should be noted that a number of complications are overlooked here in the interest of simplifying exposition: e.g. some languages like English allow only one wh-expression to be fronted in this way, whereas others allow more than one wh-expression to be fronted; see Bošković 2002a for a recent account. An additional complication is posed by the fact that wh-movement appears to be optional in some languages, either in main clauses, or in main and complement clauses alike: see Denham 2000, and Cheng and Rooryck 2000.)

Let’s now turn to look at a rather different type of word-order variation, concerning the relative position of *heads* and *complements* within phrases. It is a general (indeed, universal) property of phrases that every phrase has a head word which determines the nature of the overall phrase. For example, an expression such as *students of Philosophy* is a plural noun phrase because its head word (i.e. the key word in the phrase whose nature determines the properties of the overall phrase) is the plural noun *students*: the noun *students* (and not the noun *Philosophy*) is the head word because the phrase *students of Philosophy* denotes kinds of student, not kinds of Philosophy. The following expression of *Philosophy* which combines with the head noun *students* to form the noun phrase *students of Philosophy* functions as the *complement* of the noun *students*. In much the same way, an expression such as *in the kitchen* is a prepositional phrase which comprises the head preposition *in* and its complement *the kitchen*. Likewise, an expression such as *stay with me* is a verb phrase which comprises the head verb *stay* and its complement *with me*. And similarly, an expression such as *fond of fast food* is an adjectival phrase formed by combining the head adjective *fond* with its complement *of fast food*.

In English all heads (whether nouns, verbs, prepositions, or adjectives etc.) normally precede their complements; however, there are also languages like Korean in which all heads normally follow their complements. In informal terms, we can say that English is a *head-first language*, whereas Korean is a *head-last language*. The differences between the two languages can be illustrated by comparing the English examples in (24) below with their Korean counterparts in (25):
In the English verb phrase close the door in (24a), the head verb close precedes its complement the door; if we suppose that the door is a determiner phrase, then the head of the phrase (= the noun door). Likewise, in the English noun phrase desire for change in (24b), the head noun desire precedes its complement for change; the complement for change is in turn a prepositional phrase in which the head preposition for likewise precedes its complement change. Since English consistently positions heads before complements, it is a head-first language. By contrast, we find precisely the opposite ordering in Korean. In the verb phrase muneul dadara (literally ‘door close’) in (25a), the head verb dadara ‘close’ follows its complement muneul ‘door’; likewise, in the noun phrase byunhwa-edaehan galmang (literally ‘change-for desire’) in (25b) the head noun galmang ‘desire’ follows its complement byunhwa-edaehan ‘change-for’; the expression byunhwa-edaehan ‘change-for’ is in turn a prepositional phrase whose head preposition edaehan ‘for/about’ follows its complement byunhwa ‘change’ (so that edaehan might more appropriately be called a postposition; prepositions and postpositions are different kinds of adposition). Since Korean consistently positions heads after their complements, it is a head-last language. Given that English is head-first and Korean head-last, it is clear that the relative positioning of heads with respect to their complements is one word-order parameter along which languages differ; the relevant parameter is termed the Head Position Parameter.

It should be noted, however, that word-order variation in respect of the relative positioning of heads and complements falls within narrowly circumscribed limits. There are many logically possible types of word order variation which just don’t seem to occur in natural languages. For example, we might imagine that in a given language some verbs would precede and others follow their complements, so that (e.g.) if two new hypothetical verbs like scrunge and plurg were coined in English, then scrunge might take a following complement, and plurg a preceding complement. And yet, this doesn’t ever seem to happen: rather all verbs typically occupy the same position in a given language with respect to a given type of complement. (A complication overlooked here in the interest of expository simplicity is that some languages position some types of head before their complements, and other types of head after their complements: German is one such language, as you will see from exercise 1.2.)

What this suggests is that there are universal constraints (i.e. restrictions) on the range of parametric variation found across languages in respect of the relative ordering of heads and complements. It would seem as if there are only two different possibilities which the theory of Universal Grammar allows for: a given type of structure in a given language must either be head-first (with the relevant heads positioned before their complements), or head-last (with the relevant heads positioned after their complements). Many other logically possible orderings of heads with respect to complements appear not to be found in natural language grammars. The obvious question to ask is why this should be. The answer given by the theory of parameters is that the language faculty imposes genetic constraints on the range of parametric variation permitted in natural language grammars. In the case of the Head Position Parameter (i.e. the parameter which determines the relative positioning of heads with respect to their complements), the language faculty allows only a binary set of possibilities – namely that a given kind of structure in a given language is either consistently head-first or consistently head-last.

We can generalise our discussion in this section in the following terms. If the Head Position Parameter reduces to a simple binary choice, and if the Wh-Parameter and the Null Subject Parameter also involve binary choices, it seems implausible that bинarity could be an accidental property of these particular parameters. Rather, it seems much more likely that it is an inherent property of parameters that they constrain the range of structural variation between languages, and limit it to a simple binary choice. Generalising still further, it seems possible that all grammatical variation between languages can be characterised in terms of a set of parameters, and that for each parameter, the language faculty specifies a binary choice of possible values for the parameter. (For a critique of the idea that cross-linguistic variation is reducible to a small number of structural parameters, see Abeillé and Borsley 2006, and Newmeyer 2004, 2006; for a defense of parameters, see Roberts and Holmberg 2006.)

| (24)(a) | Close the door | (b) desire for change |
| (25)(a) | Muneul dadara | (b) byunhwa-edaehan galmang |

Door close change-for desire

(25a) Muneul dadara | byunhwa-edaehan galmang
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1.7 Parameter setting

The theory of parameters outlined in the previous section has important implications for a theory of language acquisition. If all grammatical variation can be characterised in terms of a series of parameters with binary settings, it follows that the only grammatical learning which children have to undertake in relation to the syntactic properties of the relevant class of constructions is to determine (on the basis of their linguistic experience) which of the two alternative settings for each parameter is the appropriate one for the language being acquired. So, for example, children have to learn whether the native language they are acquiring is a null subject language or not, whether it is a wh-movement language or not, and whether it is a head-first language or not...and so on for all the other parameters along which languages vary. Of course, children also face the formidable task of lexical learning – i.e. building up their vocabulary in the relevant language, learning what words mean and what range of forms they have (e.g. whether they are regular or irregular in respect of their morphology), what kinds of structures they can be used in and so on. On this view, the acquisition of grammar involves the twin tasks of lexical learning and structural learning (with the latter involving parameter-setting).

This leads us to the following view of the language acquisition process. The central task which the child faces in acquiring a language is to construct a grammar of the language. The innate Language Faculty incorporates (i) a set of universal grammatical principles, and (ii) a set of grammatical parameters which impose severe constraints on the range of grammatical variation permitted in natural languages (perhaps limiting variation to binary choices). Since universal principles don’t have to be learned, the child’s syntactic learning task is limited to that of parameter-setting (i.e. determining an appropriate setting for each of the relevant grammatical parameters). For obvious reasons, the theory outlined here (developed by Chomsky at the beginning of the 1980s and articulated in Chomsky 1981) is known as Principles-and-Parameters Theory/PPT.

The PPT model clearly has important implications for the nature of the language acquisition process, since it vastly reduces the complexity of the acquisition task which children face. PPT hypothesises that grammatical properties which are universal will not have to be learned by the child, since they are wired into the language faculty and hence part of the child’s genetic endowment: on the contrary, all the child has to learn are those grammatical properties which are subject to parametric variation across languages. Moreover, the child’s learning task will be further simplified if it turns out (as research since 1980 has suggested) that the values which a parameter can have fall within a narrowly specified range, perhaps characterisable in terms of a series of binary choices. This simplified parameter-setting model of the acquisition of grammar has given rise to a metaphorical acquisition model in which the child is visualised as having to set a series of switches in one of two positions (up/down) – each such switch representing a different parameter. In the case of the Head Position Parameter, we can imagine that if the switch is set in the up position (for particular types of head), the language will show head-first word order in relevant kinds of structure, whereas if it is set in the down position, the order will be head-last. Of course, an obvious implication of the switch metaphor is that the switch must be set in either one position or the other, and cannot be set in both positions. (This would preclude e.g. the possibility of a language having both head-first and head-last word order in a given type of structure.)

The assumption that acquiring the grammar of a language involves the relatively simple task of setting a number of grammatical parameters provides a natural way of accounting for the fact that the acquisition of specific parameters appears to be a remarkably rapid and error-free process in young children (Wexler 1998). For example, young children acquiring English as their native language seem to set the Head Position Parameter at its appropriate head-first setting from the very earliest multiword utterances they produce (at around 18 months of age), and seem to know (tacitly, not explicitly, of course) that English is a head-first language. Accordingly, the earliest verb phrases and prepositional phrases produced by young children acquiring English consistently show verbs and prepositions positioned before their complements, as structures such as the following indicate (produced by a young boy called Jem/James at age 20 months; head verbs are italicised in (26a) and head prepositions in (26b), and their complements are in non-italic print):


The obvious conclusion to be drawn from structures like (26) is that children like Jem consistently position heads before their complements from the very earliest multiword utterances they produce. They do not use different orders for different words of the same type (e.g. they don’t position the verb see after its complement but the verb want before its complement), or for different types of words (e.g. they don’t position verbs before and prepositions after their complements).

A natural question to ask at this point is how we can provide a principled explanation for the fact that from the very onset of multiword speech we find English children correctly positioning heads before their complements. The Principles-and-Parameters model enables us to provide an explanation for why children manage to learn the relative ordering of heads and complements in such a rapid and error-free fashion. The answer provided by the model is that learning this aspect of word order involves the comparatively simple task of setting a binary parameter at its appropriate value. This task will be a relatively straightforward one if the language faculty tells the child that the only possible choice is for a given type of structure in a given language to be uniformly head-first or uniformly head-last. Given such an assumption, the child could set the parameter correctly on the basis of minimal linguistic experience. For example, once the child is able to analyse the structure of an adult utterance such as Help Daddy and knows that it contains a verb phrase comprising the head verb help and its complement Daddy, then (on the assumption that the language faculty specifies that all heads of a given type behave uniformly with regard to whether they are positioned before or after their complements), the child will automatically know that all verbs in English are canonically (i.e. normally) positioned before their complements.

One of the questions posed by the parameter-setting model of acquisition outlined here is just how children come to arrive at the appropriate setting for a given parameter, and what kind(s) of evidence they make use of in setting parameters. As Chomsky notes (1981, pp. 8-9), there are two types of evidence which we might expect to be available to the language learner in principle, namely positive evidence and negative evidence. Positive evidence comprises a set of observed expressions illustrating a particular phenomenon: for example, if children’s speech input is made up of structures in which heads precede their complements, this provides them with positive evidence which enables them to set the Head Position Parameter appropriately. Negative evidence might be of two kinds – direct or indirect. Direct negative evidence could come from the correction of children’s errors by other speakers of the language. However, (contrary to what is often imagined) correction plays a fairly insignificant role in language acquisition, for two reasons. Firstly, correction is relatively infrequent: adults simply don’t correct all the errors children make (if they did, children would soon become inhibited and discouraged from speaking). Secondly, children are notoriously unresponsive to correction, as the following dialogue (from McNeill 1966, p. 69) illustrates:

(27) CHILD: Nobody don’t like me
ADULT: No, say: ‘Nobody likes me’
CHILD: Nobody don’t like me
(8 repetitions of this dialogue)
ADULT: No, now listen carefully. Say ‘Nobody likes me’
CHILD: Oh, nobody don’t likes me


Direct negative evidence might also take the form of self-correction by other speakers. Such self-corrections tend to have a characteristic intonation and rhythm of their own, and may be signalled by a variety of fillers (such as those italicised in (28) below):

(28)(a) The picture was hanged...or rather hung...in the Tate Gallery
(b) The picture was hanged...sorry hung...in the Tate Gallery
(c) The picture was hanged...I mean hung...in the Tate Gallery

However, self-correction is arguably too infrequent a phenomenon to play a major role in the acquisition process.

Rather than say that children rely on direct negative evidence, we might instead imagine that they learn from indirect negative evidence (i.e. evidence relating to the non-occurrence of certain types of
structure). Suppose that a child’s experience includes no examples of structures in which heads follow their complements (e.g. no prepositional phrases like *dinner after in which the head preposition after follows its complement dinner, and no verb phrases such as *cake eat in which the head verb eat follows its complement cake). On the basis of such indirect negative evidence (i.e. observing that such structures never occur in English), the child might infer that English is not a head-last language.

Although it might seem natural to suppose that indirect negative evidence plays some role in the acquisition process, there are potential learnability problems posed by any such claim. After all, the fact that a given construction does not occur in a given chunk of the child’s experience does not provide conclusive evidence that the structure is ungrammatical, since it may well be that the non-occurrence of the relevant structure in the relevant chunk of experience is an accidental (rather than a systematic) gap. Thus, the child would need to process a very large (in principle, infinite) chunk of experience in order to be sure that non-occurrence reflects ungrammaticality. It seems implausible to suppose that children process massive chunks of experience in this way and search through it for negative evidence about the non-occurrence of certain types of structure. In any case, given the assumption that parameters are binary and single-valued, negative evidence becomes entirely unnecessary: after all, once the child hears a prepositional phrase like with Daddy in which the head preposition with precedes its complement Daddy, the child will have positive evidence that English allows head-first order in prepositional phrases; and given the assumption that the Head Position Parameter is a binary one and the further assumption that each parameter allows only a single setting, then it follows (as a matter of logical necessity) that if English allows head-first prepositional phrases, it will not allow head-last prepositional phrases. Thus, in order for the child to know that English doesn’t allow head-last prepositional phrases, the child does not need negative evidence from the non-occurrence of such structures, but rather can rely on positive evidence from the occurrence of the converse order in head-first structures (on the assumption that if a given structure is head-first, UG specifies that it cannot be head-last). And, as we have already noted, a minimal amount of positive evidence is required in order to identify English as a uniformly head-first language (i.e. a language in which all heads precede their complements). Learnability considerations such as these have led Chomsky (1986a, p.55) to conclude that ‘There is good reason to believe that children learn language from positive evidence only.’ The claim that children do not make use of negative evidence in setting parameters is known as the No-Negative-Evidence Hypothesis; it is a hypothesis which is widely assumed in current acquisition research. (See Guasti 2002 for a technical account of language acquisition within the framework used here.)

1.8 Summary

We began this chapter in §1.2 with a brief look at traditional grammar, noting that this is a taxonomic (i.e. classificatory) system in which the syntax of a given sentence is described by assigning each of the constituents in the sentence to a grammatical category, and saying what grammatical function it has. In §1.3, we noted that Chomsky takes a very different cognitive approach to the study of language in which a grammar of a language is a model of the grammatical knowledge (or competence) internalised in the mind/brain of a native speaker (hence a model of the speaker’s I-language). We saw that Chomsky’s ultimate goal is to develop a theory of Universal Grammar/UG which characterises the defining properties of the grammars of natural languages – a theory which is universal, explanatory and constrained, and which provides descriptively adequate grammars that are minimally complex and hence learnable. In §1.4, we went on to look at the nature of language acquisition, and argued that the most fundamental question for a theory of language acquisition to answer is why it should be that after a period of a year and a half during which there is little evidence of grammatical development visible in the child’s speech output, most of the grammar of the language is acquired by children during the course of the following year. We outlined the innateness hypothesis put forward by Chomsky, under which the course of language acquisition is genetically predetermined by an innate language faculty. In §1.5, we noted Chomsky’s claim that the language faculty incorporates a theory of Universal Grammar/UG which embodies a set of universal grammatical principles that determine the ways in which grammatical operations work; and we saw that the syntax of questions in English provides evidence for postulating that syntactic operations are constrained by a Locality Principle. In §1.6, we went on to argue that the grammars of natural languages vary along a number of parameters. We looked at three such parameters – the Wh-Parameter, the Null Subject Parameter, and the Head Position Parameter, arguing that each
of these parameters is binary in nature by virtue of having two alternative settings. In §1.7, we argued that the syntactic learning task which children face involves parameter-setting – i.e. determining which of two possible settings is the appropriate one for each parameter in the language being acquired. We further argued that if parameters have binary settings (e.g. so that a given kind of structure in a given language is either head-first or head-last), we should expect to find evidence that children correctly set parameters from the very onset of multiword speech: and we presented evidence to suggest that from their very earliest multiword utterances, children acquiring English as their mother tongue correctly set the Head Position Parameter at the head-first value appropriate for English. We concluded that the acquisition of grammar involves the twin tasks of lexical learning (i.e. acquiring a lexicon/vocabulary) and parameter-setting. We went on to ask what kind of evidence children use in setting parameters, and concluded that they use positive evidence from their experience of the occurrence of specific types of structure (e.g. head-first structures, or null-subject structures, or wh-movement structures).

WORKBOOK SECTION

Exercise 1.1
Below are examples of utterances produced by a girl called Lucy at age 24 months. Comment on whether Lucy has correctly set the three parameters discussed in the text (the Head Position Parameter, the Wh-Parameter, and the Null Subject Parameter). Discuss the significance of the relevant examples for the parameter-setting model of acquisition.

<table>
<thead>
<tr>
<th>CHILD SENTENCE</th>
<th>ADULT COUNTERPART</th>
</tr>
</thead>
<tbody>
<tr>
<td>1    What doing?</td>
<td>‘What are you doing?’</td>
</tr>
<tr>
<td>2    Want bye-byes</td>
<td>‘I want to go to sleep’</td>
</tr>
<tr>
<td>3    Mummy go shops</td>
<td>‘Mummy went to the shops’; this was in reply to ‘Where did Mummy go?’</td>
</tr>
<tr>
<td>4    Me have yoghurt?</td>
<td>‘Can I have a yoghurt?’</td>
</tr>
<tr>
<td>5    Daddy doing?</td>
<td>‘What’s Daddy doing?’</td>
</tr>
<tr>
<td>6    Think Teddy sleeping</td>
<td>‘I think Teddy’s sleeping’; this was in reply to ‘What d’you think Teddy's doing?’</td>
</tr>
<tr>
<td>7    What me having?</td>
<td>‘What am I having?’; this followed her mother saying ‘Mummy’s having fish for dinner’</td>
</tr>
<tr>
<td>8    No me have fish</td>
<td>‘I’m not going to have fish’</td>
</tr>
<tr>
<td>9    Where Daddy gone?</td>
<td>‘Where’s Daddy gone?’</td>
</tr>
<tr>
<td>10   Gone office</td>
<td>‘He’s gone to his office’</td>
</tr>
<tr>
<td>11   Want bickies</td>
<td>‘She wants some biscuits’; this was her reply to ‘What does Dolly want?’</td>
</tr>
<tr>
<td>12   What Teddy have?</td>
<td>‘What can Teddy have?’</td>
</tr>
<tr>
<td>13   Where going?</td>
<td>‘Where are you going?’</td>
</tr>
<tr>
<td>14   Me go shops</td>
<td>‘I want to go to the shops’</td>
</tr>
<tr>
<td>15   Daddy drinking coffee</td>
<td>‘Daddy’s drinking coffee’</td>
</tr>
<tr>
<td>16   What Nana eating?</td>
<td>‘What’s Grandma eating?’</td>
</tr>
<tr>
<td>17   Want choc’ate</td>
<td>‘He wants some chocolate’; this was her reply to ‘Teddy wants some meat, does he?’</td>
</tr>
<tr>
<td>18   Dolly gone?</td>
<td>‘Where’s Dolly gone?’</td>
</tr>
<tr>
<td>19   Watch te’vision</td>
<td>‘I’m going to watch television’</td>
</tr>
<tr>
<td>20   Me have more</td>
<td>‘I want to have some more’</td>
</tr>
<tr>
<td>21   In kitchen</td>
<td>‘In the kitchen’ (reply to ‘Where’s Mummy?’)</td>
</tr>
<tr>
<td>22   Me play with Daddy</td>
<td>‘I want to play with Daddy’</td>
</tr>
<tr>
<td>23   Open door</td>
<td>‘Open the door!’</td>
</tr>
</tbody>
</table>

Helpful hints
If Lucy has correctly set the Wh-Parameter, we should expect to find that she systematically preposes wh-expressions and positions them sentence-initially. If she has correctly set the Head Position Parameter,
we should expect to find (e.g.) that she correctly positions the complement of a verb after the verb, and the complement of a preposition after the preposition; however, where the complement is a wh-expression, we expect to find that the complement is moved into sentence-initial position in order to satisfy the requirements of the Wh-Parameter (if the Wh-Parameter in some sense over-rides the Head Position Parameter). If Lucy has correctly set the Null Subject Parameter, we should expect to find that she does not use null subjects in finite clauses; however, it seems clear that many of the sentences produced by two-year old English children like Lucy do indeed have null subjects – and this led Nina Hyams in influential research (1986, 1992) to conclude that English children go through a null subject stage in which they use Italian-style null (pro) subjects in finite clauses. If Hyams is right, this implies that children may sometimes start out with incorrect settings for a given parameter, and then later have to re-set the parameter – a conclusion which (if true) would provide an obvious challenge to the simple parameter-setting model of acquisition outlined in the main text.

However, the picture relating to the use of null subjects is complicated by the fact that in addition to finite null subjects (i.e. the pro subject found in finite clauses in languages like Italian but not English), there are three other types of null subject which occur in adult English (and other languages). One is the kind of imperative null subject found in imperatives such as Shut up! and Don’t say anything!\footnote{Imperatives are sentences used to issue orders; they are the kind of sentences you can put please in front of – as in Please don’t say anything!} Another is the kind of nonfinite null subject found in a range of nonfinite clauses in English (i.e. clauses containing a verb which is not marked for tense and agreement), including main clauses like Why worry?\footnote{And complement clauses like those bracketed in I want [to go home] and I like [playing tennis]: the kind of null subject found in nonfinite clauses in English is usually designated as PRO and called ‘big PRO’ (whereas the kind of null subject found in a finite clause in a null subject language like Italian is designated as pro and called ‘little pro’. The terms big and little here simply reflect the fact that PRO is written in ‘big’ capital letters, and pro in ‘small’ lower-case letters).} The third type of null subject found in English can be called a truncated null subject, because English has a process of truncation which allows one or more words at the beginning of a sentence to be truncated (i.e. omitted) in certain types of style (e.g. diary styles of written English and informal styles of spoken English). Hence in colloquial English, a question like Are you doing anything tonight? can be reduced (by truncation) to You doing anything tonight? and further reduced (again by truncation) to Doing anything tonight? Truncation is also found in abbreviated written styles of English: for example, a diary entry might read Went to a party. Had a great time. Got totally smashed\footnote{Truncation occurs only sentence-initially (at the beginning of a sentence), but finite null (little pro) subjects in a genuine null subject language like Italian can occur in any subject position in a sentence, one way of telling the difference between a finite null subject and a truncated null subject is to see whether children omit subjects only when they are the first word in a sentence (which could be the result of truncation), or whether they also omit subjects in the middle of sentences (as is the case in a genuine null subject language like Italian). Another way of differentiating the two is that in null-subject languages like Italian with null finite pro subjects, we find that overt pronoun subjects are only used for emphasis, so that in an Italian sentence like L’ho fatto io (literally ‘I have done I’) the subject pronoun io ‘I’ has a contrastive interpretation, and the relevant sentence is paraphraseable in English as ‘I was the one who did it’ (where italics indicate contrastive stress): by contrast, in a non-null-subject language like English, subject pronouns are not intrinsically emphatic – e.g. he doesn’t necessarily have a contrastive interpretation in an English diary-style sentence such as Went to see Jim. Thought he might help). A third way of telling whether truncation is operative in Lucy’s grammar or not is to see whether expressions other than subjects can be truncated, as can happen in adult English (e.g. What time is it?) can be reduced

\textit{Since truncation occurs only sentence-initially (at the beginning of a sentence), but finite null (little pro) subjects in a genuine null subject language like Italian can occur in any subject position in a sentence, one way of telling the difference between a finite null subject and a truncated null subject is to see whether children omit subjects only when they are the first word in a sentence (which could be the result of truncation), or whether they also omit subjects in the middle of sentences (as is the case in a genuine null subject language like Italian). Another way of differentiating the two is that in null-subject languages like Italian with null finite pro subjects, we find that overt pronoun subjects are only used for emphasis, so that in an Italian sentence like L’ho fatto io (literally ‘I have done I’) the subject pronoun io ‘I’ has a contrastive interpretation, and the relevant sentence is paraphraseable in English as ‘I was the one who did it’ (where italics indicate contrastive stress): by contrast, in a non-null-subject language like English, subject pronouns are not intrinsically emphatic – e.g. he doesn’t necessarily have a contrastive interpretation in an English diary-style sentence such as Went to see Jim. Thought he might help). A third way of telling whether truncation is operative in Lucy’s grammar or not is to see whether expressions other than subjects can be truncated, as can happen in adult English (e.g. What time is it?) can be reduced

}
to *Time is it?* via truncation in rapid spoken English).

At first sight, it might seem unlikely that (some of) Lucy’s null subjects could be nonfinite (‘big PRO’) null subjects, since all the clauses she produces in the data given above occur in finite contexts (i.e. in contexts where adults would use a finite clause). Note, however, that two-year-old children typically go through a stage which Wexler (1994) calls the Optional Infinitives/OI stage at which (in finite contexts) they sometimes produce finite clauses, and sometimes nonfinite clauses (the relevant nonfinite clauses typically containing an infinitive form like go or a participle like going/gone). Hence, an additional possibility to bear in mind is that some of Lucy’s clauses may be nonfinite and have nonfinite (‘big PRO’) null subjects.

In relation to the sentences in 1-23, make the following assumptions. In 1 *doing* is a verb which has a null subject and the complement *what*; in 2 *want* is a verb which has a null subject and the complement *bye-byes*; in 3 *go* is a verb which has the subject *Mummy* and the complement *shops*; in 4 *have* is a verb which has the subject *me* and the complement *yoghurt*; in 5 *doing* is a verb which has the subject *Daddy*, and its complement is a null counterpart of *what*; in 6 *think* is a verb with a null subject and its complement *is Teddy sleeping* (with *Teddy* serving as the subject of the verb *sleeping*); in 7, *having* is a verb which has the subject *me* and the complement *what*; in 8 *no* is a negative particle which has the complement *me have fish* (assume that *no* is the kind of word which doesn’t have a subject), and *have* is a verb which has the subject *me* and the complement *fish*; in 9 *gone* is a verb which has the subject *Daddy* and the complement *where*; in 10 *gone* is a verb which has a null subject and the complement *office*; in 11 *want* is a verb which has a null subject and the complement *bickies*; in 12 *have* is a verb which has the subject *Teddy* and the complement *what*; in 13 *going* is a verb which has a null subject and the complement *where*; in 14 *go* is a verb which has the subject *me* and the complement *shops*; in 15 *drinking* is a verb which has the subject *Daddy* and the complement *coffee*; in 16 *eating* is a verb which has the subject *Nana* and the complement *what*; in 17 *want* is a verb which has a null subject and the complement *choc’ate*; in 18 *gone* is a verb which has the subject *Dolly* and its complement is a null counterpart of *where*; in 19 *watch* is a verb which has a null subject and the complement *te’vision*; in 20 *have* is a verb which has the subject *me* and the complement *more*; 21 is a prepositional phrase in which the preposition *in* has the complement *kitchen* (Assume that phrases don’t have subjects); in 22 *play* is a verb which has the subject *me* and the complement *with Daddy* (and in turn *Daddy* is the complement of the preposition *with*); and in 23 *open* is a verb whose subject is null and whose complement is *door*.

**Model answer for 1**

In *What doing?* the verb *doing* has an overt object *what* and a null subject of some kind. Since the object *what* does not occupy the normal postverbal position associated with objects in English (cf. the position of the object *something* in *Do something!*), *what* has clearly undergone wh-movement: this suggests that Lucy has correctly set the wh-parameter at the ‘requires wh-movement’ value appropriate for English. Because the object complement *what* has undergone wh-movement, we cannot tell (from this sentence) whether Lucy generally positions (unmoved) complements after their heads: in other words, this particular sentence provides us with no evidence of whether Lucy has correctly set the Head Position Parameter or not (though other examples in the exercise do). Much more difficult to answer is the question of whether Lucy has correctly set the Null Subject Parameter at the value appropriate to English, and hence (tacitly) ‘knows’ that finite clauses do not allow a null finite pro subject in English. At first sight, it might seem as if Lucy has wrongly analysed English as a null subject language (and hence mis-set the Null Subject Parameter), since *What doing?* has a null subject of some kind. But the crucial question here is: What kind of null subject does the verb *doing* have? It clearly cannot be an imperative null subject, since the sentence is interrogative in force, not imperative. Nor can it be a truncated null subject, since truncated subjects only occur in sentence-initial position (i.e. as the first word in a sentence), and *what* is the first word in the sentence in *What doing?* (since preposed wh-words occupy sentence-initial position in questions). This leaves two other possibilities. One is that the null subject in *What doing?* is the ‘little pro’ subject found in finite clauses in genuine null-subject languages like Italian: since the verb *doing* is nonfinite, this would entail positing that the sentence *What doing?* contains a null counterpart of the finite auxiliary *are* (raising questions about why the auxiliary is null rather than overt); this in turn would mean that Lucy has indeed mis-set the Null Subject Parameter (raising questions about how she comes to do so, and why she doesn’t mis-set the other two parameters we are concerned with here). However, an alternative possibility is that the structure *What doing?* is a nonfinite clause (like adult questions such as *Why worry?*) and has the kind...
of nonfinite (‘big PRO’) null subject found in nonfinite clauses in many languages (English included). If so (i.e. if What doing is a nonfinite clause which has the structure What PRO doing?), there would be no evidence that Lucy has mis-set the the Null Subject Parameter – i.e. no evidence that she ever produces finite clauses with a ‘little pro’ subject. This in turn would mean that we can maintain the hypothesis put forward in the main text that children correctly set parameters at their appropriate value from the very earliest stages of the acquisition of syntax. The error Lucy makes in producing sentences like What doing? would be in not knowing that main clauses generally have to be finite in English, and that main clause questions generally have to contain a finite auxiliary.

**Exercise 1.2**

In the text, we noted that the Head Position Parameter has a uniform head-first setting (in the sense that all heads precede their complements) in English, and a uniform head-last setting (in the sense that all heads follow their complements) in Korean. However, we also noted that there are languages in which *some* heads precede their complements (giving rise to head-first structures), and *others* follow them (giving rise to head-last structures). German is argued by some to be a language of this latter type, in which (e.g.) prepositions, determiners and complementisers canonically precede their complements, but (auxiliary and main) verbs canonically follow their complements. Discuss the extent to which German sentences like those in 1-5 below (kindly provided for me by Harald Clahsen) bear out this claim, and say which examples prove problematic and why.

1. Hans muss stolz auf seine Mutter sein
   Hans must proud of his mother be
   ‘Hans must be proud of his mother’
2. Hans muss auf seine Mutter stolz sein
   Hans must of his mother proud be
   ‘Hans must be proud of his mother’
3. Hans geht den Fluss entlang
   Hans goes the river along
   ‘Hans goes along the river’
4. Hans muss die Aufgaben lösen
   Hans must the exercises do
   ‘Hans must do the exercises’
5. Ich glaube dass Hans die Aufgaben lösen muss
   I think that Hans the exercises do must
   ‘I think that Hans must do the exercises’

Likewise, in the text we claimed that the Wh-Parameter has a uniform setting in that languages either do or don’t systematically prepose wh-expressions. Discuss the potential problems posed for this claim by colloquial French interrogative structures such as those below:

6. Où tu vas?
   Where you go?
   ‘Where are you going?’
7. Tu vas où?
   You go where?
   ‘Where are you going?’
8. Je ne sais pas où tu vas
   I not know at.all where you go
   ‘I don’t know where you are going’
9. *Je ne sais pas tu vas où
   I not know at.all you go where
   (intended as synonymous with 8)

**Helpful hints**

In relation to the German sentences in 1-5, make the following assumptions about their structure. In 1 and 2 muss is a finite (modal) verb, Hans is its subject and stolz auf seine Mutter sein is its complement; sein is an infinitive verb-form and stolz auf seine Mutter is its complement; stolz is an adjective, and auf seine Mutter is its complement; auf is a preposition and seine Mutter is its complement; seine is a determiner, and Mutter is its complement. In 3 geht is a verb, Hans is its subject and den Fluss entlang is its complement; entlang is a preposition (or, more precisely, a postposition) and den Fluss is its complement; den is a determiner and Fluss is its complement; 4 muss is a finite verb, Hans is its subject and die Aufgaben lösen is its complement; lösen is a non-finite verb in the infinitive form, and die Aufgaben is its complement; die is a determiner and Aufgaben is its complement. In 5 glaube is a finite verb, ich is its subject and dass Hans die Aufgaben lösen muss is its complement; dass is a complementiser (i.e. a complement-clause introducing particle or conjunction) and Hans die Aufgaben lösen muss is its complement; muss is a finite verb, Hans is its subject, and die Aufgaben lösen is its complement; lösen is a
non-finite verb in the infinitive form and die Aufgaben is its complement; die is a determiner and Aufgaben is its complement.

In relation to the examples in 1-5, identify all the prepositions, complementisers and determiners you can find in the sentences, and say whether (as claimed above) these precede their complements. Likewise, identify all the (auxiliary and main) verbs found in the sentences and say whether they do (or do not) follow their complements, as claimed above. Pay particular attention to heads which are exceptions to the relevant generalisations about head-position. Assume that exceptional word order can be accounted for either in lexical terms (e.g. that the lexical entry for a particular preposition may say that it does not occupy the canonical head-first position found in typical prepositional phrases), or in structural terms (in that a particular kind of head may undergo a movement operation which moves it out of its canonical position). In relation to possible structural factors which mask the underlying word order in German, bear in mind that German is traditionally claimed to be a verb-second/V2 language – i.e. a language in which a finite verb (= V) in a main clause is moved out of its canonical position into second position in the clause – e.g. into a position where it immediately follows a subject expression like Hans or ich ‘I’. In addition, comment on the problems posed by determining the canonical setting of the Head Position Parameter for adjectival phrases in German.

In relation to the French sentences in 6-9, bear in mind that Où tu vas and Tu vas où are main clauses in 6/7 and complement clauses in 8/9 (in that they serve as the complement of the verb sais ‘know’ in 8/9). Is there an asymmetry between how wh-movement works in main clauses and in complement clauses? Does this suggest that it may be too simplistic to posit a Wh-Parameter under which wh-expressions either are or aren’t systematically preposed? Why?

Model answer for 1

In 1, the determiner seine ‘his’ precedes its complement Mutter ‘mother’, and the preposition auf ‘of’ precedes its complement seine Mutter ‘his mother’, in accordance with the suggested generalisation that determiners and prepositions in German show canonical head-first order and hence are typically positioned before their complements. The adjective adjective stolz ‘proud’ also precedes its complement auf seine Mutter ‘of his mother’ in 1. By contrast, the verb sein ‘be’ follows its complement stolz auf seine Mutter ‘proud of his mother’. One possible generalisation which this might suggest is the following:

(i) In German, verbs are canonically positioned after their complements, but other heads are canonicallly positioned before their complements

However, an apparent exception to the claim made in (i) is posed by the fact that the finite verb muss ‘must’ in the main clause precedes its own complement stolz auf seine Mutter sein ‘proud of his mother be’. This apparently exceptional word order is arguably attributable to the status of German as a so-called verb-second language – i.e. a language which has a verb-fronting operation which moves a finite verb in a main clause out of the canonical clause-final position occupied by verbs (including by the verb muss in 5) into second position within the clause: as a result of this movement operation, the verb muss comes to follow the main clause subject Hans. (For a discussion of the structure of verb-second clauses in German, see Radford et al 1999, pp.349-354 – though some of the material there may not be clear to you until you have read the first 6 chapters in this book.)
2

Structure

2.1 Overview
In this chapter, we introduce the notion of syntactic structure, looking at how words are combined together to form phrases and sentences. We shall see that phrases and sentences are built up by a series of merger operations, each of which combines a pair of constituents together to form a larger constituent. We show how the resulting structure can be represented in terms of a tree diagram. We look at some of the principles which underlie sentence formation, and we explore ways of testing the structure of phrases and sentences.

2.2 Phrases
To put our discussion on a concrete footing, let’s consider how an elementary two-word phrase such as that produced by speaker B in the following mini-dialogue is formed:

(1) SPEAKER A: What are you trying to do? SPEAKER B: Help you

As speaker B’s utterance illustrates, the simplest way of forming a phrase is by merging (a technical term meaning ‘combining’) two words together: for example, by merging the word help with the word you in (1), we form the phrase help you. The resulting phrase help you seems to have verb-like rather than noun-like properties, as we see from the fact that it can occupy the same range of positions as the simple verb help, and hence e.g. occur after the infinitive particle to: cf.

(2)(a) We are trying to help (b) We are trying to help you

By contrast, the phrase help you cannot occupy the kind of position occupied by a pronoun such as you, as we see from (3) below:

(3)(a) You are very difficult (b) *Help you are very difficult

So, it seems clear that the grammatical properties of a phrase like help you are determined by the verb help, and not by the pronoun you. Much the same can be said about the semantic properties of the expression, since the phrase help you describes an act of help, not a kind of person. Using the appropriate technical terminology, we can say that the verb help is the head of the phrase help you, and hence that help you is a verb phrase: and in the same way as we abbreviate category labels like verb to V, so too we can abbreviate the category label verb phrase to VP. If we use the traditional labelled bracketing technique to represent the category of the overall verb phrase help you and of its constituent words (the verb help and the pronoun you), we can represent the structure of the resulting phrase as in (4) below:

(4) [VP [V help] [PRN you]]

An alternative (equivalent) way of representing the structure of phrases like help you is via a labelled tree diagram such as (5) below (which is a bit like a family tree diagram – albeit for a small family):

(5)

```
  VP
     V  PRN
      help  you
```

What the tree diagram in (5) tells us is that the overall phrase help you is a verb phrase (VP), and that its two constituents are the verb (V) help and the pronoun (PRN) you. The verb help is the head of the overall phrase (and so is the key word which determines the grammatical and semantic properties of the phrase help you). Introducing another technical term at this point, we can say that conversely, the VP help you is a projection of the verb help, in the sense that the verb help is projected into a larger structure by merging it with another constituent of an appropriate kind. In this case, the constituent which is merged with the verb help is the pronoun you, which has the grammatical function of being the (direct object)
complement of the verb help. The head of a projection/phrase determines grammatical properties of its complement: in this case, since help is a transitive verb, it requires a complement with accusative case (e.g. a pronoun like me/us/him/them), and this requirement is satisfied here since you can function as an accusative form (as you can see from the table of pronouns listed under the entry for Case in the Glossary of terms at the end of the book). The tree diagram in (5) is entirely equivalent to the labelled bracketing in (4), in the sense that the two provide us with precisely the same information about the structure of the phrase help you. The differences between a labelled bracketing like (4) and a tree diagram like (5) are purely notational: each category is represented by a single labelled node in a tree diagram (i.e. by a point in the tree which carries a category label like VP, V or PRN), but by a pair of labelled brackets in a labelled bracketing.

Since our goal in developing a theory of Universal Grammar is to uncover general structural principles governing the formation of phrases and sentences, let’s generalise our discussion of (5) at this point and hypothesise that all phrases are formed in essentially the same way as the phrase in (5), namely by a binary (i.e. pairwise) merger operation which combines two constituents together to form a larger constituent. In the case of (5), the resulting phrase help you is formed by merging two words. However, not all phrases contain only two words – as we see if we look at the structure of the phrase produced by speaker B in (6) below:

(6) SPEAKER A: What was your intention? SPEAKER B: To help you

The phrase in (6b) is formed by merging the infinitive particle to with the verb phrase help you. What’s the head of the resulting phrase to help you? A reasonable guess would be that the head is the infinitival tense particle T to, so that the resulting expression to help you is an infinitival TP (= infinitival tense projection = infinitival tense phrase). This being so, we’d expect to find that TPs containing infinitival to have a different distribution (and so occur in a different range of positions) from VPs/verb phrases – and this is indeed the case, as we see from the contrast below:

(7) (a) They ought to help you (= ought + TP to help you)
    (b) *They ought help you (= ought + VP help you)

(8) (a) They should help you (= should + VP help you)
    (b) *They should to help you (= should + TP to help you)

If we assume that help you is a VP whereas to help you is a TP, we can account for the contrasts in (7) and (8) by saying that ought is the kind of word which selects (i.e. ‘takes’) an infinitival TP as its complement, whereas should is the kind of word which selects an infinitival VP as its complement. Implicit in this claim is the assumption that different words like ought and should have different selectional properties which determine the range of complements they permit.

The infinitive phrase to help you is formed by merging the infinitive particle to with the verb phrase help you. If (as we argued in the previous chapter) infinitival to is an infinitival tense particle (belonging to the category T) and if to is the head of the phrase to help you, the structure formed by merging to with the verb phrase/VP help you in (5) will be the TP (i.e. infinitival Tense Projection/Tense Phrase) in (9) below:

(9)

     TP
    /  \
   T   VP
   /    \
  V     PRN
   \     \  
      help you

The head of the resulting infinitival tense projection to help you is the infinitival particle to, and the verb phrase help you is the complement of to; conversely, to help you is a projection of to. In keeping with our earlier observation that ‘The head of a projection/phrase determines grammatical properties of its complement’, the infinitival tense particle to requires an infinitival verb phrase as its complement: more specifically, to requires the head V of its VP complement to be a verb in its infinitive form, so that we require the (bare/uninflected) infinitive form help after infinitival to (and not an inflected form like helping/helped/helps). Refining our earlier observation somewhat, we can therefore say that ‘The head of
a projection/phrase determines grammatical properties of the head word of its complement’. In (9), to is the head of the TP to help you, and the complement of to is the VP help you; the head of this VP is the V help, so that to determines the form of the V help (requiring it to be in the infinitive form help).

More generally, our discussion here suggests that we can build up phrases by a series of binary merger operations which combine successive pairs of constituents to form ever larger structures. For example, by merging the infinitive phrase to help you with the verb trying, we can form the even larger phrase trying to help you produced by speaker B in (10) below:

(10)  

SPEAKER A: What are you doing?  
SPEAKER B: Trying to help you

The resulting phrase trying to help you is headed by the verb trying, as we see from the fact that it can be used after words like be, start or keep which select a complement headed by a verb in the -ing form (cf. They were/started/kept trying to help you). This being so, the italicised phrase produced by speaker B in (10) is a VP (= verb phrase) which has the structure (11) below:

(11)                         VP
V                      TP
trying              to
TP
VP
V             PRN
help            you

(11) tells us (amongst other things) that the overall expression trying to help you is a verb phrase/VP; its head is the verb/V trying, and the complement of trying is the TP/infinitival tense phrase to help you: conversely, the VP trying to help you is a projection of the V trying. An interesting property of syntactic structures which is illustrated in (11) is that of recursion – that is, the property of allowing a given structure to contain more than one instance of a given category (in this case, more than one verb phrase/VP – one headed by the verb help and the other headed by the verb trying).

Since our goal in developing a theory of Universal Grammar/UG is to attempt to establish universal principles governing the nature of linguistic structure, an important question to ask is whether there are any general principles of constituent structure which we can abstract from structures like (5, 9, 11). If we look closely at the relevant structures, we can see that they obey the following two (putatively universal) constituent structure principles:

(12)  

Headdness Principle  
Every syntactic structure is a projection of a head word

(13)  

Binarity Principle  
Every syntactic structure is binary-branching

(The term syntactic structure is used here as an informal way of denoting an expression which contains two or more constituents.) For example, the structure (11) obeys the Headedness Principle (12) in that the VP help you is headed by the V help, the TP to help you is headed by the T to, and the VP trying to help you is headed by the V trying. Likewise, (11) obeys the Binarity Principle (13) in that the VP help you branches into two immediate constituents (in the sense that it has two constituents immediately beneath it, namely the V help and the PRN you), the TP to help you branches into two immediate constituents (the non-finite tense particle T to and the VP help you), and the VP trying to help you likewise branches into two immediate constituents (the V trying and the TP to help you). Our discussion thus leads us towards a principled account of constituent structure – i.e. one based on a set of principles of Universal Grammar.

There are several reasons for trying to uncover constituent structure principles like (12) and (13). From a learnability perspective, such principles reduce the range of alternatives which children have to choose between when trying to determine the structure of a given kind of expression: they therefore help us develop a more constrained theory of syntax. Moreover, additional support for the Binarity Principle comes from evidence that phonological structure is also binary, in that (e.g.) a syllable like bat has a binary structure, consisting of the onset [b] and the rhyme [at], and the rhyme in turn has a binary structure, consisting of the nucleus [a] and the coda [t] (See Radford et al. 1999, pp. 88ff. for an outline of
syllable structure). Likewise, there is evidence that morphological structure is also binary: e.g. (under the analysis proposed in Radford et al 1999, p.164) the noun indecipherability is formed by adding the prefix de- to the noun cipher to form the verb decipher; then adding the suffix -able to this verb to form the adjective decipherable; and then adding the prefix in- to this adjective to form the adjective indecipherable. It would therefore seem that binarity is an inherent characteristic of the phonological, morphological and syntactic structure of natural languages. There is also a considerable body of empirical evidence in support of a binary-branching analysis of a range of syntactic structures in a range of languages (e.g. in Kayne 1984) – though this work is highly technical and it would not be appropriate to consider it here.

2.3 Clauses

Having considered how phrases are formed, let’s now turn to look at how clauses and sentences are formed. By way of illustration, suppose that speaker B had used the simple (single-clause) sentence italicised in (14) below to reply to speaker A, rather than the phrase used by speaker B in (10):

(14)  SPEAKER A: What are you doing?  SPEAKER B: We are trying to help you

What’s the structure of the italicised clause produced by speaker B in (14)?

In work in the 1960s, clauses were generally taken to belong to the category S (Sentence/Clause), and the sentence produced by B in (14) would have been taken to have a structure along the following lines:

(S

PRN

We

T

are

try

V

are trying to help

V

to

T

help

TP

you

VP

)

However, a structure such as (15) violates the two constituent structure principles which we posited in (12) and (13) above. More particularly, the S analysis of clauses in (15) violates the Headedness Principle (12) in that the S we are trying to help you is a structure which has no head of any kind.

Likewise, the S analysis in (15) also violates the Binarity Principle (13) in that the S constituent We are trying to help you is not binary-branching but rather ternary-branching, because it branches into three immediate constituents, namely the PRN we, the T are, and the VP trying to help you. If our theory of Universal Grammar requires every syntactic structure to be a binary-branching projection of a head word, it is clear that we have to reject the S-analysis of clause structure in (15) as one which is not in keeping with UG principles.

Let’s therefore explore an alternative analysis of the structure of clauses which is consistent with the headedness and binarity requirements in (12) and (13). More specifically, let’s make the unifying assumption that clauses are formed by the same binary merger operation as phrases, and accordingly suppose that the italicised clause in (14) is formed by merging the (present) tense auxiliary are with the verb phrase trying to help you, and then subsequently merging the resulting expression are trying to help you with the pronoun we. Since are belongs to the category T of tense auxiliary, it might at first sight seem as if merging are with the verb phrase trying to help you will derive (i.e. form) the tense projection/tense phrase/TP are trying to help you. But this can’t be right, since it would provide us with no obvious account of why speaker B’s reply in (16) below is ungrammatical:

(16)  SPEAKER A: What are you doing?  SPEAKER B: *Are trying to help you

If are trying to help you is a complete TP, how come it can’t be used to answer A’s question in (16), since we see from sentences like (6B) that TP constituents like to help you can be used to answer questions.

An informal answer we can give is to say that the expression are trying to help you is somehow ‘incomplete’, and that only ‘complete’ expressions can be used to answer questions. In what sense is Are
trying to help you incomplete? The answer is that finite (e.g. present/past tense) T constituents require a subject, and the finite auxiliary are doesn’t have a subject in (16). More specifically, let’s assume that when we merge a tense auxiliary (= T) with a verb phrase (= VP), we form an intermediate projection which we shall here denote as T’ (pronounced ‘tee-bar’); and that only when we merge the relevant T-bar constituent with a subject like we do we form a maximal projection – or, more informally a ‘complete TP’. Given these assumptions, the italicised clause in (14b) will have the structure (17) below:

(17)  

TP  
PRN  
We  
T  
are  
V  
trying  
T  

VP  
PRN  
you  

What this means is that a tense auxiliary like are has two projections: a smaller intermediate projection (T’) formed by merging are with its complement trying to help you to form the T-bar (intermediate tense projection) are trying to help you; and a larger maximal projection (TP) formed by merging the resulting T’ are trying to help you with its subject we to form the TP We are trying to help you. Saying that TP is the maximal projection of are in (17) means it is the largest constituent headed by the auxiliary are.

Why should tense auxiliaries require two different projections, one in which they merge with a following complement to form a T-bar, and another in which the resulting T-bar merges with a preceding subject to form a TP? Following a suggestion made by Chomsky (1982, p.10), the requirement for auxiliaries to have two projections (as in (17) above) was taken in earlier work to be a consequence of a principle of Universal Grammar known as the Extended Projection Principle (conventionally abbreviated to EPP), which can be outlined informally as follows:

(18)  

Extended Projection Principle/EPP  
A finite tense constituent T must be extended into a TP projection containing a subject.

Given that (as we noted at the end of the previous chapter) the grammatical properties of words are described in terms of sets of grammatical features, Chomsky in later work posited that tense auxiliaries like are carry an [EPP] feature which requires them to have an extended phrasal projection into a TP which has a subject. If we posit that all tense auxiliaries carry an [EPP] feature, it follows that any structure (like that produced by speaker B in (16) above) containing a tense auxiliary which does not have a subject will be ungrammatical.

The EPP requirement (for a finite auxiliary to have a subject) would seem to be essentially syntactic (rather than semantic) in nature, as we can see from sentences such as (19) below:

(19)(a)  
It was alleged that he lied under oath  
(b)  
There has been no trouble

In structures like (19), the italicised subject pronouns it/there seem to have no semantic content (in particular, no referential properties) of their own, as we see from the fact that neither can be questioned by the corresponding interrogative words what?/where? (cf. the ungrammaticality of *What was alleged that he lied under oath? and *Where has been no trouble?), and neither can receive contrastive focus (hence it/there cannot be contrastively stressed in sentences like (19) above). Rather, they function as expletive pronouns – i.e. pronouns with no intrinsic meaning which are used to satisfy the syntactic requirement for a finite auxiliary like was/has to have a subject.

It is interesting to note that theoretical considerations also favour a binary-branching TP analysis of clause structure like (17) over a ternary-branching S analysis like (15). The essential spirit of Minimalism is to reduce the theoretical apparatus which we use to describe syntactic structure to a minimum. For example, it has been suggested (e.g. by Kayne 1994, Yang 1999 and Chomsky 2001) that tree diagrams should only contain information about hierarchical structure (i.e. containment/constituent structure
relations), not about linear structure (i.e. left-to-right word order), because linear information is redundant (in the sense that it can be predicted from hierarchical structure by simple word-order rules) if we use binary-branching trees. Suppose for example that we have a word-order rule for English to the effect that ‘Any constituent of a phrase HP which is the sister of the head H is positioned to the right of H, but any other constituent of HP is positioned to the left of H’. This word-order rule will correctly predict (inter alia) that the VP trying to help you in (17) must be positioned to the right of the tense auxiliary/T are (because the relevant VP is the sister of are), and that the pronoun we must be positioned to the left of are (because we is not the sister of are). As you can see for yourself, it’s not clear how we can achieve the same result (of eliminating redundant word-order information from trees) under a ternary-branching analysis like (15), since both the pronoun we and the verb phrase trying to help you are sisters of are in (15). It should be noted in passing that an important consequence of assuming that linear order is not a syntactic relation is that it entails that syntactic operations cannot be sensitive to word order (e.g. we can’t handle subject-auxiliary agreement by saying that a finite auxiliary agrees with a preceding noun or pronoun expression): rather, all syntactic operations must be sensitive to hierarchical rather than linear structure. How this works in practice will become clearer as our exposition unfolds.

A question which we have not so far asked about the structure of clauses concerns what role is played by complementisers like that, for and if, e.g. in speaker B’s reply in (20) below:

(20)  
SPEAKER A: What are you saying?  
SPEAKER B: That we are trying to help you

Where does the C/complementiser that fit into the structure of the sentence? The answer suggested in work in the 1970s was that a complementiser merges with an S constituent like that in (15) above to form an S'/S-bar (pronounced ‘ess-bar’) constituent like that shown below (simplified by not showing the internal structure of the VP trying to help you, which is as in (11) above):

(21)  
\[
\begin{array}{c}
\text{C} \\
\text{S'} \\
\text{that} \\
\text{PRN} \\
\text{T} \\
\text{VP} \\
\text{we} \\
\text{are} \\
\text{trying to help you}
\end{array}
\]

However, the claim that a clause introduced by a complementiser has the status of an S-bar constituent falls foul of the Headedness Principle (12), which requires that every syntactic structure be a projection of a head word. The principle is violated because S-bar in (21) is analysed as a projection of the S constituent we are trying to help you, and S is clearly not a word (but rather a string of words).

An interesting way round the headedness problem is to suppose that the head of a clausal structure introduced by a complementiser is the complementiser itself: since this is a single word, there would then be no violation of the Headedness Principle (12) requiring every syntactic structure to be a projection of a head word. Let’s therefore assume that the complementiser that merges with the TP we are trying to help you (whose structure is shown in (17) above) to form the CP/complementiser projection/complementiser phrase in (22) below:

(22)  
\[
\begin{array}{c}
\text{CP} \\
\text{C} \\
\text{That} \\
\text{PRN} \\
\text{we} \\
\text{T} \\
\text{are} \\
\text{V} \\
\text{trying} \\
\text{TP} \\
\text{T} \\
\text{to} \\
\text{V} \\
\text{help} \\
\text{PRN} \\
\text{you}
\end{array}
\]
(22) tells us that the complementiser that is the **head** of the overall clause *that we are trying to help you* (and conversely, the overall clause is a **projection** of *that*) – and indeed this is implicit in the traditional description of such structures as *that*-clauses. (22) also tells us that the complement of *that* is the TP/tense phrase *we are trying to help you*. Clauses introduced by complementisers have been taken to have the status of CP/complementiser phrase constituents since the pioneering work of Stowell (1981) and Chomsky (1986b).

An interesting aspect of the analyses in (17) and (22) above is that clauses and sentences are analysed as **headed** structures – i.e. as projections of head words (in conformity with the Headedness Principle). In other words, just as phrases are projections of a head word (e.g. a verb phrase like *help you* is a projection of the verb *help*), so too a sentence like *We will help you* is a projection of the auxiliary *will*, and a complement clause like the bracketed *that*-clause in *I can’t promise [that we will help you]* is a projection of the complementiser *that*. This enables us to arrive at a unitary analysis of the structure of phrases, clauses and sentences, in that clauses and sentences (like phrases) are projections of head words. More generally, it leads us to the conclusion that clauses/sentences are simply particular kinds of phrases (e.g. a *that*-clause is a complementiser phrase).

An assumption which is implicit in the analyses which we have presented here is that phrases and sentences are **derived** (i.e. formed) in a **bottom-up** fashion (i.e. they are built up from bottom to top). For example, the clause in (22) involves the following sequence of **merger** operations: (i) the verb *help* is merged with the pronoun *you* to form the VP *help you*; (ii) the resulting VP is merged with the nonfinite T/tense particle *to* to form the TP *to help you*; (iii) this TP is in turn merged with the verb *trying* to form the VP *trying to help you*; (iv) the resulting VP is merged with the T/tense auxiliary *are* to form the T-bar *are trying to help you*; (v) this T-bar is merged with its subject *we* to form the TP *we are trying to help you*; and (vi) the resulting TP is in turn merged with the C/complementiser *that* to form the CP structure *(22) that we are trying to help you*. By saying that the structure (22) is derived in a **bottom-up** fashion, we mean that lower parts of the structure nearer the bottom of the tree are formed before higher parts of the structure nearer the top of the tree. (An alternative **top-down** model is presented in Phillips 2003: but see Chomsky 2006, p.4 for a suggestion that the bottom-up/top-down dichotomy may be a false one.)

### 2.4 Specifiers

A question which arises from our analysis of tense auxiliaries in (17/22) above as having an immediate projection into T-bar and an extended projection into TP is whether there are other constituents which can have both an intermediate and an extended projection. The answer is ‘Yes’, as we can see by comparing the alternative answers (23i/ii) given by speaker B below:

(23) **SPEAKER A**: Where did she hit him? **SPEAKER B**: (i) *On the nose* (ii) *Right on the nose*

Let’s first look at the structure of reply (i) *On the nose* in (23B), before turning to consider the structure of reply (ii) *Right on the nose*. *On the nose* in (23Bi) is a prepositional phrase/PP derived in the following fashion. The determiner *the* is merged with the noun *nose* to form the DP/determiner phrase *the nose* in (24) below:

(24) $\begin{array}{c}
\text{DP} \\
\text{D} \quad \text{N} \\
\text{the} \quad \text{nose}
\end{array}$

(In work in the 1960s and 1970s, expressions like *the nose* were taken to have the categorial status of a NP/noun phrase; but here we follow more recent work dating from Abney 1987 which takes them to have the status of a DP/determiner phrase.) The preposition *on* is then merged with the resulting DP *the nose* to form the prepositional phrase/PP *on the nose*, which has the structure (25) below:

(25) $\begin{array}{c}
\text{PP} \\
\text{P} \\
\text{on} \\
\text{DP} \\
\text{D} \quad \text{N} \\
\text{the} \quad \text{nose}
\end{array}$
The overall expression *on the nose* is a projection of the preposition *on* and so has the status of a prepositional phrase: the head of the PP *on the nose* is the preposition *on* and the complement of the preposition *on* is the DP *the nose*. Given the traditional assumption that a verb or preposition which takes a noun or pronoun expression as its complement is transitive, *on* is a transitive preposition in this use, and *the nose* is its complement.

Now consider the structure of reply (ii) *right on the nose* in (23b). This differs from the PP *on the nose* in that it also contains the adverb *right*. It seems implausible to suppose that the adverb *right* is the head of the overall expression, since this would mean that *right on the nose* was an adverbial phrase/ADVP: on the contrary, it seems more plausible to suppose that *right on the nose* is a prepositional phrase/PP in which the adverb *right* is a modifier of some kind which serves to extend the prepositional expression *on the nose* into the even larger prepositional expression *right on the nose* (so that the head of the structure is once again the preposition *on*). Some evidence that *right on the nose* is a PP (and not an ADVP) comes from cleft sentences (i.e. structures of the form *It was a car that John bought*, where the italicised constituent *a car* is said to be focused, and hence to occupy focus position in the cleft sentence structure). As we see from (26) below:

(26)(a) It was *with great sadness* that he announced the resignation of the chairman  
(b) *It was very sadly* that he announced the resignation of the chairman

a prepositional phrase/PP like *with great sadness* can be focused in a cleft sentence, but not an adverbial phrase/ADVP like *very sadly*. In the light of this observation, consider the sentences below:

(27)(a) It was *on the nose* that she hit him  
(b) It was *right on the nose* that she hit him

The fact that both *on the nose* and *right on the nose* can occupy focus position in a cleft sentence suggests that both are PP/prepositional phrase constituents: *right on the nose* cannot be an ADVP/adverbial phrase since we see from (26b) above that adverbial expressions cannot be focused in cleft sentences.

The conclusion we reach from the data in (26-27) above is that the adverb *right* in *right on the nose* serves to extend the prepositional expression *on the nose* into the even larger prepositional expression *right on the nose*. Using the bar notation introduced in (17) above, we can analyse *right on the nose* in the following terms. The preposition *on* merges with its DP complement *the nose* to form the intermediate prepositional projection *on the nose* which has the categorial status of P' (or P-bar, pronounced ‘pee-bar’); the resulting P-bar *on the nose* is then merged with the adverb *right* to form the PP below:

(28)

\[ \text{ADV} \quad \text{P'} \quad \text{P} \quad \text{DP} \quad \text{N} \quad \text{nose} \]

In other words, just as a tense auxiliary like *are* can be projected into a T' like *are trying to help you* by merger with a following VP complement and then further projected into TP by merger with a preceding pronoun subject such as *we*, so too a preposition like *on* can be projected into a P' like *on the nose* by merger with a following DP complement and then further projected into a PP like *right on the nose* by merger with a preceding adverbial modifier such as *right*.

Although *we* in (17) serves a different grammatical function from *right* in (28) (in that *we* is the subject of *are trying to help you*, whereas *right* is a modifier of *on the nose*), there is a sense in which the two occupy parallel positions within the overall structure containing them: just as *we* merges with a T' to form a TP, so too *right* merges with a P' to form a PP. Introducing a new technical term at this point, let’s say that *we* serves as the specifier of the T *are*, of the T-bar *are trying to help you* and of the TP *we are trying to help you* in (17), and that *right* likewise serves as the specifier of the P *on*, of the P-bar *on the nose* and of the PP *right on the nose* in (28). More generally, we can say that a specifier is an expression which merges with an intermediate projection H-bar (where H-bar is a projection of some head word H) to project it into a maximal projection HP in the manner shown in (29) below:
Given the informal word order generalisation we suggested earlier (‘Any constituent of a phrase HP which is the sister of the head H is positioned to the right of H, but any other constituent of HP is positioned to the left of H’), it follows that heads precede complements but specifiers precede heads in English: in other words, English is a language with complement-last and specifier-first word order.

The assumption that determiners can head projections of their own also has interesting theoretical implications. We see from (29) above that syntactic heads can typically be merged with both a complement and a specifier. If quantifiers function as heads, we should expect that they too will allow an appropriate kind of expression to function as their specifier (in an appropriate kind of structure). In this connection, consider the following contrast:

\[(30)\]
\[
\begin{array}{l}
(a) \quad I \ have \ never \ known \ a \ patient \ make \ a \ quite \ so \ rapid \ recovery \\
(b) \quad I \ have \ never \ known \ a \ patient \ make \ quite \ so \ rapid \ a \ recovery
\end{array}
\]

Modifiers in English are typically positioned between a quantifier like *a* and a noun like *recovery* – and indeed this is the case with the modifying expression *quite so rapid* in (30a). However, in expressions like *quite so rapid* which contain a degree word like *so/too/how*, the whole degree expression can instead be positioned in front of a quantifier like *a* – as in (30b). What syntactic position does the degree expression occupy in such cases? We can give a principled answer to this question if we assume that quantifiers can project into quantifier phrases, since we can then say that a degree expression positioned in front of a quantifier occupies \textit{spec-QP} – i.e. the specifier position within the quantifier phrase. On this view, (30b) would have the skeletal structure shown below (where we follow Abney 1987 in taking an expression like *quite so rapid* to be a a projection of the \textit{DEG}/degree word *so*, and hence to be a \textit{DEGP} constituent):

\[(31)\]
\[
\begin{array}{c}
\text{QP} \\
\text{DEGP} \quad \text{quite so rapid} \\
\text{Q} \\
\text{N} \quad \text{a} \\
\text{recovery}
\end{array}
\]

An analysis like (31) would mean that there is symmetry between the structure of quantifier phrases and other types of phrase, in that (like other phrases), QPs allow a specifier of an appropriate kind. Indeed, although its internal structure is not shown in (31), the \textit{DEGP} *quite so rapid* could be argued to have a similar \textit{specifier+head+complement} structure, with the degree word *so* serving as its head, the adjective *rapid* as its complement, and the adverb *quite* as its specifier.

As those of you familiar with earlier work will have noticed, the kind of structures we are proposing here are very different from those assumed in traditional grammar and in work in Linguistics in the 1960s and 1970s. Earlier work implicitly assumed that only items belonging to \textit{substantive/lexical categories} could project into phrases, not words belonging to \textit{functional categories}. More specifically, earlier work assumed that there were noun phrases headed by nouns, verb phrases headed by verbs, adjectival phrases headed by adjectives, adverbial phrases headed by adverbs and prepositional phrases headed by prepositions. However, more recent work has argued that not only content words but also function words can project into phrases, so that we have tense phrases headed by a tense-marker, complementiser phrases headed by a complementiser, determiner phrases headed by a determiner – and so on. More generally, the assumption made in work over the last 20 years or so is that in principle all word-level categories can project into phrases. This means that some of the structures we make use of here may seem (at best) rather strange to those of you with a more traditional background, or (at worst) just plain \textit{wrong}. However, the structure of a given phrase or sentence cannot be determined on the basis of personal prejudice or pedagogical precepts inculcated into you at secondary school, but rather has to be determined on the basis of syntactic evidence of the kind discussed in §2.6 below. I would therefore ask traditionalists to be prepared to be open to new ideas and new analyses (a prerequisite for understanding in any discipline).
2.5 Intermediate and maximal projections

One aspect of our analysis of prepositional phrases which might at first sight seem puzzling is that the same expression on the nose is analysed as a PP in (23bi/25), but as a P-bar in (23bii/28). Why should this be? The answer is that the label PP denotes the maximal projection of (i.e. the largest expression headed by) the relevant preposition in a given structure. In (23bi), speaker B replies on the nose: since the largest expression headed by on in (23bi) is on the nose, it follows that on the nose has the status of a PP here. By contrast, in (23bii) speaker B replies right on the nose: here, on the nose is not the largest expression headed by on, and hence is not a PP but rather a P-bar; on the contrary, the largest expression headed by on in (23bii) is right on the nose, so it is this larger expression which has the status of PP.

Interestingly, there is some empirical evidence in support of the claim that on the nose is not a PP in (23bii/28). As we see from examples like (32) below, a PP (like that italicised below) can generally be preposed/fronted (i.e. moved to the front of the sentence) in order to highlight it:

(32)(a) They found a safe under the floorboards (b) Under the floorboards, they found a safe

In the light of this observation, consider the following examples (where right in each case is to be interpreted as a modifier of on the nose):

(33)(a) She hit him right on the nose (b) Right on the nose, she hit him

(c) *On the nose, she hit him right

The fact that right on the nose can be preposed in (33b) but not on the nose in (33c) provides evidence in support of the claim in (28) that right on the nose is a PP in (33a) but on the nose is not. If we assume that only maximal projections can be preposed, it follows that right on the nose can be preposed in (33) because it is the maximal projection of the preposition on (hence a PP), whereas on the nose cannot because it is an intermediate projection of the preposition on (hence a P-bar).

Although we have pointed out similarities between the structure of a PP like that in (28) and the structure of a TP like that in (17), there is a very important difference between the two. As we saw earlier from the grammaticality of We are trying to help you and the ungrammaticality of *Are trying to help you as replies to the question What are you doing? tense auxiliaries like are obligatorily require an appropriate specifier (e.g. a subject pronoun like we). By contrast, the fact that we can reply either on the nose or Right on the nose to a question like Where did she hit him? tells us that prepositions can be used either with or without an appropriate kind of specifier (e.g. an adverbial modifier like right). So, a significant difference between auxiliaries and prepositions is that it is obligatory for an auxiliary to have a specifier but optional for a preposition to have a specifier.

Just as prepositional phrases can have an (optional) adverbial modifier as their specifier, so too can adjectival phrases – as we see from the alternative replies given by speaker B in (34) below:

(34) SPEAKER A: How does your mother feel about your brother’s success?
SPEAKER B: (i) Proud of him (ii) Very proud of him

Reply (i) proud of him in (34b) is an adjectival phrase/adjective derived as follows. The preposition of merges with the pronoun him to form the PP/prepositional phrase of him. This is then merged with the adjective proud to form the AP/adjectival phrase proud of him, which has the structure (35) below:

(35)    A
       /  
      PP
     /   
P  PRN
   /   |
 of  him

But what is the structure of reply (ii) Very proud of him in (34b)? This differs from Proud of him in that it contains the adverb very. It seems implausible that the adverb very could be the head of the overall expression Very proud of him since this would mean that very proud of him was an ADVP (adverbial phrase); but an ADVP analysis would be problematic because a question like How does she feel? can have an adjectival expression like Happy as an appropriate reply but not an adverbial expression like Happily. Since very proud of him can be used to reply to the how-question asked by speaker A in (34), very proud of
*him* must be an adjectival expression headed by the adjective *proud*. Using the bar notation introduced earlier, we can say that the A/adjective *proud* merges with its PP/prepositional phrase complement *of him* to form the A-bar (intermediate adjectival projection) *proud of him*, and that the resulting A-bar in turn merges with the adverbial specifier *very* to form the full AP/adjectival phrase in (36) below:

(36)  
```
  +AP
  |   ADV
  |   very
  \    A'
    A
    PP
    P
    PRN
    of
    him
```

Evidence in support of the analysis in (36) comes from data relating to the preposing of adjectival expressions in sentences such as (37) below:

(37)  
(a) She certainly seems to be *very proud of him*
(b) Very *proud of him*, she certainly seems to be
(c) *Proud of him*, she certainly seems to be very

If we assume (as we did in our earlier discussion of (33) above) that only maximal projections can be preposed in this way (not intermediate projections), we can provide a straightforward account of the data in (37) in terms of the analysis in (36). The structure in (36) tells us that *very proud of him* is the maximal projection of the adjective *proud*, and so is an AP/adjectival phrase constituent; hence it can be preposed in (37a) by virtue of its status as a maximal projection. By contrast, (34) tells us that *proud of him* is an intermediate projection of the adjective *proud* and hence an A-bar constituent: because only maximal projections like AP can be preposed, and because *proud of him* is only an intermediate A-bar projection, it cannot be preposed – hence the ungrammaticality of (37c).

A variety of other types of expression can also have extended projections via merger with an optional specifier of an appropriate kind. One such are adverbial expressions like those italicised in (38) below:

(38)  
(a) She made up her mind *independently of me*
(b) She made up her mind *quite independently of me*

The adverb *independently* can be merged with a PP/prepositional phrase complement like *of me* to form the adverbial expression *independently of me*: this can either serve as a ADVP/adverbial phrase on its own – as in (38a) – or can serve as an intermediate ADV-bar projection which can be extended into an ADVP by merger with an appropriate specifier (like the adverb *quite*) as in (38b).

Much the same might be said about the italicised noun phrases in (39) below (if the analysis of these structures in Radford 1993 is along the right lines):

(39)  
(a) The opposition will oppose the/any *ban on imports*
(b) The opposition will oppose *the (government) ban on imports*

The noun *ban* can be merged with a following prepositional phrase complement like *on imports* to form the nominal expression *ban on imports*: this can either serve as a complete noun phrase/NP on its own, or can serve as an intermediate N-bar projection which is subsequently merged with an appropriate specifier (like the noun *government*) to form the larger noun phrase/NP *government ban on imports*. Because a noun expression headed by a singular count noun (like *ban*) must be modified by a determiner or quantifier, the resulting NP in either case must subsequently be merged with a determiner like *the* or a quantifier like *any*, so deriving a DP/determiner phrase like *the (government) ban on imports* or a QP/quantifier phrase like *any (government) ban on imports*.

In all of the structures which we have looked at so far which contain a specifier (i.e. in (17), (22), (28), (36), (38b) and (39b) above), the specifier has been a single word. However, this is by no means always the case, as we can see by comparing the two clauses in (40) below:

(40)  
(a) *He* has resigned
(b) The chairman has resigned

(40a) is derived by merging the T/tense auxiliary *has* with its verb complement *resigned* to form the
intermediate T-bar projection *has resigned*, and then merging the resulting T-bar with the pronoun *he* which serves as its specifier/subject to derive the extended TP projection in (41) below:

(41)  
\[
\begin{array}{c}
\text{TP} \\
\text{PRN} \\
\text{He} \\
\text{T'} \\
\text{has} \\
\text{resigned}
\end{array}
\]

Now consider how we derive (40b) *The chairman has resigned*. As before, the tense auxiliary *has* merges with its verb complement *resigned* to form the T-bar *has resigned*; and as before, the resulting T-bar then merges with its subject specifier. However, this time the subject is not the single word *he* but rather a determiner phrase/DP *the chairman* which has itself been formed by merging the determiner *the* with the noun *chairman*. The result of merging the DP *the chairman* with the T-bar *has resigned* is to derive the TP (42) below:

(42)  
\[
\begin{array}{c}
\text{TP} \\
\text{DP} \\
\text{D} \\
\text{N} \\
\text{T} \\
\text{V} \\
\text{The} \\
\text{chairman} \\
\text{has} \\
\text{resigned}
\end{array}
\]

Evidence that *the chairman* is indeed the subject (and specifier) of *has* in (42) comes from auxiliary inversion facts in relation to sentences such as:

(43)(a)  
*Has he resigned?*  

(b)  
*Has the chairman resigned?*

As we see by comparing the statement (40a) *He has resigned* with the corresponding question (43a) *Has he resigned?* a question like (43a) is formed by moving a finite auxiliary (*has*) in front of its subject (*he*). Hence, the fact that the auxiliary *has* in (40b) moves in front of *the chairman* in (43b) *Has the chairman resigned?* suggests that *the chairman* is the subject of *has* in (40b) *The chairman has resigned* – precisely as is claimed in (42).

If we compare (41) with (42), we can see that a specifier can either be a single word like *we* in (41) or a phrase like the DP *the chairman* in (42). In much the same way, a complement can either be a single word or a phrase. For example, in (42), the complement of *has* is the verb *resigned*; but in a more complex structure like (44) below:

(44)  
\[
\begin{array}{c}
\text{TP} \\
\text{DP} \\
\text{D} \\
\text{N} \\
\text{T} \\
\text{V} \\
\text{VP} \\
\text{P} \\
\text{PP} \\
\text{from} \\
\text{DP} \\
\text{D} \\
\text{N} \\
\text{the} \\
\text{board}
\end{array}
\]

the complement of *has* is the verb phrase *resigned from the board*, which is formed by merging the verb *resigned* with its PP/prepositional phrase complement *from the board.*
2.6 Testing structure

Thus far, we have argued that phrases and sentences are built up by merging successive pairs of constituents into larger and larger structures, and that the resulting structure can be represented in terms of a labelled tree diagram. The tree diagrams which we use to represent syntactic structure make specific claims about how sentences are built up out of various different kinds of constituent (i.e. syntactic unit): hence, trees can be said to represent the constituent structure of sentences. But this raises the question of how we know (and how we can test) whether the claims made about syntactic structure in tree diagrams are true. So far, we have relied mainly on intuition in analysing the structure of sentences – we have in effect guessed at the structure. However, it is unwise to rely on intuition in attempting to determine the structure of a given expression in a given language. For, while experienced linguists over a period of years tend to acquire fairly strong intuitions about structure, novices by contrast tend to have relatively weak, uncertain, and unreliable intuitions; moreover, even the intuitions of supposed experts may ultimately turn out to be based on little more than personal preference.

For this reason, it is more satisfactory (and more accurate) to regard constituent structure as having the status of a theoretical construct. That is to say, it is part of the theoretical apparatus which linguists find they need to make use of in order to explain certain data about language (just as molecules, atoms and subatomic particles are constructs which physicists find they need to make use of in order to explain the nature of matter in the universe). It is no more reasonable to rely wholly on intuition to determine syntactic structure than it would be to rely on intuition to determine molecular structure. Inevitably, then, much of the evidence for syntactic structure is of an essentially empirical character, based on the observed grammatical properties of particular types of expression. The evidence typically takes the form ‘If we posit that such-and-such an expression has such-and-such a constituent structure, we can provide a principled account of the observed grammatical properties of the expression.’ Thus, structural representations ultimately have to be justified in empirical terms, i.e. in terms of whether or not they provide a principled account of the grammatical properties of phrases and sentences.

So, a tree diagram like (44) has the status of a hypothesis (i.e. untested and unproven assumption) about the structure of the corresponding sentence The chairman has resigned from the board. How can we test our hypothesis and determine whether (44) is or isn’t an appropriate representation of the structure of the sentence? The answer is that there are a number of standard heuristics (i.e. ‘tests’) which we can use to determine structure. One such test relates to the phenomenon of co-ordination. English and other languages have a variety of coordinating conjunctions (which we might designate by the category label CONJ – or perhaps just J) like and/ but/ or/ which can be used to co-ordinate (= conjoin = join together) expressions such as those bracketed below:

(45)(a) [fond of cats] and [afraid of dogs] (b) [slowly] but [surely] (c) [to go] or [to stay]

In each of the expressions in (45), an italicised co-ordinating conjunction has been used to conjoin the bracketed pairs of expressions. Clearly, any adequate grammar of English will have to provide a principled answer to the question: ‘What kinds of strings (i.e. sequences of words) can and cannot be coordinated?’

Now, it turns out that we can’t just co-ordinate any random set of strings, as we see by comparing the grammatical reply produced by speaker B in (46) below:

(46) SPEAKER A: What does he do to keep fit?
SPEAKER B: Run up the hill and up the mountain

with the ungrammatical reply produced by speaker B in (47) below:

(47) SPEAKER A: What did he do about his bills?
SPEAKER B: *Ring up the phone company and up the electricity company

Why should it be possible to co-ordinate the string up the hill with the string up the mountain in (46), but not possible to co-ordinate the string up the phone company with the string up the electricity company in (47)? We can provide a principled answer to this question in terms of constituent structure: the italicised string up the hill in (46) is a constituent of the phrase run up the hill (up the hill is a prepositional phrase, in fact), and so can be co-ordinated with another similar type of prepositional phrase (e.g. a PP such as up the mountain, or down the hill, or along the path, etc.). Conversely, however, the string up the phone company in (47) is not a constituent of the phrase ring up the phone company, and so cannot be
co-ordinated with another similar string like *up the electricity company*. (Traditional grammarians say that *up* is associated with *ring* in expressions like *ring up someone*, and that the expression *ring up* forms a kind of complex verb which carries the sense of *telephone*.) On the basis of contrasts such as these, we can formulate the following generalisation:

(48) Only constituents of the same type can be co-ordinated

A constraint (i.e. principle imposing restrictions on certain types of grammatical operation) along the lines of (48) is assumed in much work in traditional grammar.

Having established the constraint (48), we can now make use of it as a way of testing the tree diagram in (44) above. In this connection, consider the data in (49) below (in which the bracketed strings have been co-ordinated by *and*):

(49)(a) The chairman has resigned from [*the board*] and [*the company*]

(b) The chairman has resigned [*from the board*] and [*from the company*]

(c) The chairman has [*resigned from the board*] and [*gone abroad*]

(d) The chairman [*has resigned from the board*] and [*is living in Utopia*]

(e) *The [*chairman has resigned from the board*] and [*company has replaced him*]

(f) [*The chairman has resigned from the board*] and [*the company has replaced him*]

(49a) provides us with evidence in support of the claim in (44) that *the board* is a determiner phrase constituent, since it can be co-ordinated with another DP like *the company*; similarly, (49b) provides us with evidence that *from the board* is a prepositional phrase constituent, since it can be co-ordinated with another PP like *from the company*; likewise, (49c) provides evidence that *resigned from the board* is a verb phrase constituent, since it can be co-ordinated with another VP like *gone abroad*; in much the same way, (49d) provides evidence that *has resigned from the board* is a T-bar constituent, since it can be co-ordinated with another T* like *is living in Utopia* (thereby providing interesting empirical evidence in support of the binary-branching structure assumed in the TP analysis of clauses, and against the ternary-branching analysis assumed in the S analysis of clauses); and in addition, (49f) provides evidence that *the chairman has resigned from the board* is a TP constituent, since it can be co-ordinated with another TP like the company have replaced him. Conversely, however, the fact that (49e) is ungrammatical suggests that (precisely as (44) claims) the string *chairman has resigned from the board* is not a constituent, since it cannot be co-ordinated with a parallel string like *company has replaced him* (and the constraint in (48) tells us that two strings of words can only be co-ordinated if both are constituents – and more precisely, if both are constituents of the same type). Overall, then, the co-ordination data in (49) provide empirical evidence in support of the analysis in (44). (It should be noted, however, that the co-ordination test is not always straightforward to apply, in part because there is more than one type of co-ordination – see e.g. Radford 1997a, pp. 104-107. Apparent complications arise in relation to sentences like ‘He is *cross with her and in a filthy mood*, where the AP/adjectival phrase *cross with her* has been co-ordinated with the PP/prepositional phrase *in a filthy mood*; to say that these seemingly different AP and PP constituents are ‘of the same type’ requires a more abstract analysis than is implied by category labels like AP and PP, perhaps taking them to share in common the property of being predicative expressions. (See Phillips 2003 for an alternative approach to co-ordination, and Johnson 2002 for problematic cases in German.)

There are a variety of other ways of testing structure, but we will mention only two here. (See Radford 1997a, pp. 102-116 for further tests). One is to use substitution as a way of testing whether a given string of words is a constituent or not, by seeing whether the relevant string can be substituted by (or serve as the antecedent of) a single word. In this connection, consider:

(50)(a) *The chairman* has resigned from the board, and *he* is now living in Utopia

(b) The press say that the chairman has resigned from the board, and *so* he has

(c) If the Managing Director says the chairman has resigned from the board, he must have *done*

(d) If the chairman has resigned from the board (*which* you say he has), how come his car is still in the company car park?

The fact that the expression *the chairman* in (50a) can be substituted (or referred back to) by a single word (in this case, the pronoun *he*) provides evidence in support of the claim in (44) that *the chairman* is a single constituent (a DP/determiner phrase, to be precise). Likewise, the fact that the expression *resigned from the board* in (50b/c/d) can serve as the antecedent of *so/done/which* provides evidence in support of
the claim in (44) that \textit{resigned from the board} is a constituent (more precisely, a VP/verb phrase).

A further kind of constituent structure test which we made use of in §2.5 above relates to the possibility of \textit{preposing} a constituent in order to highlight it in some way (i.e. in order to mark it out as a topic containing familiar/old information, or a focused constituent containing unfamiliar/new information). In our earlier discussion of (32), (33) and (37) above, we concluded that only a \textbf{maximal projection} can be highlighted in this way. This being so, one way we can test whether a given expression is a maximal projection or not is by seeing whether it can be preposed. In this connection, consider the following sentence:

\begin{enumerate}
  \item[(51)] The press said that the chairman would resign from the board, and \textit{resigned from the board} he has
\end{enumerate}

The fact that the italicised expression \textit{resigned from the board} can be preposed in (51) indicates that it must be a maximal projection: this is consistent with the analysis in (44) which tells us that \textit{resigned from the board} is a verb phrase which is the maximal projection of the verb \textit{resigned}.

However, an important caveat which should be noted in relation to the preposing test is that particular expressions can sometimes be difficult (or even impossible) to prepose even though they are maximal projections. This is because there are \textbf{constraints} (i.e. restrictions) on such movement operations. One such constraint can be illustrated by the following contrast:

\begin{enumerate}
  \item[(52)]\begin{enumerate}
    \item I will certainly try to give up smoking
    \item \textit{Give up smoking}, I will certainly try to
    \item *To give up smoking, I will certainly try
  \end{enumerate}
\end{enumerate}

Here, the VP/verb phrase \textit{give up smoking} can be highlighted by being preposed, but the TP/infinitival tense phrase \textit{to give up smoking} cannot – even though it is a maximal projection (by virtue of being the largest expression headed by infinitival \textit{to}). What is the nature of the restriction on preposing \textit{to+infinitive} expressions illustrated by the ungrammaticality of (52c)? The answer is not clear, but may be semantic in nature. When an expression is preposed, this is in order to highlight its semantic content in some way (e.g. for purposes of contrast – as in e.g. ‘Syntax, I don’t like but phonology I do’). It may be that its lack of intrinsic lexical semantic content makes infinitival \textit{to} an unsuitable candidate for highlighting, and this may in turn be reflected in the fact that infinitival \textit{to} cannot carry contrastive stress – as we see from the ungrammaticality of *‘I don’t want \textit{TO}, where capitals mark contrastive stress). What this suggests is that:

\begin{enumerate}
  \item[(53)] The smallest possible maximal projection is moved which contains the highlighted material
\end{enumerate}

So, if we want to highlight the semantic content of the VP \textit{give up smoking}, we prepose the VP \textit{give up smoking} rather than the TP \textit{to give up smoking} because the VP is smaller than the TP containing it.

However, this is by no means the only constraint on preposing, as we see from (54) below (where \textit{FBA} is an abbreviation for the \textit{Federal Bureau of Assassinations} – a purely fictitious body, of course):

\begin{enumerate}
  \item[(54)]\begin{enumerate}
    \item Nobody had expected that the FBA would assassinate the king of Ruritania
    \item *\textit{King of Ruritania}, nobody had expected that the FBA would assassinate
    \item The king of Ruritania, nobody had expected that the FBA would assassinate
    \item *The FBA would assassinate the king of Ruritania, nobody had expected that (NB. \textit{that} = \textit{ðə})
    \item That the FBA would assassinate the king of Ruritania, nobody had expected
  \end{enumerate}
\end{enumerate}

The ungrammaticality of (54b/d) tells us that we can’t prepose the NP \textit{King of Ruritania} or the TP \textit{the FBA would assassinate the King of Ruritania}. Why should this be? One possibility (briefly hinted at in Chomsky 1999) is that there may be a constraint on movement operations to the effect that a DP can be preposed but not an NP contained within a DP, and likewise that a CP can be preposed but not a TP contained within a CP. One implementation of this idea would be to posit a constraint like (55) below:

\begin{enumerate}
  \item [(55)] \textbf{Functional Head Constraint/FHC}
\end{enumerate}

The complement of a certain type of functional head \textit{F} (such as a determiner or complementiser) cannot be moved on its own (without also moving \textit{F})

Suppose, then, that we want to highlight the NP \textit{king of Ruritania} in (54) by preposing. (53) tells us to move the smallest possible maximal projection containing the highlighted material, and hence we first try to move this NP on its own: but the Functional Head Constraint tells us that it is not possible to prepose this NP on its own, because it is the complement of the determiner \textit{the}. We therefore prepose the next smallest maximal projection containing the highlighted NP \textit{king of Ruritania} – namely the DP \textit{the king of
It is useful to develop some terminology to describe the syntactic relations between constituents, since

The overall conclusion to be drawn from our discussion here is that the preposing test has to be used with care. If an expression can be preposed in order to highlight it, it is a maximal projection; if it cannot, this may either be because it is not a maximal projection, or because (even though it is a maximal projection) a syntactic constraint of some kind prevents it from being preposed, or because its head word has insufficient semantic content to make it a suitable candidate for highlighting.

2.7 Syntactic relations

Throughout this chapter, we have argued that phrases and sentences are formed by a series of binary merger operations, and that the resulting structures can be represented in the form of tree diagrams. Because they mark the way that words are combined together to form phrases of various types, tree diagrams are referred to in earlier technical work as phrase-markers (abbreviated to P-markers). They show us how a phrase or sentence is built up out of constituents of various types: hence, a tree diagram provides a visual representation of the constituent structure of the corresponding expression. Each node in the tree (i.e. each point in the tree which carries a category label like N, V, A', T, PP, CP etc.) represents a different constituent of the sentence; hence, there are as many different constituents in any given phrase marker as there are nodes carrying category labels. Nodes at the very bottom of the tree are called terminal nodes, and other nodes are non-terminal nodes: so, for example, all the D, N, T, V and P nodes in (44) are terminal nodes, and all the DP, PP, VP, T' and TP nodes are non-terminal nodes. The topmost node in any tree structure (i.e. TP in the case of (44) above) is said to be its root. Each terminal node in the tree carries a single lexical item (i.e. an item from the lexicon/dictionary, like dog or go etc.): lexical items are sets of phonological, semantic and grammatical features (with category labels like N, V, T, C etc. being used as shorthand abbreviations for the set of grammatical features carried by the relevant items).

It is useful to develop some terminology to describe the syntactic relations between constituents, since
these relations turn out to be central to syntactic description. Essentially, a P-marker is a graph comprising a set of points (= labelled nodes), connected by branches (= solid lines) representing containment relations (i.e. telling us which constituents contain or are contained within which other constituents). We can illustrate what this means in terms of the following abstract tree structure (where A, B, C, D, E, F, G, H and J are different nodes in the tree, representing different constituents):

(58)
```
( A       
  B    E  
  C   D  F  G  
    H  J 
```

In (58), G immediately contains H and J (and conversely H and J are the two constituents immediately contained within G, and hence are the two immediate constituents of G): this is shown by the fact that H and J are the two nodes immediately beneath G which are connected to G by a branch (solid line).

Likewise, E immediately contains F and G; B immediately contains C and D; and A immediately contains B and E. We can also say that E contains F, G, H and J; and that A contains B, C, D, E, F, G, H and J (and likewise that G contains H and J; and B contains C and D). Using equivalent kinship terminology, we can say that A is the mother of B and E (and conversely B and E are the two daughters of A); B is the mother of C and D; E is the mother of F and G; and G is the mother of H and J. Likewise, B and E are sisters (by virtue of both being daughters of A) – as are C and D; F and G; and H and J.

A particularly important syntactic relation is c-command (a conventional abbreviation of constituent-command), which provides us with a useful way of determining the relative position of two different constituents within the same tree (in particular, whether one is lower in the tree than the other or not). We can define this relation informally as follows (where X, Y and Z are three different nodes):

(59)
\[ \text{C-command} \]
\[ \text{A constituent } X \text{ c-commands its sister constituent } Y \text{ and any constituent } Z \text{ which is contained within } Y \]

For those of you who find it difficult to conceptualise such abstractions, a more concrete way of visualising this is to think of a tree diagram as representing a network of train stations, with each of the labelled nodes representing the name of a different station in the network, and the branches representing the rail tracks linking the stations. We can then say that one node X c-commands another node Y if you can get from X to Y on the network by taking a northbound train, getting off at the first station, changing trains there and then travelling one or more stops south on a different line.

In the light of the definition of c-command given above, let’s consider which constituents each of the nodes in (58) c-commands. A doesn’t c-command any of the other nodes, since A has no sister. B c-commands E, F, G, H and J because B’s sister is E, and E contains F, G, H and J. C c-commands only D, because Cs sister is D, and D does not contain any other constituent; likewise, D c-commands only C.

E c-commands B, C and D because B is the sister of E and B contains C and D. F c-commands G, H and J, because G is the sister of F and G contains H and J. G c-commands only F, because G’s sister is F, and F does not contain any other constituents. H and J likewise c-command each other only because they are sisters which have no daughters of their own.

We can illustrate the importance of the c-command relation in syntactic description by looking at the distribution of a class of expressions which are known as anaphors. These include reflexives (i.e. self/selves forms like myself/yourself/themselves etc.), and reciprocals like each other and one another. Such anaphors have the property that they cannot be used to refer directly to an entity in the outside world, but rather must by bound by (i.e. take their reference from) an antecedent elsewhere in the same phrase or sentence. Where an anaphor has no (suitable) antecedent to bind it, the resulting structure is ungrammatical – as we see from contrasts such as that in (60) below:

(60)(a)  He must feel proud of himself         (b)  *She must feel proud of himself
(c)  *Himself must feel proud of you

In (60a), the third person masculine singular anaphor himself is bound by a suitable third person masculine
singular antecedent (he), with the result that (60a) is grammatical. But in (60b), himself has no suitable antecedent (the feminine pronoun she is not a suitable antecedent for the masculine anaphor himself), and so is unbound (with the result that (60b) is ill-formed). In (60c), there is no antecedent of any kind for the anaphor himself, with the result that the anaphor is again unbound and the sentence ill-formed.

There are structural restrictions on the binding of anaphors by antecedents, as we see from:

(61)(a) **The president** may blame **himself**
(b) *Supporters of the president may blame **himself**

(62)(a) **They** may implicate **each other**
(b) *The evidence against **them** may implicate **each other**

As a third person masculine singular anaphor, himself must be bound by a third person masculine singular antecedent like the president; similarly, as a plural anaphor, each other must be bound by a plural antecedent like they/them. However, it would seem from the contrasts above that the antecedent must occupy the right kind of position within the structure in order to bind the anaphor or else the resulting sentence will be ungrammatical. The question of what is the right position for the antecedent can be defined in terms of the following structural condition:

(63) **C-command condition on binding**
A bound constituent must be c-commanded by an appropriate antecedent

The relevant bound constituent is the reflexive anaphor himself in (61), and its antecedent is the president; the bound constituent in (62) is the reciprocal anaphor each other, and its antecedent is they/them.

Sentence (61a) has the structure (64) below:

(64)                               TP
         DP                                        T
               D                  N               T
         The               president           may
         V                PRN
         blame            himself

The reflexive pronoun himself can be bound by the DP the president in (64) because the sister of the DP node is the T-bar node, and the pronoun himself is contained within the relevant T-bar node (by virtue of being one of the grandchildren of T-bar); consequently, the DP the president c-commands the anaphor himself and the binding condition (63) is satisfied. We therefore correctly specify that (61a) The president may blame **himself** is grammatical, with the president interpreted as the antecedent of himself.

But now consider why a structure like (65) below is ungrammatical (cf. (61b) above):

(65)                               TP
         NP                                        T
               N                  PP               T
         Supporters       of
               P                  DP
         the                president
         V                PRN
         blame            himself

The answer is that the DP node containing the president doesn’t c-command the PRN node containing himself, because the sister of the DP node is the P node of, and himself is not contained within (i.e. not a daughter, granddaughter, or great-granddaughter etc. of) the preposition of. Since there is no other appropriate antecedent for himself within the sentence (e.g. although the NP supporters of the president c-commands himself, it is not a suitable antecedent because it is a plural expression, and himself requires a singular antecedent), the anaphor himself remains unbound – in violation of the binding requirement on anaphors. This is the reason (61b) *Supporters of the president may blame **himself** is ungrammatical.
Our brief discussion of anaphor binding here highlights the fact that the relation **c-command** has a central role to play in syntax. It also provides further evidence for positing that sentences have a hierarchical constituent structure, in that the relevant restriction on the binding of anaphors in (63) is characterised in structural terms. There’s much more to be said about binding, though we shan’t pursue the relevant issues here: for technical discussion, see Reuland (2001a) and Reuland and Everaert (2001).

### 2.8 Bare phrase structure

In this chapter, we have used a system of category labels based on the bar notation which has been widely adopted since the 1970s. Within this framework, a sentence like (the title of Gloria Gaynor’s immortal song) *I will survive* has the structure (66) below:

(66)                                    
   TP                                        
     PRN       T'                                
       I                  V                          
         will          survive

The bar notation used in (66) posits that there are three different levels of projection (i.e. types of expression): (i) **heads** (also called **minimal projections**) like the T/ tense auxiliary *will*; (ii) **intermediate projections** like the T-bar *will survive*; and (iii) **maximal projections** like the TP *I will survive*. However, Chomsky (1999, p.2) argues that a system which posits three different types of category label for projections of a given head H (viz. H, H-bar and HP) violates the UG principle outlined informally below, which (2006, p.4) he takes to be ‘a natural principle of efficient computation’:

(67) **Inclusiveness Condition**

No new information can be introduced in the course of the syntactic computation

The reason why the bar notation used in trees like (66) violates inclusiveness is as follows. When the word *will* is taken out of the lexicon, its lexical entry specifies that it has a set of properties which include the grammatical properties represented by the category label T in (66). But the tree in (66) tells us that when *will* is merged with its complement *survive*, the resulting string *will survive* belongs to the category T-bar – in other words, it is an **intermediate projection** of *will*. Likewise, the tree in (66) also tells us that the larger string *I will survive* is a TP – in other words, it is the **maximal projection** of *will*. But this information about intermediate and maximal projections is not part of the lexical entry for *will*, and hence has seemingly been added in the course of the syntactic computation. However, adding such information about projection levels violates the **Inclusiveness Condition** (67). (Chomsky 2005b, p.5 posits a related **No Tampering Condition/NTC** to the effect that ‘Merge of X and Y… cannot break up X or Y, or add new features to them.’ By saying that merge cannot ‘break up’ an existing structure, he means that merge cannot e.g. add a constituent in the middle of an existing structure, only at its edge, so that ‘Merge is invariably “to the edge.”’)

One way of avoiding violation of inclusiveness is to remove all information about projection levels from trees, and hence replace a tree like (66) above by one like (68) below:

(68)                                    
   T                                        
     PRN       T                                
       I                  V                          
         will          survive

What our revised tree (68) says is that *will, will survive* and *I will survive* are all projections of the tense auxiliary *will* and hence are all **tense expressions**. Information about projection levels is omitted in (68) because it is redundant, since it is predictable from looking at the relative positions of constituents within a given structure. Simply by looking at the positions they occupy in the tree (68) we can tell that *will* is the minimal projection of *will* (i.e. it is the smallest expression headed by *will*), that *will survive* is an intermediate projection of *will* (by virtue of being neither the smallest nor the largest expression headed by
will) and that I will survive is the maximal projection of will (by virtue of being the largest expression headed by will). Similarly, we can tell that the V survive is both a minimal and a maximal projection, in that it is both the smallest and the largest expression headed by survive: hence (e.g.) it can behave like a maximal projection and undergo preposing (as in Survive, I will). In much the same way, we know from looking at the structure in (68) that the pronoun I is likewise both a minimal and a maximal projection: given their status as maximal projections, it follows that pronouns can undergo preposing (as with the pronoun him in Him, I would never trust). Since the information about projection levels in the bar notation is redundant, Chomskyan reasons, such information should not be represented in the system of category labels used in tree diagrams: after all, the goal of Minimalism is to reduce theoretical apparatus to the minimum which is conceptually necessary.

Chomsky (1995) and Uriagereka (1998) go even further and argue in favour of a theory of bare (i.e. category-free) phrase structure in which the nodes in trees do not carry category labels. We can illustrate the kind of reasoning behind their thinking in the following terms. In a category-based theory of syntax, the grammatical properties of a pronoun like he are described by assigning it to the category PRN of pronoun. But simply telling us that he belongs to the category PRN does not characterise its other grammatical properties – e.g. the fact that it is a third person expression, it is singular in number, masculine in gender, and nominative in case. The conventional way of describing grammatical properties like these is in terms of a set of features like [third-person], [singular-number], [masculine-gender], [nominative-case], with grammatical features conventionally enclosed within square brackets. But Chomsky (1965, 1970) argued that the categorial properties of words can also be described in terms of sets of grammatical features: one such feature might indicate that it is nominal (rather than verbal) in nature, and another might indicate that it is a function word (rather than a content word). If all the grammatical properties of words (including their categorial properties) can be described in terms of sets of grammatical features, the possibility arises that category labels like those in (49) can be entirely replaced by sets of features, so opening up the possibility of developing a theory of bare phrase structure – i.e. a theory in which there are no category labels in syntactic trees. A radical possibility along these lines would be for the structure of I will survive to be represented in terms of an unlabelled tree diagram like (69) below:

(69)

I

will

survive

An unlabelled tree diagram like (69) tells us that the constituents of (69) are I, will, survive, will survive and I will survive. The lexical entries for the items I, will and survive comprise sets of features which include information about their grammatical and selectional properties: e.g. the entry for will tells us that it is a finite auxiliary which selects an infinitival complement. The fact that will selects an infinitive complement (and that survive is an infinitive form and is the sister of will) means that survive must be the complement of will and hence that will survive is a projection of will. Likewise, the fact that will has an EPP-feature requiring it to project a subject means that the nominative pronoun I must be the subject of will, and hence that I will survive is an extended projection of will. As before, the relative position of the relevant constituents within the overall structure tells us that will is a minimal projection (of itself), will survive is an intermediate projection of will, and I will survive is the maximal projection of will. The overall conclusion we arrive at is that the information about category labels and projection levels in a conventional labelled tree diagram like (66) above may well be redundant. (69) could alternatively be represented in terms of a set diagram such as (60) below:

(70)  {I {will, survive}}

– or indeed by an equivalent unlabelled bracketing structure.

If the kind of reasoning outlined here is along the right lines, it opens up the possibility of developing a theory of bare phrase structure such as that outlined in a skeletal form in Chomsky (1995) and Uriagereka (1998) – though it should be noted that the relevant discussion in these two works is highly technical and not suitable for those who don’t have some mathematical background in set theory. However, we shall continue to use traditional labelled trees and the bar notation to represent structure,
category membership and projection levels throughout the rest of this book, since this remains the notation most widely used in contemporary work in syntax.

2.9 Summary

In this chapter, we have looked at how words are combined together to form phrases and sentences. In §2.2 we showed how more and more complex phrases can be built up by successive binary merger operations, each of which combines a pair of constituents to form a larger constituent. In §2.3 we argued that clauses containing a finite tense auxiliary are formed by merging the tense auxiliary with a verbal complement to form an intermediate T-bar projection which is then merged with a subject to form an extended TP/tense phrase projection. On this view, a sentence like *It may rain* would be formed by merging the present-tense auxiliary *may* with the verb *rain* to form the T-bar constituent *may rain*, and then merging the resulting T-bar with the pronoun *it* to derive the TP *It may rain*. We also noted the suggestion made by Chomsky in recent work that the requirement for tense auxiliaries to have a subject can be described by saying that a T-auxiliary has an EPP feature requiring it to have an extended phrasal projection containing a subject. We went on to suggest that clauses introduced by a complementiser/C are formed by merging C with a TP complement to form a CP/complementiser phrase. In §2.4 we argued that a prepositional phrase like *right on the nose* has a similar internal structure to a TP like *He has resigned*, and that in both cases the head P/T *on/has* merges with a following complement to form the intermediate P-bar/T-bar projection *on the nose/has resigned* which in turn is merged with a preceding specifier to form the extended PP/TP projection *right on the nose/he has resigned*. In §2.5 we went on to argue that other types of head (e.g. adjectives, adverbs, and nouns) can likewise project both into an intermediate projection via merger with a following complement, and into an extended projection via merger with a preceding specifier. We introduced the term maximal projection to denote the largest expression headed by a particular word in a given structure. In §2.6, we looked at ways of testing constituent structure, outlining tests relating to co-ordination, substitution, and preposing. We noted that a variety of factors can sometimes prevent constituents from being preposed in order to highlight them; for example, items with little or no substantive lexical content generally cannot be preposed, and there are also syntactic restrictions on preposing — e.g. such movement operations are subject to a Functional Head Constraint which bars the complement of a certain type of functional head (e.g. determiner or complementiser) from being moved on its own. In §2.7, we looked at the syntactic relations between constituents within tree diagrams, noting that the relation c-command plays a central role in syntax, e.g. in relation to anaphor binding. In §2.8 we discussed the potential redundancy in the system of labels used to represent categories and projection levels in traditional phrase structure trees, and noted that Chomsky has been seeking to develop a theory of bare phrase structure in recent work.

For those of you familiar with work in traditional grammar, it will be clear that the assumptions made about syntactic structure within the Minimalist framework are somewhat different from those made in traditional grammar. Of course, there are some similarities: within both types of framework, it is assumed that lexical categories project into phrases, so that by combining a noun with one or more other constituents we can form a noun phrase, and likewise by combining a verb/preposition/adjective/adverb with one or more other constituents we can form a verb phrase/prepositional phrase/adjectival phrase/adverbial phrase. But there are two major differences between the two types of framework. One is that Minimalism (unlike traditional grammar) assumes that function words also project into phrases (so that by combining a determiner with a noun expression we form a determiner phrase, by combining a (present or past tense) auxiliary/T with a complement and a subject we form a Tense Projection/TP, and by combining a complementiser with a TP we form a complementiser projection/CP. This in some cases results in an analysis which is rather different from that found in traditional grammar (e.g. in that *the nose* would be considered a noun phrase in traditional grammar, but is taken to be a determiner phrase within the framework adopted here). A further difference between the two frameworks is that Minimalism assumes that all syntactic structure is binary-branching, whereas traditional grammar (implicitly) does not.
**WORKBOOK SECTION**

**Exercise 2.1**
Discuss the derivation of the following sentences, showing how their structure is built up in a pairwise fashion by successive binary merger operations.

1. He has become very fond of Mary
2. She must be quite pleased to see you
3. He will need to ask for help
4. They are expecting to hear from you
5. You should try to talk to the president
6. Inflation is threatening to undermine the growth of the economy
7. He won’t admit that he was defrauding the company
8. Nobody could believe that Sam was working for the government

Show how evidence from co-ordination and proforms can be used in support of your analysis. In addition, say which constituents can (and cannot) be preposed – and why.

**Helpful hints**
Assume that the sentences are derived in a **bottom-up** fashion by first merging the last two words in the sentence to form a constituent, then merging the constituent thereby formed with the third-from-last word to form an even larger constituent, then merging this even larger constituent with the fourth-from-last word...and so on. (It should be noted, however, that while this simple procedure will work for most of the sentences in the two exercises in this chapter, it requires modification to handle more complex sentences – e.g. those with phrasal specifiers like sentences 1, 2, 5, 16 and 18 in exercise 2.2.) In 7, take won’t (for the purposes of this exercise) to be a single word occupying the head T position of TP.

**Model answer for 1**
Merging the preposition of with the noun Mary which serves as its complement derives the PP (prepositional phrase) in (i) below:

(i) \[ \text{PP} \]
\[ \text{P} \quad \text{N} \]
\[ \text{of} \quad \text{Mary} \]

Merging the adjective fond with the resulting PP (which is the complement of fond) forms the intermediate adjectival projection (A-bar) fond of Mary in (ii) below:

(ii) \[ \text{A'} \]
\[ \text{A} \]
\[ \text{PP} \]
\[ \text{fond} \]
\[ \text{P} \quad \text{N} \]
\[ \text{of} \quad \text{Mary} \]

Merging the A-bar in (ii) with the adverb very which serves as its specifier (in that it modifies fond of Mary) forms the AP/adjectival phrase in (iii) below:

(iii) \[ \text{AP} \]
\[ \text{ADV} \]
\[ \text{very} \]
\[ \text{A'} \]
\[ \text{A} \]
\[ \text{PP} \]
\[ \text{fond} \]
\[ \text{P} \quad \text{N} \]
\[ \text{of} \quad \text{Mary} \]

Merging the verb become with the AP very fond of Mary which serves as the complement of become
forms the VP/verb phrase in (iv) below:

(iv)

```
  VP
   \-----
    V
      become

  AP
     \------
      ADV
        very

  A'  
     \--
      A
        fond

  PP
      \----
       P
         of

       N
         Mary
```

Merging the tense auxiliary (T constituent) *has* with its verb phrase complement *become very fond of Mary* forms the intermediate T-bar projection (v) below:

(v)

```
  T'
     \----
      T
        has

  VP
   \-----
    V
      become

  AP
     \------
      ADV
        very

  A'  
     \--
      A
        fond

  PP
      \----
       P
         of

       N
         Mary
```

Merging the T-bar in (v) with the pronoun *he* which serves as its subjectspecifier will derive the TP:

(vi)

```
  TP
   \-----
    PRN
     He

  T'
     \----
      T
        has

  VP
   \-----
    V
      become

  AP
     \------
      ADV
        very

  A'  
     \--
      A
        fond

  PP
      \----
       P
         of

       N
         Mary
```

Evidence in support of the analysis in (vi) comes from co-ordination data in relation to sentences such as:

(vii)(a) He has become very fond [of Mary] and [of her sister]

(b) He has become very [fond of Mary] and [proud of her achievements]

(c) He has become [very fond of Mary] but [less fond of her sister]

(d) He has [become very fond of Mary] and [grown used to her mother]

(e) He has become very fond of Mary and [is hoping to marry her]

The fact that each of the italicised strings can be co-ordinated with another similar (bold-printed) string is consistent with the claim made in (vi) that *of Mary* is a PP, *fond of Mary* is an A-bar, *very fond of Mary* is an AP, *become very fond of Mary* is a VP and *has become very fond of Mary* is a T-bar.

Additional evidence in support of the analysis in (vi) comes from the use of the proforms *so/which* in:
(viii)(a) He is apparently very fond of Mary, though nobody expected him to become so
(b) If he has become very fond of Mary (which he has), why doesn’t he ask her out?

The fact that very fond of Mary is the antecedent of so in (viii)(a) is consistent with the claim made in (vi) that very fond of Mary is an AP; likewise, the fact that become very fond of Mary is the antecedent of which in (viii)(b) is consistent with the claim made in (vi) that become very fond of Mary is a VP.

If we look at the question of which expressions in the sentence can and cannot be preposed in order to highlight them, we find the following picture (? indicates questionable grammaticality):

(ix)(a) Mary, he (certainly) has become very fond of
(b) ?Of Mary, he (certainly) has become very fond
(c) *Fond of Mary, he (certainly) has become very
(d) Very fond of Mary, he (certainly) has become
(e) Become very fond of Mary, he (certainly) has
(f) *Has become very fond of Mary, he (certainly)

(Adding the adverb certainly improves the acceptability of some of the relevant sentences, for discourse reasons which need not concern us.) In (53) in the main text, we suggested that highlighting involves preposing the smallest possible maximal projection containing the focused material. Suppose that we want to highlight Mary via preposing. Since Mary is a maximal projection in (vi) by virtue of being the largest expression headed by the word Mary, preposing Mary in (ix)(a) yields a grammatical outcome, as expected. By contrast, preposing the prepositional phrase of Mary yields a somewhat degraded sentence, as we see from (ix)(b): this may be because if we want to highlight Mary alone, we prepose the smallest maximal projection containing Mary, and this is clearly the N Mary not the PP of Mary. There would only be some point in preposing of Mary if we wanted to highlight of as well as Mary; but since the preposition of (rather like infinitival to) has little or no semantic content (some linguists suggesting that it is a genitive case particle in this kind of use and hence a functor), an of-phrase is not a good candidate for highlighting. The string fond of Mary cannot be preposed in (ix)(c) because it is an intermediate (A-bar) projection of the adjective fond, not its maximal projection (the maximal projection of the adjective fond being the AP very fond of Mary). By contrast, the string very fond of Mary can be preposed in (ix)(d) by virtue of its status as the maximal projection of fond (i.e. the largest expression headed by fond). In (ix)(e) we see that become very fond of Mary can also be preposed by virtue of being the maximal projection of the verb become – even though it is the complement of the T constituent has; hence, either T is not a functional category (as suggested in Chomsky 1999), or else the Functional Head Constraint applies only to some functional categories (e.g. those like D and C which are the highest heads in nominal/clausal structures respectively). By contrast, the string has become very fond of Mary cannot be preposed in (ix)(f) because of its status as an intermediate (T-bar) projection of has – the corresponding maximal projection of has being the TP He has become very fond of Mary.

Helpful hints for sentences 2-7
Discuss whether the analysis you propose accounts for the (un)grammaticality of the sentences below.
(These represent intuitions about grammaticality in my own British English variety – which may of course be slightly different from those of other native speakers.)

Example 2
a) She must be quite pleased to see you and meet your mother
b) She must be quite pleased to see you and to meet your mother
c) She must be quite pleased to see you and glad that you are OK
d) She must be quite pleased to see you and very glad that you are OK
e) She must be quite pleased to see you and feel relieved that you’re OK
f) She must be quite pleased to see you but will not admit it
g) She must be quite pleased to see you, and you must be quite pleased to see her
h) If she is quite pleased to see you (which she must be), why not say so?
i) She must be quite pleased to see you, even if she doesn’t seem so.
j) You, she must be quite pleased to see (though not your brother)
k) ?See you, she must be quite pleased to
l) *To see you, she must be quite pleased
m) *Pleased to see you, she must be quite
n) Quite pleased to see you, she (certainly) must be
o) *Be quite pleased to see you, she (certainly) must
p) *Must be quite pleased to see you, she (certainly)

Example 3
a) He will need to ask for help and advice
b) He will need to ask for help and for advice
c) He will need to ask for help and seek advice
d) He will need to ask for help and to accept it
e) He will need to ask for help, and expect to get it
f) He will need to ask for help, but can’t count on it
g) He will need to ask for help, but he may not get any
h) If he has to ask for help (as he will need to), is he likely to get any?
i) If he has to ask for help (as he will need to), will he get any?
j) Help, he will (certainly) need to ask for (though not money)
k) *For help he will (certainly) need to ask (though not for money)
l) Ask for help, he will (certainly) need to
m) *To ask for help, he will (certainly) need
n) Need to ask for help, he (certainly) will
o) *Will need to ask for help, he (certainly)

Example 4
a) They are expecting to hear from you and her
b) They are expecting to hear from you and from her
c) They are expecting to hear from you and meet you
d) They are expecting to hear from you and to meet you
e) They are expecting to hear from you and dying to meet you
f) If they are expecting to hear from you (which they are), why didn’t they mention it?
g) They said they were expecting to hear from you, and so they are
h) You, they are expecting to hear from (though not your sister)
i) *From you, they are expecting to hear (though not from your sister)
j) Hear from you, they certainly are expecting to
k) *To hear from you, they certainly are expecting
l) Expecting to hear from you, they certainly are
m) *Are expecting to hear from you, they

Example 5
a) You should try to talk to the president and prime-minister
b) You should try to talk to the president and the prime-minister
c) You should try to talk to the president and to his aides
d) You should try to talk to the president and convince him
e) You should try to talk to the president and to persuade him
f) You should try to talk to the president and should contact his aides
g) If he thinks you should try to talk to the president (which I agree you should), why didn’t he tell me earlier?

h) You said I should try to talk to the president, and so I will
i) *President, you should try to talk to the
j) The president, you should (certainly) try to talk to
k) *To the president, you should certainly try to talk (though not to his aides)
l) Talk to the president, you should certainly try to
m) *To talk to the president, you should certainly try
n) Try to talk to the president, you (certainly) should
o) *Should try to talk to the president, you (certainly)
Example 6.
a) Inflation is threatening to undermine the growth of the economy and stock-market
b) Inflation is threatening to undermine the growth of the economy and the stock-market
c) Inflation is threatening to undermine the growth of the economy and of the stock-market
d) Inflation is threatening to undermine the growth of the economy and success of the stock-market
e) Inflation is threatening to undermine the growth of the economy and the success of the stock-market
f) Inflation is threatening to undermine the growth of the economy and jeopardise government spending
g) Inflation is threatening to undermine the growth of the economy and to jeopardise government spending
h) Inflation is threatening to undermine the growth of the economy and spiralling out of control
i) Inflation is threatening to undermine the growth of the economy and is spiralling out of control
j) If inflation is threatening to undermine the growth of the economy (which it is), why doesn’t the government increase taxes?
k) The prime-minister said that inflation is threatening to undermine the growth of the economy, and so it is.
l) *Economy, inflation is threatening to undermine the growth of
m) The economy, inflation is threatening to undermine the growth of
n) *Of the economy, inflation is threatening to undermine the growth
o) *Growth of the economy, inflation is threatening to undermine the
p) The growth of the economy, inflation is threatening to undermine
q) Undermine the growth of the economy, inflation is certainly threatening to
r) *To undermine the growth of the economy, inflation is (certainly) threatening
s) Threatening to undermine the growth of the economy, inflation (certainly) is
t) *Is threatening to undermine the growth of the economy, inflation (certainly)

Example 7
a) He won’t admit that he was defrauding the company and workforce
b) He won’t admit that he was defrauding the company and the workforce
c) He won’t admit that he was defrauding the company and bankrupting it
d) He won’t admit that he was defrauding the company and was bankrupting it
e) He won’t admit that he was defrauding the company and it was being bankrupted
f) He won’t admit that he was defrauding the company or that he was bankrupting it
g) He won’t admit that he was defrauding the company or concede that he lied
h) He won’t admit that he was defrauding the company and can’t see why he should
i) He won’t admit that he was defrauding the company and he doesn’t think he will get caught
j) If he won’t admit that he was defrauding the company (which he won’t), what can we do about it?
k) *Company, he won’t admit that he was defrauding the
l) The company, he won’t admit that he was defrauding
m) Defrauding the company, he won’t admit that he was
n) *Was defrauding the company, he won’t admit that he
o) *He was defrauding the company, he won’t admit that (= ∅σ)
p) That he was defrauding the company, he (certainly) won’t admit
q) Admit that he was defrauding the company, he (certainly) won’t
r) *Won’t admit that he was defrauding the company, he

Example 8
a) Nobody could believe that Sam was working for the government and opposition
b) Nobody could believe that Sam was working for the government and the opposition
c) Nobody could believe that Sam was working for the government and for the opposition
d) Nobody could believe that Sam was working for the government and siding with the opposition
e) Nobody could believe that Sam was working for the government and was siding with the opposition
f) Nobody could believe that Sam was working for the government and his wife was working for the opposition
g) Nobody could believe that Sam was working for the government and that his wife was working for the opposition
h) Nobody could believe that Sam was working for the government or imagine that his wife was working for the opposition
i) Nobody could believe that Sam was working for the government or could understand why his wife was working for the opposition
j) If people couldn’t believe that Sam was working for the government (which nobody could), why didn’t they ask him whether it was true?
k) If nobody could believe that Sam was working for the government (as he was), why didn’t they ask him whether it was true?
l) *Government, nobody could believe that Sam was working for the
m) The government, nobody could believe that Sam was working for
n) ??For the government, nobody could believe that Sam was working
o) Working for the government, nobody could believe that Sam (really) was
p) *Was working for the government, nobody could believe that Sam
q) *Sam was working for the government, nobody could believe δ ot
r) That Sam was working for the government, nobody could believe
s) Believe that Sam was working for the government, nobody (really) could
t) *Could believe that Sam was working for the government, nobody

Exercise 2.2
In §2.7, we showed how the relation c-command plays an important role in accounting for the use of reflexive and reciprocal anaphors. The same can be argued to be true of two other types of expression, namely non-anaphoric pronouns like he/him/her/it/them etc. and referential noun expressions like John or the president. Chomsky (1981) developed a Theory of Binding which incorporated the three binding principles outlined in a slightly revised form below:

(i) Binding Principles
Principle A: An anaphor must be bound within its local domain
Principle B: A (non-anaphoric) pronominal (expression) must be free within its local domain
Principle C: An R-expression (i.e. referring noun expression) must be free within the overall structure containing it

Although there is controversy about how best to define the notion of local domain in relation to binding, for present purposes assume that this corresponds to the notion of TP, and that the three binding principles in (i) thus amount to the following:

(ii) A: An anaphor (like himself) must be bound by (i.e. must refer to) a c-commanding constituent within the closest TP immediately containing it
B: A pronominal (like him) must not be bound by (i.e. must not refer to) any c-commanding constituent within the closest TP immediately containing it
C: An R-expression (i.e. a referring noun expression like John/the president) must not be coreferential to (i.e. must not refer to the same entity as) any c-commanding expression within the overall tree structure containing it

In the light of the Binding Principles outlined informally in (ii), discuss the binding properties of the expressions Fred, John, he/him and himself in sentences 1-5 below, drawing trees to represent the structure of the sentences.

1a The rumours about Fred have upset him  
   b *The rumours about Fred have upset himself
2a The rumours about him have upset Fred  
   b *The rumours about himself have upset Fred
3a John must feel that Fred has disgraced himself  
   b *John must feel that himself has disgraced Fred
4a John must feel that Fred has disgraced him  
   b John must feel that he has disgraced Fred
5a John may wonder if the rumours about Fred will affect him
b John may wonder if the rumours about him will affect Fred

6a John may suspect that Fred has taken some pictures of him
b John may suspect that Fred has taken some pictures of himself

In addition to its role in Binding Theory, the notion c-command has traditionally been assumed to play an important part in accounting for the syntax of so-called (negative/interrogative) polarity expressions – i.e. expressions which are said to be restricted to occurring in negative or interrogative contexts. One way of characterising this restriction is to suppose that the relevant expressions are restricted to occurring in a position where they are c-commanded by what Klima (1964) termed an affective constituent (e.g. a negative, interrogative or conditional expression – conditional expressions including if/unless in structures like ‘I will shut him up if he tries to say anything’). Polarity expressions include the partitive quantifier any (and related compounds like anyone/anything), the items need and dare when serving as auxiliaries which don’t take third person singular -s in the present tense and which have a bare (to-less) infinitive complement, and idioms like lift a finger. Show how the c-command condition accounts for the (un)grammaticality of the following:

7 You mustn’t talk to anyone
9 Who dare blame anyone?
6a John may wonder if the rumours about him will affect Fred
b John may wonder if the rumours about Fred will affect him
11 She should know if anyone has made any changes
13 He may have no desire to change anything
15 He may feel unable to do anything
17 *Anyone isn’t helping me
18 *The fact that nothing has happened will change anything
19 John will deny that anything has happened
20 *John has denied anything
21 John has denied any involvement
22 John has denied any involvement in any fraud

In relation to 17 (intended to be synonymous with There isn’t anyone helping me) show how the traditional ternary-branching analysis of clauses as S-constituents (whereby 17 would be analysed as an S constituent comprising the pronoun/PRN anyone, the present-tense auxiliary/T isn’t and the verb phrase/VP helping me) would be unable to provide a principled account of the ungrammaticality of 17 in terms of the c-command condition on polarity items. In relation to 19/20, consider why some linguists (e.g. Landau 2002) have claimed that it is not the verb deny which is negative in 19/20, but rather the complementiser that, and say why sentences like 21/22 cast doubt on this. Consider an alternative account of data like 19-22 under which we assume that a polarity item must be asymmetrically c-commanded by an affective item, and we define asymmetric c-command as follows:

(iii) X asymmetrically c-commands Y if X c-commands Y but Y does not c-command X

(A different approach to polarity items can be found in Acquaviva 2002.)

Helpful hints
Assume that need/dare (when they take a bare to-less infinitive complement) are modal auxiliaries which occupy the head T position of TP, and that they take a VP complement: assume also that they are polarity items in this use. Assume that no in 13/16 is a quantifier (= Q) which heads a quantifier phrase (= QP) constituent and has a noun phrase as its complement; assume that when the head Q of QP is negative, the overall QP is negative as well (because a phrase carries the same features as its head by virtue of being a projection of the relevant head). In addition, assume that mustn’t ‘idon’t isn’t are (inherently negative) \( \) T/tense auxiliaries. Finally, assume that anyone/anything/nobody/anything are pronouns (more specifically, they are Q-pronouns, i.e. pronominal quantifiers). [A descriptive detail which you might care to note is that the quantifier any has two uses. It can serve as a universal (or free choice) quantifier with a meaning similar to every (as in He’ll do anything for a laugh): in this use, the initial a of any is stressed, and the relevant word is not a polarity item – i.e. is not restricted to occurring in affective contexts. The second use of any is as a partitive (or existential) quantifier: in this use, it has a meaning similar to some and can be unstressed (with its initial vowel reduced to schwa or even being truncated in rapid colloquial speech styles – e.g. He wouldn’t do ’nything), and is indeed a polarity item restricted to occurring in affective contexts. Assume that in the examples in 7-22 above, you are dealing with partitive any, and that this is a polarity item.]
**Model answer for 1**

Although we will not attempt to argue this here, there are good reasons for thinking that sentence 1\(a\) has the structure (i) below:

\[
\begin{array}{c}
\text{(i)} \\
\text{TP} \\
\text{DP} \\
\text{D} \\
\text{The} \\
\text{N} \\
\text{rumours} \\
\text{P} \\
\text{about} \\
\text{NP} \\
\text{N} \\
\text{Fred} \\
\text{T} \\
\text{have} \\
\text{V} \\
\text{upset} \\
\text{PRN} \\
\text{him} \\
\end{array}
\]

*Him* is a pronominal (i.e. a non-anaphoric pronoun), and hence subject to Principle B of Binding Theory. This specifies that a pronominal like *him* cannot refer to any expression c-commanding it within the closest TP containing it; and from this it follows that such a pronominal can (a) refer to an expression contained in a different TP within the same sentence, or (b) refer to an expression within the same TP as long as that expression does not c-command *him*, or (c) refer to some entity in the domain of discourse (e.g. some person not mentioned in the relevant sentence, but present in the discourse context). The second of these possibilities (b) allows for *him* to refer to *Fred* in (i), since although *him* and *Fred* are contained within the same TP, *Fred* does not c-command *him* (the only constituent which *Fred* c-commands being the preposition *about*) so that principle B is satisfied if *him* refers to *Fred* (or if indeed *him* refers to some other person not mentioned in the sentence).

The noun *Fred* is an R-expression by virtue of being a referring noun expression, and hence is subject to Principle C of Binding Theory. This specifies that an R-expression like *Fred* cannot be coreferential to any expression which c-commands it anywhere within the overall structure containing it. However, there is no violation of Principle C in (i) if *Fred* and *him* are coreferential, since *Fred* is not c-commanded by *him*. (The only constituent which *him* c-commands is the V *upset*). There is likewise no violation of Principle C if *Fred* refers to some person not mentioned within the sentence. Overall, then, principles B and C allow for the twin possibilities that *him* can either refer to *Fred* or refer to someone other than Fred who is not directly mentioned in the sentence.

**Model answer for 7**

Given the assumptions made in the text, 7 will have the structure (ii) below:

\[
\begin{array}{c}
\text{(ii)} \\
\text{TP} \\
\text{PRN} \\
\text{You} \\
\text{T} \\
\text{mustn’t} \\
\text{V} \\
\text{talk} \\
\text{P} \\
\text{to} \\
\text{PRN} \\
\text{anyone} \\
\end{array}
\]

The T node containing the negative auxiliary *mustn’t* here c-commands the PRN node containing the polarity item *anyone* because the sister of [\(T \text{mustn’t}\)] is [\(VP \text{talk to anyone}\)], and *anyone* is contained within this VP, since the PRN node is one of the grandchildren of the VP node. If you prefer to use the alternative train metaphor suggested in §2.7 (under which X c-commands Y if you can get from X to Y on a train by going one stop north, then taking a southbound train on a different line and travelling as many stops south as you choose), you can say that [\(T \text{mustn’t}\)] c-commands [\(PRN \text{anyone}\)] because if you travel one stop north from the T station you arrive at the T-bar station, and if you then change trains at the T-bar station you can get a southbound train on a different line which will take you to the PRN station containing *anyone* (at the
end of the line) via the VP and PP stations. Since the polarity item *anyone* is c-commanded by the negative auxiliary *mustn’t*, the c-command condition on the use of polarity items is satisfied, and sentence 1 is therefore grammatical.
3

Null constituents

3.1 Overview
So far, our discussion of syntactic structure has tacitly assumed that all constituents in a given structure are overt (in the sense that they have audible phonetic features, as well as grammatical and semantic features). However, in this chapter we argue that syntactic structures may also contain null constituents (also known as empty categories) – i.e. constituents which have grammatical and semantic features but lack audible phonetic features (and so are ‘silent’ or ‘inaudible’).

3.2 Null subjects
We are already familiar with one kind of null constituent from the discussion of the Null Subject Parameter in §1.6. There, we saw that alongside finite clauses like that produced by SPEAKER A in the dialogue in (1) below with an overt subject like Maria, Italian also has finite clauses like that produced by SPEAKER B, with a null subject pronoun conventionally designated as pro (and referred to affectionately as ‘little pro’):

(1) SPEAKER A: Maria è tornata?
   Maria is returned? (‘Has Maria returned?’)
SPEAKER B: Sì, pro è tornata
   Yes, pro is returned (‘Yes, she has returned’)

One reason for positing pro in (1B) is that it captures the intuition that the sentence has an ‘understood’ subject (as is clear from the fact that its English translation contains the subject pronoun she). A second reason relates to the agreement morphology carried by the auxiliary è ‘is’ and the participle tornata ‘returned’ in (1). Just as the form of the (third person singular) auxiliary è ‘is’ and the (feminine singular) participle tornata is determined via agreement with the overt (third person feminine singular) subject Maria in (1A), so too the auxiliary and participle agree in exactly the same way with the null pro subject in (1B), which (as used here) is third person feminine singular by virtue of referring to Maria. If the sentence in (1B) were subjectless, it is not obvious how we would account for the relevant agreement facts. Since all finite clauses in Italian allow a null pro subject, we can refer to pro as a finite null subject.

Although English is not an Italian-style null subject language (in the sense that it is not a language which allows any and every kind of finite clause to have a null pro subject), it does have three different types of null subject (briefly discussed in exercise 1.1). As the examples in (2) below illustrate, an imperative sentence in English can have an overt subject which is either a second person expression like you, or a third person expression like anyone:

(2) (a) Don’t you lose your nerve!                        (b) Don’t anyone lose their nerve!

However, English also allows an imperative null subject in imperative sentences like (3a) below, and these are intrinsically second person – as the contrast with (3b) illustrates:

(3) (a) Don’t lose your nerve!                        (b) *Don’t lose anyone!

In other words, imperative null subjects seem to be a silent counterpart of you. One way of describing this is to say that the pronoun you can have a null spellout (and thereby have its phonetic features not spelled out – i.e. deleted/omitted) when it is the subject of an imperative sentence.

English also has a second kind of null subject which we will call truncated null subjects. In informal styles of spoken English (and also in diary styles of written English) a sentence can be truncated (i.e. shortened) by giving a subject pronoun like I/you/he/we/they a null spellout if it is the first word in a sentence, and if it is weak (i.e. unstressed/non-contrastive). So, in sentences like those in (4) below:

(4) (a) I can’t find my pen         (b) I think I left it at home         (c) Why do I always lose things?

the two italicised occurrences of the subject pronoun I can be given a null spellout because in each case I is the first word in the sentence, but not other occurrences of I – as we see from (5) below:
(5)(a) Can’t find my pen  (b) Think I left it at home/*Think left it at home
(c) *Why do always lose things?

However, not all sentence-initial subjects can be truncated (e.g. we can’t readily truncate He in a sentence like He is tired, giving *Is tired); the precise nature of the constraints on truncation are unclear.

A third type of null subject found in English is a nonfinite null subject, found in nonfinite clauses which don’t have an overt subject. In this connection, compare the structure of the bracketed infinitive clauses in the (a) and (b) examples below:

(6)(a) We would like [you to stay]  (7)(a) We don’t want [anyone to upset them]
(b) We would like [to stay]  (b) We don’t want [to upset them]

Each of the bracketed infinitive complement clauses in the (a) examples in (6) and (7) contains an overt (italicised) subject. By contrast, the bracketed complement clauses in the (b) examples appear to be subjectless. However, we shall argue that apparently subjectless infinitive clauses contain a null subject.

The particular kind of null subject found in the bracketed clauses in the (b) examples has the same grammatical and referential properties as a pronoun, and hence appears to be a null pronoun. In order to differentiate it from the null (‘little pro’) subject found in finite clauses in null subject languages like Italian, it is conventionally designated as PRO and referred to as ‘big PRO’. Given this assumption, a sentence such as (6b) will have a parallel structure to (6a), except that the bracketed TP has an overt pronoun you as its subject in (6a), but a null pronoun PRO as its subject in (6b) – as shown below:

(8)

Using the relevant technical terminology, we can say that the null PRO subject in (8) is controlled by (i.e. refers back to) the subject we of the matrix (= containing = next highest) clause – or, equivalently, that we is the controller or antecedent of PRO: hence, a structure like ‘We would like PRO to stay’ has an interpretation akin to that of ‘We would like ourselves to stay’. Verbs (such as like) which allow an infinitive complement with a PRO subject are said to function (in the relevant use) as control verbs; likewise, a complement clause with a null PRO subject is known as a control clause.

An obvious question to ask at this juncture is why we should posit that apparently subjectless infinitive complements like those bracketed in (6b, 7b) above have a null PRO subject. Part of the motivation comes from the intuition that the verb stay in (6b) above has an understood subject – and positing a PRO subject for the stay clause captures this intuition. The null PRO subject of a control infinitive becomes overt if the infinitive clause is substituted by a finite clause, as we see from the paraphrases for the (a) examples given in the corresponding (b) examples below:

(9)(a) I am sorry [PRO to have kept you waiting]  (b) I am sorry [I have kept you waiting]
(10)(a) Jim promised [PRO to come to my party]  (b) Jim promised [he would come to my party]

The fact that the bracketed clauses in the (b) examples contain an overt (italicised) subject makes it plausible to suppose that the bracketed clauses in the synonymous (a) examples have a null PRO subject. (Note, however, that only verbs which select both an infinitive complement and a finite complement allow a control clause to be substituted by a finite clause with an overt subject – hence, not a control verb like want in I want to go home because want does not allow a that-clause complement, as we see from the ungrammaticality of *I want that I should leave. Interestingly, Xu 2003 claims that all control clauses in Chinese allow an overt subject pronoun in place of PRO.)
Further evidence in support of positing a null PRO subject in such clauses comes from the syntax of **reflexive anaphors** (i.e. *self*/selves forms such as *myself*/yourself/himself/themselves etc.). As examples such as the following indicate, reflexives generally require a **local antecedent** (the reflexive being italicised and its antecedent bold-printed):

(11)(a) They want [John to help *himself*]  
(b) *They* want [John to help themselves]

In the case of structures like (11), a local antecedent means ‘an antecedent contained within the same [bracketed] clause/TP as the reflexive’. (11a) is grammatical because it satisfies this locality requirement: the antecedent of the reflexive *himself* is the noun John, and John is contained within the same (bracketed) help-clause as *himself*. By contrast, (11b) is ungrammatical because the reflexive *themselves* does not have a local antecedent (i.e. it does not have an antecedent within the bracketed clause containing it); its antecedent is the pronoun *they*, and *they* is contained within the *want* clause, not within the [bracketed] help clause. In the light of the requirement for reflexives to have a local antecedent, consider now how we account for the grammaticality of the following:

(12) John wants [PRO to prove himself]

Given the requirement for reflexives to have a local antecedent, it follows that the reflexive *himself* must have an antecedent within its own [bracketed] clause. This requirement is satisfied in (12) if we assume that the bracketed complement clause has a PRO subject, and that PRO is the antecedent of *himself*. Since PRO in turn is controlled by John (i.e. John is the antecedent of PRO), this means that *himself* is **coreferential** to (i.e. refers to the same individual as) John. In a sentence like (12), PRO has a single antecedent (namely John). But in a sentence such as the following (from Landau 2006, p.156):

(13) Mary proposed to Paul [PRO to become partners]

PRO has a **split antecedent**, in the sense that Mary and Paul are the joint antecedents of PRO (and indeed the pronoun *they* can have the same split antecedent interpretation in a sentence such as *Mary proposed to Paul that they should become partners*).

We can formulate a further argument in support of positing a PRO subject in apparently subjectless infinitive clauses in relation to the syntax of **predicate nominals**: these are nominal (i.e. noun-containing) expressions used as the complement of a copular (i.e. linking) verb such as *be, become, remain* (etc.) in expressions such as *John was/became/remained my best friend*, where the predicate nominal is *my best friend*, and the property of *being/becoming/remaining my best friend* is **predicated** of John. Predicate nominals of the relevant type have to agree in number with the subject of their own clause in copular constructions, as we see from examples such as the following:

(14)(a) They want [their son to become a millionaire/*millionaires*]  
(b) He wants [his sons to become millionaires/*a millionaire*]

The italicised predicate nominal has to agree with the (bold-printed) subject of its own [bracketed] become clause, and cannot agree with the subject of the *want* clause. In the light of this local (clause-internal) agreement requirement, consider now how we account for the agreement pattern in (15) below:

(15)(a) They want [PRO to become millionaires/*a millionaire*]  
(b) He wants [PRO to become a millionaire/*millionaires*]

If we posit that the *become* clause has a PRO subject which is controlled by (i.e. refers back to) the subject of the *want* clause, the relevant agreement facts can be accounted for straightforwardly: we simply posit that the predicate nominal *(a) millionaire(s)* agrees with PRO (since PRO is the subject of the *become* clause), and that PRO in (15a) is plural because its controller/antecedent is the plural pronoun *they*, and conversely that PRO in (15b) is singular because its antecedent/controller is the singular pronoun *he*.

A different kind of argument in support of positing that control clauses have a silent PRO subject can be formulated in theoretical terms. In the previous chapter, we noted that T-auxiliaries like *will* have an EPP feature which requires them to project a subject on the edge of TP. However, since we argued in chapter 1 that infinitival *to* also belongs to the category T (by virtue of its status as an infinitival Tense particle), we can suggest the broader generalisation that all T-constituents have an EPP feature requiring them to project a subject on the edge of TP – not only T-auxiliaries like *will* but also the infinitival...
T-constituent to. The analysis in (8) above is consistent with this generalisation, since it posits that the stay clause either has an overt you subject or a null PRO subject, with either type of subject satisfying the EPP feature of to.

The overall conclusion which our discussion here leads us to is that just as infinitive complements like you to stay in (6a) have an overt subject (you), so too seemingly subjectless infinitive complements like to stay in (6b) have a null PRO subject – as shown in (8) above. In structures like (8), PRO has an explicit controller, which is the subject of the matrix clause (i.e. of the clause which immediately contains the control verb). However, this is not always the case, as we can see from structures like those below:

(16)(a) It is essential [PRO to take regular exercise]
(b) It’s unwise [PRO to mix business with pleasure]
(c) It’s vital [PRO to prepare myself properly for the exam]
(d) It’s important [PRO not to take oneself too seriously]

It is clear from examples like (16c, d) above that the bracketed complement clauses must have a null PRO subject, because the reflexives myself/oneself require a local antecedent within the bracketed clause containing them, and PRO serves the function of being the antecedent of the reflexive. However, PRO itself has no explicit antecedent in structures like (16). In such cases (where PRO lacks an explicit controller), PRO can either refer to some individual outside the sentence (e.g. the speaker in 16a, c) or can have arbitrary reference (as in 16b, d) and refer to ‘any arbitrary person you care to mention’ and hence have much the same interpretation as arbitrary one in sentences like ‘One can’t be too careful these days’. (See Landau 1999, 2001, 2003, 2004, 2006 for further discussion of control structures.)

3.3 Null auxiliaries

So far, all the clauses we have looked at in this chapter and the last have contained a TP projection headed by a finite auxiliary or infinitival to. The obvious generalisation suggested by this is that all clauses contain TP. An important question begged by this assumption, however, is how we are to analyse finite clauses which contain no overt auxiliary. In this connection, consider the structure below:

(17) He could have helped her, or [she have helped him]

Both clauses here (viz. the he clause and the bracketed she clause) appear to be finite, since both have nominative subjects (he/she). If all finite clauses contain a TP projection headed by a finite T constituent, it follows that both clauses in (17) must be TPs containing a finite T. This is clearly true of the he clause, since this contains the finite modal auxiliary could; however, the she clause doesn’t seem to contain any finite auxiliary constituent, since have is an infinitive form in (17) (the corresponding finite form which would be required with a third person subject like she being has). How can we analyse finite clauses as projections of a finite T constituent when clauses like that bracketed in (17) contain no finite auxiliary?

An intuitively plausible answer is to suppose that the string she have helped him in (17) is an elliptical (i.e. abbreviated) variant of she could have helped him, and that the T constituent could in the second clause undergoes a particular form of ellipsis called gapping. (Gapping is a grammatical operation by which the head of a phrase is given a null spellout – and so has its phonetic features deleted – when the same item occurs elsewhere within the sentence, and is so called because it leaves an apparent ‘gap’ in the phrase where the head would otherwise have been.) If so, the second clause will have the structure shown below (where could marks an ellipsed counterpart of could, and we assume that a non-finite auxiliary like have occupies the head AUX/Auxiliary position of an AUXP/Auxiliary Phrase: see §4.7 on AUXP):

(18)
The head T position of TP in a structure like (18) is filled by the ellipsed auxiliary *could*. Although an ellipsed item loses its phonetic features, it retains its grammatical and semantic features, so that *could* in (18) is a silent counterpart of *could*. The null T analysis in (18) provides a principled account of three observations. Firstly, the bracketed clause in (17) is interpreted as an elliptical form of *she could have helped him*: this can be straightforwardly accounted for under the analysis in (18) since T contains a null counterpart of *could*. Secondly, the subject is in the nominative case form *she*: this can be attributed to the fact that the T position in (18) is filled by a ‘silent’ counterpart of the finite auxiliary *could*, which (like other finite auxiliaries) requires a nominative subject. Thirdly, the perfect auxiliary *have* is in the infinitive form: this is because *could* (being a null copy of *could*) has the same selectional properties as *could*, and so (like *could*) selects a complement headed by an item (like *have*) in the infinitive form.

A further argument in support of the null T analysis in (18) comes from facts relating to cliticisation (a process by which one word attaches itself in a leech-like fashion to another). The perfect auxiliary *have* has a range of variant forms in the spoken language. When unstressed, it can lose its initial /h/ segment and have its vowel reduced to schwa /ə/, and so be pronounced as /əv/ e.g. in sentences such as *You should have been there*. (Because of is also pronounced /əv/ when unstressed, some people mistakenly write this as *You should of been there* – not *you*, of course!) However, when *have* is used with a pronominal subject ending in a vowel or diphthong (e.g. a pronoun like *I/we/you/they*), it can lose its vowel entirely and be contracted down to /v/; in this weak form, it is phonetically too insubstantial to survive as an independent word and encliticises onto (i.e. attaches to the end of) its subject, resulting in structures such as:

(19)

(a) You’ve done your duty
(b) They’ve retired General Gaga
(c) I’ve forgotten to lock the door
(d) We’ve saved you a place

However, note that *have* cannot cliticise onto *she* in (18) below:

(20)  *He could have helped her or she’ve helped him*

so that *she’ve* is not homophonous with the invented word *sheve*. Why should cliticisation of *have* onto *she* be blocked here? Let’s suppose that *have*-cliticisation is subject to the following structural conditions:

(21)

Have can encliticise onto a pronoun ending in a vowel or diphthong provided that

(i) the pronoun asymmetrically c-commands *have* (i.e. the pronoun c-commands *have* but is not itself c-commanded by *have*)

(ii) the two are immediately adjacent, in the sense that there is no constituent intervening between the two (i.e. no constituent which c-commands *have* and which is in turn c-commanded by the pronoun)

The asymmetric c-command condition (21i) in effect requires the pronoun to be ‘higher up’ in the structure than *have*. (In the relevant technical sense, one constituent X asymmetrically c-commands another constituent Y if X c-commands Y, but Y does not c-command X: see (iii) in exercise 2.2.) The adjacency condition (21ii) requires *have* to be immediately adjacent to the pronoun which it cliticises to. (A descriptive detail which we set aside here is that (21) applies specifically to encliticisation of *have*: encliticisation of the ‘s variant of *has* is subject to far less restrictive conditions on its use – but this will not be pursued here.)

To see how (21) works, consider the structure below:

(22)

PRN
They

TP

T

have

V

left

Here, the pronoun *they* ends in a diphthong and so is the kind of pronoun that *have* can cliticise onto. The asymmetric c-command condition (21i) is met in that *they* c-commands *have*, but *have* does not c-command *they*. The adjacency condition (21ii) is also met in that there is no constituent intervening between *they* and *have*. Since both its structural conditions are met, (21) correctly predicts that *have* can encliticise onto *they*, so deriving *They’ve left*. The kind of cliticisation involved here is essentially phonological (rather than syntactic), so that *they* and *have* remain separate words in the syntax, but are
fused together in the PF component (i.e. the component responsible for determining Phonetic Form) once the structure generated (i.e. formed) by the syntax has been handed over to the PF component for morphological and phonological processing.

In the light of our discussion of have cliticisation, now consider why cliticisation of have onto she is not possible in (20) *He could have helped her or she’ve helped him. Under the null T analysis suggested above, the second clause in (20) contains a null variant of could and has the structure shown in (18) above, repeated as (23) below:

(23)

```
TP
  PRN she
  T could
  AUXP
    AUX have
    VP
      V helped
      PRN him
```

Although the asymmetric c-command condition (21i) is met in (23) in that she c-commands but is not c-commanded by have, the adjacency condition (21ii) is not met in that she is not immediately adjacent to have because the null auxiliary could intervenes between the two (in the sense that could c-commands have, and could is in turn c-commanded by she). Thus, the presence of the intervening null auxiliary could blocks cliticisation of have onto she in (23), thereby accounting for the ungrammaticality of (20) *He could have helped her or she’ve helped him. Turning this conclusion on its head, we can say that the ungrammaticality of (20) provides us with empirical evidence that the bracketed clause in (17) contains a null counterpart of could intervening between she and have – as is claimed in the analysis in (23) above.

Our discussion so far in this section has suggested that some seemingly auxiliariless clauses are TPs headed by a T containing an auxiliary which (via ellipsis) is given a null phonetic spellout. A rather different kind of null auxiliary structure is found in African American English (AAE), in sentences such as the following (from Labov 1969, p. 717):

(24) He just feel like he gettin´ cripple up from arthritis

In AAE, specific forms of the auxiliary BE have null variants, so that we find null forms of are and is in contexts where Standard English (SE) would require the contracted forms ’s and ’re. Hence, in place of SE He’s getting crippled we find AAE He gettin cripple (with a null counterpart of ’s). Evidence in support of the assumption that AAE sentences like (24) incorporate a null variant of is comes from the fact that the missing auxiliary is may surface in a tag, as in sentences such as the following (where the sequence following the comma is the tag):

(25) He gonna be there, I know he is (Fasold 1980, p.29)

In tag sentences, the auxiliary found in the tag is a copy of the auxiliary used in the main clause. This being so, it follows that the main gonna clause in (25) must contain a null variant of the progressive auxiliary is. In other words, the main clause in (25) must be a TP with the structure shown in skeletal form in (26) below (strikethrough indicating that the phonetic features of the auxiliary are not spelled out):

(26) [TP He [t is] gonna be there]

Interestingly, the form am (contracted to ’m) has no null counterpart in AAE, nor do the past tense forms was/were. It would seem, therefore, that the only finite forms of BE which have a null counterpart in AAE are the specific auxiliary forms are and is. No less interestingly, Wolfram (1971, p. 149) reports that in nonstandard Southern White American English the use of null auxiliaries is even more restricted, and that the only form of BE with a null counterpart is are; cf. the parallel observation by Fasold (1980: 30) that ‘There are many southern whites who delete only are’).
3.4 Null T in auxiliariless finite clauses

Our analysis of the kind of auxiliariless clauses discussed in §3.3 as TPs headed by a T which has a null phonetic spellout suggests the more general hypothesis that:

(27) All finite clauses are TPs headed by an (overt or null) T constituent

Such a hypothesis has interesting implications for finite clauses such as the following which contain a finite verb but no auxiliary:

(28)(a) He enjoys syntax              (b) He enjoyed syntax

It implies that we should analyse auxiliariless finite clauses like those in (28a/b) above as TP constituents which have the respective structures shown in (29a/b) below:

(29)(a)                TP                           (b)                      TP

PRN                      T                                      PRN
He                                                                 He
T                      VP                                                          T
V                  N                                                                V                  N
enjoys           syntax                                                       enjoyed           syntax

Structures like those in (29) would differ from null-auxiliary structures like (23) He could have helped her or she could have helped him and (26) He is gonna be there in that they don’t contain a silent counterpart of a specific auxiliary like could or is, but rather simply don’t contain any auxiliary at all.

However, there’s clearly something very odd about a null T analysis like (29) if we say that the relevant clauses are TPs which are headed by a T constituent which contains absolutely nothing. For one thing, a category label like T is an abbreviation for a set of features carried by a lexical item – hence, if we posit that structures like (29) are TPs, the head T position of TP has to be occupied by some kind of lexical item. Moreover, the structures which are generated by the syntactic component of the grammar are eventually handed over to the semantic component to be assigned a semantic interpretation, and it seems reasonable to follow Chomsky (1995) in requiring all heads in a syntactic structure to play a role in determining the meaning of the overall structure. If so, it clearly has to be the case that the head T of TP contains some item which contributes in some way to the semantic interpretation of the sentence. But what kind of item could T contain?

In order to try and answer this question, it’s instructive to contrast auxiliariless structures like those in (29) above with auxiliary-containing structures like those in (30) below:

(30)(a)                TP                           (b)                      TP

PRN                      T                                      PRN
He                                                                 He
T                      VP                                                          T
V                  N                                                                V                  N
does                                                                                  did
enjoy           syntax                                                         enjoy            syntax

The head T position in TP is occupied by the present-tense auxiliary does in (30a), and by the past tense auxiliary did in (30b). If we examine the internal morphological structure of these two words, we see that does contains the present tense affix -s, and that did contains the past tense affix -d (each of these affixes being attached to an irregular stem form of the auxiliary DO). In schematic terms, then, we can say that the head T constituent of TP in structures like (30) is of the form auxiliary stem+tense affix.

If we now look back at the auxiliariless structures in (29), we see that the head V position of VP in these structures is occupied by the verbs enjoys and enjoyed, and that these have a parallel morphological structure, in that they are of the form verb stem+tense affix. So, what finite clauses like (29) and (30) share in common is that in both cases they contain an (auxiliary or main) verb carrying a tense affix. In structures like (30) which contain an auxiliary like DO, the tense affix is attached to the auxiliary; in structures like (29) which contain no auxiliary, the tense affix attaches instead to the main verb enjoy. If
we make the reasonable assumption that (as its label suggests) T is the **locus** of the tense properties of a finite clause (in the sense that T is the constituent which carries its tense features), an interesting possibility to consider is that the relevant tense affix (in both types of clause structure) originates in the head T position of TP. Since tensed verbs agree with their subjects in person and number, let us suppose that the Tense affix (below abbreviated to \(Af\)) also carries person and number features. On this view, sentences like *He does enjoy syntax* and *He enjoys syntax* would have the respective syntactic structures indicated in (31a/b) below, where \([3SgPr]\) is an abbreviation for the features [third-person, singular-number, present-tense]:

![Diagram](image)

The two structures share in common the fact that they both contain a tense affix (\(Af\)) in T; they differ in that the tense affix is attached to the auxiliary DO in (31a), but is unattached in (31b) because there is no auxiliary in T for the affix to attach to.

Under the analysis in (31), it is clear that T in auxiliariless clauses like (31b) would not be empty, but rather would contain a tense/agreement affix whose semantic contribution to the meaning of the overall sentence is that it marks tense. But what about the phonetic spellout of the Tense affix? In a structure like (31a), it is easy to see why the (third person singular present) Tense affix is ultimately spelled out as an *s*-inflection on the end of the auxiliary *does*, because the affix is directly attached to the auxiliary DO in T. But how come the affix ends up spelled out as an *s*-inflection on the main verb *enjoys* in a structure like (31b)? We can answer this question in the following terms. Once the syntax has formed a clause structure like (31), the relevant syntactic structure is then sent to the **semantic component** to be assigned a semantic interpretation, and to the **PF component** to be assigned a phonetic form. In the PF component, a number of morphological and phonological operations apply. One of these morphological operations is traditionally referred to as **Affix Hopping**, and can be characterised informally as follows:

(32) **Affix Hopping**

When some constituent C contains an unattached affix \(Af\), in the PF component \(Af\) is lowered onto the head H of the complement of C (provided H is an appropriate **host** for the affix to attach to).

Since the Affix is in T in (31b), and since the complement of T is the VP *enjoy syntax*, (32) means that the affix in T will be lowered onto the head V *enjoy* of the relevant VP – provided that V is an appropriate kind of host for the affix. But since the affix in T is a tense affix which needs to attach to a verbal host, it is clear that the verb *enjoy* is indeed an appropriate host for the tense affix. Accordingly, in the PF component the unattached affix in T in (31b) will be lowered onto the verb *enjoy* via the morphological operation of Affix Hopping (32), in the manner shown by the arrow in (33) below:

![Diagram](image)

Since inflections in English are **suffixes**, we can assume that the Tense affix will be lowered onto the end of the verb *enjoy*, to derive the structure \([enjoy+Af_{3SgPr}]\). Given that *enjoy* is a regular verb, the resulting
structure will ultimately be spelled out in the phonology as the form *enjoys*.

What we have done so far in this section is sketch out an analysis of auxiliariless finite clauses as TP headed by a T constituent containing an abstract Tense affix which is subsequently lowered onto the verb by an Affix Hopping operation in the PF component (so resulting in a clause structure which looks as if it contains no T constituent). However, an important question to ask at this juncture is why we should claim that auxiliariless clauses contain an abstract T constituent. From a theoretical point of view, one advantage of the abstract T analysis is that it provides a unitary characterisation of the syntax of clauses, since it allows us to say that all clauses contain a TP projection, that the subject of a clause is always in spec-TP (i.e. always occupies the specifier position within TP), that a finite clause always contains an (auxiliary or main) verb carrying a tense affix, and so on. Lending further weight to theory-internal considerations such as these is a substantial body of empirical evidence, as we shall see.

One argument in support of the Tense Affix analysis comes from coordination facts in relation to sentences such as:

(34)(a) He *enjoys syntax, and has learned a lot
(b) He *enjoyed syntax, and is taking a follow-up course

In both sentences, the italicised string *enjoys syntax/enjoyed syntax* has been co-ordinated with a bold-printed constituent which is clearly a T-bar in that it comprises a present-tense auxiliary (*has/is*) with a verb phrase complement (*learned a lot/taking a follow-up course*). On the assumption that only the same kinds of constituent can be conjoined by *and*, it follows that the italicised (seemingly T-less) strings *enjoys syntax/enjoyed syntax* must also be T-bar constituents; and since they contain no overt auxiliary, this means they must contain an abstract T constituent of some kind – precisely as the Tense Affix analysis in (33) claims.

A direct consequence of the Tense Affix analysis (33) of auxiliariless finite clauses is that finite auxiliaries and finite main verbs occupy different positions within the clause: finite auxiliaries occupy the head T position of TP, whereas finite main verbs occupy the head V position of VP. An interesting way of testing this hypothesis is in relation to the behaviour of items which have the status of auxiliaries in some uses, but of verbs in others. One such word is HAVE. In the kind of uses illustrated in (35) below, HAVE is a perfect auxiliary (and so requires the main verb to be in the perfect participle form *seen/ been*):

(35)(a) They *have seen the ghost
(b) They *had been warned about the ghost

However, in the uses illustrated in (36) below, HAVE is causative or experiential in sense (and so has much the same meaning as cause or experience):

(36)(a) The doctor *had an eye-specialist examine the patient
(b) The doctor *had the patient examined by an eye-specialist
(c) The teacher *had three students walk out on her
(d) I’ve never *had anyone send me flowers

By traditional tests of auxiliarhood, perfect have is an auxiliary, and causative/experiential have is a main verb: e.g. perfect have can undergo inversion (*Has she gone to Paris?*) whereas causative/experiential have cannot (*Had the doctor an eye specialist examine the patient?*). In terms of the assumptions we are making here, this means that finite forms of HAVE are positioned in the head T position of TP in their perfect use, but in the head V position of VP in their causative or experiential use.

Evidence in support of this claim comes from cliticisation. We noted earlier in (21) above that the form have can cliticise onto an immediately adjacent pronoun ending in a vowel/diphthong which asymmetrically c-commands have. In the light of this, consider contrasts such as the following:

(37)(a) *They’ve seen a ghost (= perfect have)
(b) *They’ve their car serviced regularly (= causative have).
(c) *They’ve students walk out on them sometimes (= experiential have)

How can we account for this contrast? If we assume that perfect have in (37a) is a finite (present tense) auxiliary which occupies the head T position of TP, but that causative have in (37b) and experiential have in (37c) are main verbs occupying the head V position of a VP complement of a null T, then prior to cliticisation the three clauses will have the respective simplified structures indicated by the partial labeled bracketings in (38a-c) below (where Af is an abstract Tense affix):
structures indicated in (40a, b) below: clauses contain a TP constituent, the main clauses in (39a, b) will have the respective (simplified)
abstract, we will generally show auxiliaries and verbs in their orthographic form – as indeed we did in (40)
(b) Jules has his hair styled by Quentin Quiff,
(c) [TP They [\text{\_AF}] [VP \_V] students walk out on them sometimes]

(Here and throughout the rest of the book, \textit{partial} labelled bracketings are used to show those parts of the
structure most relevant to the discussion at hand, omitting other parts. In such cases, we generally show
relevant heads and their maximal projections but omit intermediate projections, as in (38) above where we show e.g. T and TP but not T-bar.) Since we claimed in (21) above that cliticisation of \textit{have} onto a
pronoun is blocked by the presence of an intervening constituent, it should be obvious why \textit{have} can
criticise onto \textit{they} in (38a) but not in (38b, c): after all, there is no intervening constituent separating the
pronoun \textit{they} from \textit{have} in (38a), but \textit{they} is separated from the verb \textit{have} in (38b, c) by an intervening T
constituent containing a Tense affix (\textit{Af}), so blocking contraction. It goes without saying that a crucial
premise of this account is the assumption that (in its finite forms) \textit{have} is positioned in the head T position
of TP in its use as a perfect auxiliary, but in the head V position of VP in its use as a causative or
experiential verb. In other words, \textit{have} cliticisation facts suggest that finite clauses which lack a finite
auxiliary are TPs headed by an abstract T constituent containing a Tense affix.

A further piece of empirical evidence in support of the TP analysis comes from \textbf{tag questions}. As we
see from the examples below, sentences containing (a finite form of) perfect \textit{have} are tagged by \textit{have},
whereas sentences containing (a finite form of) causative \textit{have} are tagged by \textit{do}:

(39)(a) Mary \textit{has} gone to Paris, \textit{has}*\textit{does} she?
(b) Jules \textit{has} his hair styled by Quentin Quiff, \textit{does}*\textit{has} he?

Given the T-analysis of perfect \textit{have} and the V-analysis of causative \textit{have} and the assumption that all
clauses contain a TP constituent, the main clauses in (39a, b) will have the respective (simplified)
structures indicated in (40a, b) below:

(40)(a) [TP Mary [\text{\_V}] [VP \_V] to Paris]
(b) [TP Jules [\text{\_AF}] [VP \_V] his hair styled by Quentin Quiff]

(A complication which we overlook here and throughout is that \textit{HAVE} will only be spelled out as the form
\textit{has} in the PF component, and hence should more properly be represented as the abstract item \textit{HAVE} in the
syntax. Similar considerations naturally apply to other items, but we set this aside here in order to simplify
exposition.) If we assume that the T constituent which appears in the tag must be a copy of the T
constituent in the main clause, the contrast in (39) can be accounted for in a principled fashion. In (40a),
the head T position of TP is filled by the auxiliary \textit{has}, and so the tag contains a copy of \textit{has}. In (40b),
however, T contains only an abstract tense affix, hence we would expect the tag to contain a copy of this
affix. Now, in the main clause, the affix can be lowered from T onto the verb \textit{have} in the head V position
of VP, with the resulting verb eventually being spelled out as \textit{has}. But in the tag, there is no verb for the
affix to be lowered onto. Accordingly, \textit{DO}-support is used in the tag. More generally, we can suppose that a
tense affix attached to an auxiliary or main verb stem is spelled out as an appropriately inflected form of
the auxiliary/verb in question (so that when the tense affix attaches onto \textit{HAVE} in the main clause in (40b),
the resulting \textit{HAVE}+\textit{AFFIX} substructure is spelled out as \textit{has}); by contrast, an unattached tense affix is
spelled out as an appropriately inflected form of \textit{DO} (so that the tense affix in the tag in (39b) is spelled out as
\textit{does} because there is no verbal stem beneath the affix for it to attach to).

In this section, we have argued that a finite T always contains a tense affix. In clauses containing an
auxiliary, the auxiliary is directly merged with the tense affix to form an \textit{auxiliary}+\textit{affix} structure; in
auxiliariless clauses, the tense affix is lowered onto the main verb by an \textit{Affix Hopping} operation in the
PF component, so forming a \textit{verb}+\textit{affix} structure. When an affix is stranded with no verbal stem to attach
to, it it spelled out as an inflected form of \textit{DO}. However, in order to avoid our exposition becoming too
abstract, we will generally show auxiliaries and verbs in their orthographic form – as indeed we did in (40)
above, where the relevant form of the word \textit{HAVE} was represented as \textit{has} rather than as [\textit{HAVE}+\textit{Affix}_{3SgPr}].
3.5 Null T in bare infinitive clauses

In the previous section, we argued that auxiliariless finite clauses are TP constituents headed by an abstract T containing a Tense affix. Given that clauses containing a finite auxiliary are also TPs, a plausible conclusion to draw is that all finite clauses are TPs. Since to infinitival clauses are also TPs (with to serving as a nonfinite tense particle) we can generalise still further and say that all finite and infinitival clauses are TPs. This in turn has implications for how we analyse bare (i.e. to-less) infinitive complement clauses such as those bracketed below (where the italicised verb is infinitival in form):

(41)(a) I have never known [Tom criticise anyone]
(b) A reporter saw [Senator Sleaze leave Benny’s Bunny Bar]
(c) You mustn’t let [the pressure get to you]

If (as we are suggesting) all finite and infinitival clauses are indeed TPs, bare infinitive clauses like those bracketed in (41) will be TPs headed by a null T constituent. Since the relevant null T constituent resembles infinitival to in requiring the (italicised) verb in the bracketed complement clause to be in the infinitive form, we can take it to be a null counterpart of infinitival to (below symbolised as \( \Theta \)). This in turn will mean that the bracketed infinitive clause in (41a) has the structure (42) below:

(42) TP
    N
    Tom
    T'
    T
    VP
    to
    V
    PRN
    criticise
    anyone

We could then say that verbs like know, see and let (as used in (41) above) take an infinitival TP complement headed by an infinitive particle with a null spellout, whereas verbs like expect, judge, report, believe etc. take a TP complement headed by an infinitive particle which is overtly spelled out as to in structures like those below:

(43)(a) I expect [him to win]
(b) I judged [him to be lying]
(c) They reported [him to be missing]
(d) I believe [him to be innocent]

This means that all infinitive clauses are TPs headed by an infinitival T which is overtly spelled out as to in infinitive clauses like those bracketed in (43), but which has a null spellout in infinitive clauses like those bracketed in (41).

From a historical perspective, the null infinitive particle analysis is far from implausible since many bare infinitive clauses in present-day English had to infinitive counterparts in earlier varieties of English – as is illustrated by the following Shakespearean examples:

(44)(a) I saw [her coral lips to move] (Lucentio, Taming of the Shrew, I.i)
(b) My lord your son made [me to think of this] (Helena, All’s Well That Ends Well, I.iii)
(c) What would you have [me to do]? (Lafeu, All’s Well That Ends Well, V.ii)
(d) I had rather hear [you to solicit that] (Olivia, All’s Well That Ends Well, III.i)

Moreover, some bare infinitive clauses have to infinitive counterparts in present-day English: cf.

(45)(a) I’ve never known [Tom (to) criticise anyone]
(b) Tom has never been known [to criticise anyone]
(46)(a) A reporter saw [Senator Sleaze leave Benny’s Bunny Bar]
(b) Senator Sleaze was seen [to leave Benny’s Bunny Bar]

The infinitive particle which heads the bracketed infinitival TP in sentences like (45/46) must be overtly spelled out as to when the relevant TP is used as the complement of a passive participle like known in (45b) or seen in (46b), but can have a null spellout when the relevant TP is the complement of an active transitive verb like the perfect participle known in (45a) or the past tense form saw in (46a) – a key difference being that a null spellout for the infinitive particle is optional in structures like (45a) but obligatory in structures like (46a). However, occasional ‘slips of the tongue’ can result in the infinitive
particle sometimes even being overt even in active structures like (46) – as we see from the following sentence produced by a BBC TV newscaster:

(47) The Mayor of New Orleans would like to see parts of the city which were devastated in the hurricane to get back to normal.

Although data like (44-47) are suggestive rather than conclusive, they make it plausible to suppose that bare infinitive clauses are TPs headed by a null variant of infinitival to.

Additional support for the null infinitive particle analysis of bare infinitive clauses comes from cliticisation facts in relation to sentences such as the following:

(48)(a) I can’t let [you have my password]
(b) *I can’t let [you’ve my password]

If we suppose that the bracketed infinitive complement in (48b) is a TP headed by a null variant of infinitival to as in:

(49) I can’t let [TP you [T to] have my password]

we can account for the fact that have cannot cliticise onto you by positing that the presence of the null infinitive particle to intervening between you and have blocks cliticisation of have onto you.

A further argument leading to the same conclusion comes from structures like:

(50)(a) Let [there be peace]
(b) I’ve never known [there be complaints about syntax]

It has been argued by Safir (1993) that the pronoun there (in this use as an expletive pronoun) is restricted to occurring in the specifier/subject position within TP. Such a restriction would account for contrasts like:

(51)(a) I consider [there to be an economic crisis]
(b) *I consider [there an economic crisis]

since the first bracketed complement is a TP headed by infinitival to, and the second is a type of verbless clause sometimes referred to as a small clause which appears not to be headed by T (since it contains no auxiliary or infinitival to, and no VP). If expletive there can only occur in spec-TP, it follows that the bracketed infinitive complement clauses in (50) must be TPs headed by a null infinitival T.

Our discussion here leads us to the wider conclusion that both to infinitive clauses and bare (to-less) infinitive clauses are TP constituents headed by an infinitive particle which has the overt spellout to in most types of infinitive clause, but has a null spellout in bare infinitive clauses. Given that we earlier argued that all finite clauses contain a TP projection (headed by a T which contains a Tense affix, and may or may not also contain an auxiliary), the overall conclusion which we reach is that all finite and infinitival clauses contain a TP, and that T is overt in clauses containing a finite auxiliary or infinitival to, but is null elsewhere (because to in bare infinitive clauses has a null spellout, and the tense affix in auxiliaryless finite clauses is lowered onto the main verb in the PF component). One advantage of this analysis is that it enables us to attain a uniform characterisation of the syntax of (finite and infinitival) clauses as TP structures headed by a T with a V or VP complement. (For alternative analyses of the types of structure discussed in this section, see Felser 1999a/b and Basilio 2003; and for arguments that verbless small clauses like that bracketed in I consider [Mary intelligent] also contain a null T, see Jiménez 2000a.)

3.6 Null C in finite clauses

The overall conclusion to be drawn from our discussion in §3.3-§3.5 is that all finite and infinitive clauses contain an overt or null T constituent which projects into TP (with the subject of the clause occupying the specifier position within TP). However, given that clauses can be introduced by complementisers such as if/that/for, a natural question to ask is whether apparently complementiserless clauses can likewise be argued to be CPs headed by a null complementiser. In this connection, consider the following:

(52)(a) We didn’t know [if he had resigned]
(b) We didn’t know [that he had resigned]
(c) We didn’t know [he had resigned]

The bracketed complement clause is interpreted as interrogative in force in (52a) and declarative in force in (52b), and it is plausible to suppose that the force of the clause is determined by a force feature carried
by the italicised complementiser introducing the clause: in other words, the bracketed clause is interrogative in force in (52a) because it is introduced by the interrogative complementiser if, and is declarative in force in (52b) because it is introduced by the declarative complementiser that.

But now consider the bare (i.e. seemingly complementiserless) clause in (52c): this can only be interpreted as declarative in force (not as interrogative), so that (52c) is synonymous with (52b) and not with (52a). Why should this be? One answer is to suppose that the bracketed bare clause in (52c) is a CP headed by a null variant of the declarative complementiser that (below symbolised as \(\text{that}\)), and that the bracketed complement clauses in (52a/b/c) have the structure (53) below:

\[
\begin{array}{c}
\text{CP} \\
\downarrow \\
\text{C} \\
\downarrow \\
\text{TP} \\
\downarrow \\
\text{PRN} \\
\text{he} \\
\downarrow \\
\text{T'} \\
\downarrow \\
\text{T} \\
\downarrow \\
\text{V} \\
\end{array}
\]

Given the analysis in (53), we could then say that the force of each of the bracketed complement clauses in (52) is determined by the force feature carried by the head C of the overall CP: in (52a) the clause is a CP headed by the interrogative complementiser if and so is interrogative in force; in (52b) it is a CP headed by the declarative complementiser that and so is declarative in force; and in (52c) it is a CP headed by a null variant of the declarative complementiser that and so is likewise declarative in force. More generally, the null complementiser analysis would enable us to arrive at a uniform characterisation of all finite clauses as CPs in which the force of a clause is indicated by the force feature carried by an (overt or null) complementiser introducing the clause.

Empirical evidence in support of the null complementiser analysis of bare complement clauses like that bracketed in (52c) comes from co-ordination facts in relation to sentences such as:

(54) We didn’t know [he had resigned] or [that he had been accused of corruption]

In (54), the italicised bare clause has been co-ordinated with a bold-printed clause which is clearly a CP since it is introduced by the overt complementiser that. If we make the traditional assumption that only constituents of the same type can be co-ordinated, it follows that the italicised clause he had resigned in (54) must be a CP headed by a null counterpart of that because it has been co-ordinated with a bold-printed clause headed by the overt complementiser that – as shown in simplified form in (55) below:

(55) We didn’t know [\(\text{that}\) he had resigned] or [\(\text{that}\) he had been accused of corruption]

What such an analysis implies is that the complementiser that can optionally be given a null phonetic spellout by having its phonetic features deleted in the PF component under certain circumstances: such an analysis dates back in spirit more than 4 decades (see e.g. Stockwell, Schachter and Partee 1973, p.599).

There are a number of conditions governing that-deletion. Lexical factors seem to play a part here, in that just as only some predicates which select an infinitival TP complement allow the infinitive particle to have a null spellout (as we saw in the previous section), so too only some predicatives which select a that-clause complement allow that to have a null spellout. Hornstein (2000) suggests that passive participles and adjectives resist that-deletion, but the real situation seems rather more complex. For example, the adjective clear readily allows that-deletion, but the adjective undeniable does not: cf.

(56)(a) It is clear [\(\text{that}\) he was framed] 
(b) It is clear [he was framed] 
(c) It is undeniable [\(\text{that}\) he was framed] 
(d) ?It is undeniable [he was framed]

(Irrelevantly, (57d) is grammatical if taken to be two separate sentences – e.g. \(\text{It is undeniable. He was framed.}\)) There are also structural constraints on that-deletion. As Hawkins (2001, p.13) notes, there is a strong adjacency effect insofar as that can generally only be deleted when it is asymmetrically c-commanded by and immediately adjacent to the relevant (bold-printed) predicate – as can be seen by comparing the examples in (56) above with those in (57) and (58) below:
(57)(a) It is clear to everyone [that he was framed] (b) ?It is clear to everyone [he was framed]

(58)(a) [That he was framed] is clear to everyone (b) *[He was framed] is clear to everyone

In (57), the adjectival predicate clear asymmetrically c-commands but is not immediately adjacent to that (the two being separated by the intervening prepositional phrase to everyone), and so that cannot be given a null spellout. In (58), that is neither c-commanded by nor immediately adjacent to clear, so that once again that cannot be given a null spellout. The adjacency requirement might suggest that complementiser deletion involves cliticisation of the null complementiser onto the head immediately above it – but precisely how, when and why complementisers receive a null spellout remains shrouded in mystery.

So far in this section, we have argued that seemingly complementiserless finite declarative complement clauses are introduced by a null C constituent (here analysed as a null counterpart of the complementiser that). However, the null C analysis can be extended from finite embedded clauses to main (= root = principal = independent) clauses like those produced by speakers A and B in (59) below:

(59) SPEAKER A: I am feeling thirsty
SPEAKER B: Do you feel like a Coke?

The sentence produced by speaker A is declarative in force (by virtue of being a statement). If force is marked by a force feature carried by the head C of CP, this suggests that such declarative main clauses are CPs headed by a null complementiser carrying a declarative force feature. And indeed, theoretical considerations require us to assume this, if we follow Rizzi (2000, p.288) in positing that the set of UG principles wired into the Language Faculty include a Categorial Uniformity Principle to the effect that all expressions of the same type belong to the same category (and, more specifically, all clauses with the same force belong to the same category): since declarative that-clauses like those bracketed in (55-58) are clearly CPs, it follows from the Categorial Uniformity Principle that all other declarative clauses (including declarative main clauses) must be CPs. This leads to the conclusion that a declarative main clause like that produced by speaker A in (59) is a CP headed by a null declarative complementiser. But what is the nature of the relevant null complementiser?

It seems unlikely that the null complementiser introducing declarative main clauses is a null counterpart of that, since that in English is only used to introduce embedded clauses, not main clauses. Let’s therefore suppose that declarative main clauses in English are introduced by an inherently null complementiser (below symbolised as ø), and hence that the sentence produced by speaker A in (59) has the structure shown in (60) below:

\[
\text{CP} \quad \text{C} \quad \phi \quad \text{TP} \quad \text{PRN} \quad \text{T} \quad \text{I} \quad \text{T} \quad \text{VP} \quad \text{am} \quad \text{V} \quad \text{A} \quad \text{feeling} \quad \text{thirsty}
\]

Under the CP analysis of main clauses in (60), the declarative force of the overall sentence is attributed to the fact that the sentence is a CP headed by a null complementiser ø which carries a declarative force feature which we can represent as [Dec-Force]. (The purists among you may object that it’s not appropriate to call a null declarative particle introducing a main clause a complementiser when it doesn’t introduce a complement clause: however, in keeping with work over the past 4 decades, we’ll use the term complementiser/C in a more general sense here, to designate a category of word which can introduce both complement clauses and other clauses, and which serves to mark properties such as force and finiteness.)

From a cross-linguistic perspective, an analysis such as (60) which posits that main clauses are CPs headed by a force-marking complementiser is by no means implausible in that we find languages like Arabic in which both declarative and interrogative main clauses can be introduced by an overt complementiser, as the examples below illustrate:
Moreover (as we will see in more detail in §4.2), there is some evidence from sentences like (62) below that inverted auxiliaries in main-clause yes-no questions occupy the head C position of CP in English:

(62)  

SPEAKER A: What were you going to ask me?  
SPEAKER B:  

(a) If you feel like a Coke  
(b) Do you feel like a Coke?  
(c) *If do you feel like a Coke?  

The fact that the inverted auxiliary do in (62b) occupies the same pre-subject position (in front of the bold-printed subject you) as the complementiser if in (62a), and the fact that if and do are mutually exclusive (as we see from the fact that structures like (62c) are ungrammatical) suggests that inverted auxiliaries (like complementisers) occupy the head C position of CP. This in turn means that main-clause questions are CPs headed by a C which is interrogative in force by virtue of containing an interrogative force feature which can be represented as [Int-Force].

Interestingly, an interrogative main clause can be co-ordinated with a declarative main clause, as we see from sentences like (63) below:

(63) [I am feeling thirsty], but [should I save my last Coke till later]?  

In (63) we have two (bracketed) main clauses joined together by the co-ordinating conjunction but. The second (italicised) conjunct should I save my last Coke till later? is an interrogative CP containing an inverted auxiliary in the head C position of CP. Given the traditional assumption that only constituents which belong to the same category can be co-ordinated, it follows that the first conjunct I am feeling thirsty must also be a CP; and since it contains no overt complementiser, it must be headed by a null complementiser – precisely as assumed in (60) above.

The more general conclusion which our discussion in this section leads us to is that all finite clauses have the status of CP constituents which are introduced by a complementiser. Finite complement clauses are CPs headed either by an overt complementiser like that or if or by a null complementiser (e.g. a null variant of that in the case of declarative complement clauses). Finite main clauses are likewise CPs headed by a C which contains an inverted auxiliary if the clause is interrogative, and an inherently null complementiser otherwise.

### 3.7 Null C in non-finite clauses

The overall conclusion to be drawn from our discussion in §3.6 is that all finite clauses (whether main clauses or complement clauses) are CPs headed by an (overt or null) complementiser which marks the force of the clause. But what about non-finite clauses? It seems clear that for-to infinitive clauses such as that bracketed in (64) below are CPs since they are introduced by the infinitival complementiser for:

(64) I will arrange [for them to see a specialist]  

But what about the type of (bracketed) infinitive complement clause found after verbs like want in sentences such as (65) below?

(65) She wanted [him to apologise]  

At first sight, it might seem as if the bracketed complement clause in sentences like (65) can’t be a CP, since it isn’t introduced by the infinitival complementiser for. However, it is interesting to note that the complement of want is indeed introduced by for when the infinitive complement is separated from the verb want in some way – e.g. when there is an intervening adverbial expression like more than anything as in (66a) below, or when the complement of want is in focus position in a pseudo-cleft sentence as in (66b): cf.
(66)(a) She wanted more than anything for him to apologise
(b) What she really wanted was for him to apologise

(Pseudo-cleft sentences are sentences such as ‘What John bought was a car’, where the italicised expression is said to be focused and to occupy focus position within the sentence.) This makes it plausible to suggest that the complement of want in structures like (65) is a CP headed by a null variant of for (below symbolised as for), so that (65) has the skeletal structure (67) below (simplified by showing only those parts of the structure immediately relevant to the discussion at hand):

(67) She wanted [CP [c for] [TP him [to] apologise]]

We can then say that the infinitive subject him is assigned accusative case by the complementiser for in structures like (67) in exactly the same way as the accusative subject them is assigned accusative case by the complementiser for in the bracketed complement clause in (64). (How case-marking works will be discussed in §3.9.) One way of accounting for why the complementiser isn’t overtly spelled out as for in structures like (67) is to suppose that it is given a null spellout (and thereby has its phonetic features deleted) when introducing the complement of a verb like want: we can accordingly refer to verbs like want as for-deletion verbs. For speakers of varieties of English such as mine, for-deletion is obligatory when the for-clause immediately follows a verb like want, but cannot apply when the for-clause is separated from want in some way – as the examples below illustrate:

(68)(a) *More than anything, she wanted for him to apologise
(b) More than anything, she wanted him to apologise
(c) She wanted more than anything for him to apologise
(d) *She wanted more than anything him to apologise

(69)(a) What she wanted was for him to apologise
(b) *What she wanted was him to apologise

It would seem, therefore, that for-deletion is subject to much the same strict adjacency requirement as that-deletion (discussed earlier in §3.6). Since have-cliticisation is subject to much the same conditions, it may be that for-deletion somehow involves the complementiser cliticising to the verb want and thereby being given a null spellout (in much the same way as in African American English/AAE sentences like (25) He gonna be there, I know he is, the form is has a null spellout only in contexts where in Standard English/SE it would cliticise to a host, so that AAE He gonna corresponds to SE He’s gonna).

Interestingly, not all for-deletion verbs behave exactly like want: for example, in my variety of English the verb prefer optionally (rather than obligatorily) allows deletion of for when it immediately follows prefer – cf.

(70)(a) We would very much prefer for you to be there
(b) We would very much prefer you to be there

The precise conditions governing when for can or cannot be deleted are unclear: there are complex lexical factors at work here (in that e.g. words like want and prefer may behave differently in a particular variety of English) and also complex sociolinguistic factors (in that there is considerable dialectal variation with respect to the use of for in infinitive complement clauses).

Having looked at for-deletion verbs which select an infinitival complement with an accusative subject, let’s now consider the syntax of control infinitive clauses with a null PRO subject like that bracketed in (71) below:

(71) I will arrange [PRO to see a specialist]

What we shall argue here is that control clauses which have a null PRO subject are introduced by a null infinitival complementiser. However, the null complementiser introducing control clauses differs from the null complementiser found in structures like want/prefer someone to do something in that it never surfaces as an overt form like for, and hence is inherently null. There is, however, parallelism between the structure of a for infinitive clause like that bracketed in (64) above, and that of a control infinitive clause like that bracketed in (71), in that they are both CPs and they have a parallel internal structure, as shown in (72a/b) below (simplified by not showing the internal structure of the verb phrase see a specialist):

(72a) I will arrange [PRO to see a specialist]
(72b) I will arrange [PRO to do something]

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The two types of clause thus have essentially the same CP+TP+VP structure, and differ only in that a for infinitive clause like (72a) has an overt for complementiser and an overt accusative subject like them, whereas a control infinitive clause like (72b) has a null ø complementiser and a null PRO subject.

Some evidence in support of claiming that a control clause with a null PRO subject is introduced by a null complementiser comes from co-ordination facts in relation to sentences such as the following:

(73)  I will arrange [to see a specialist] and [for my wife to see one at the same time]

The fact that the italicised control infinitive can be conjoined with the bold-printed CP headed by for suggests that control infinitives must be CPs (if only the same types of constituent can be conjoined).

Further evidence in support of the CP status of control infinitives comes from the fact that they can be focused in pseudo-cleft sentences. In this connection, consider the contrast below:

(74)(a)  What I’ll try and arrange is [for you to see a specialist]
(b)  *What I’ll try and arrange for is [you to see a specialist]
(c)  What I’ll try and arrange is [PRO to see a specialist]

The grammaticality of (74a) suggests that a CP like for you to see a specialist can occupy focus position in a pseudo-cleft sentence, whereas conversely the ungrammaticality of (74b) suggests that a TP like you to see a specialist cannot. If CP can be focused in pseudo-clefts but TP cannot, then the fact that a control infinitive like PRO to see a specialist can be focused in a pseudo-cleft like (74c) suggests that it must have the same CP status as (74a) – precisely as the analysis in (72b) above claims.

Overall, the conclusion which our analysis in this section leads us to is that infinitive complements containing the complementiser for (or its null counterpart for) are CPs, and so are control infinitives (which contain a null complementiser ø as well as a null PRO subject).

3.8 Defective Clauses

In §3.6, we argued that all finite clauses are CPs, and in §3.7 we went on to argue that for infinitives with accusative subjects and control infinitives with null PRO subjects are likewise CPs. These two assumptions lead us to the more general conclusion that:

(75)  All canonical (i.e. ‘normal’) clauses are CPs

And indeed this is an assumption made by Chomsky in recent work. However, there is one particular type of clause which is exceptional in that it lacks the CP layer found in canonical clauses – namely infinitival complement clauses like those bracketed in (76) below which have (italicised) accusative subjects:

(76)(a)  They believe [him to be innocent]       (b)  We didn’t intend [you to get hurt]

Complement clauses like those bracketed in (76) are exceptional in that their subjects are assigned accusative case by the transitive verb (believe/intend) immediately preceding them: what’s exceptional about this is that the verb is in a different clause from the subject which it assigns accusative case to. For this reason, such clauses are known as exceptional case-marking clauses (or ECM clauses); and verbs (like believe) when used with an ECM clause as their complement are known as ECM verbs.

ECM complement clauses seem to be TPs which lack the CP layer found in canonical clauses, and for this reason Chomsky (1999) terms them defective clauses. One reason for thinking that the bracketed ECM clauses in sentences like (76) are not full CPs is that they cannot readily be co-ordinated with for-infinitives, as we see from the ungrammaticality of (77) below:

(77)  *We didn’t intend [you to hurt him] or [for him to hurt you]
Although (for speakers like me) the verb *intend* can take either a bare ECM infinitive complement or a *for*-infinitive complement, the fact that the two cannot be conjoined suggests that the bare ECM infinitive clauses have the status of TPs while *for*-to infinitive clauses have the status of CPs. By contrast, co-ordination is indeed possible in sentences like:

(78) We didn’t intend [you to hurt him] or [him to hurt you]

and this is because both bracketed clauses in (78) are infinitival TPs.

Further evidence that ECM infinitive clauses like those bracketed in (76) are TPs rather than CPs comes from the fact that they cannot occur in focus position in pseudo-clefts, as we see from the ungrammaticality of the sentences below:

(79)(a) *What they believe is [him to be innocent]
(b) *What we hadn’t intended was [you to get hurt]

If ECM clauses are TPs, this follows from the restriction noted in (74) that only CP (not TPs) can occur in focus position in a pseudo-cleft sentence. Moreover, a further property of sentences like (76) which would be difficult to account for if the bracketed complement clause were a CP is the fact that its (italicised) subject can be passivised and thereby made into the subject of the main clause, as in (80) below:

(80)(a) He is believed to be innocent
       (b) You weren’t intended to get hurt

This is because it is a property of the subject of an infinitival CP complement clause like that bracketed in (81a) below that its subject cannot be passivised – as we see from the ungrammaticality of (81b):

(81)(a) We didn’t intend [for you to get hurt]
       (b) *You weren’t intended [for to get hurt]

Likewise, the subject of the infinitival CP complement of a *for*-deletion verb like *want* cannot be passivised either: cf.

(82)(a) She wanted [John to apologise]
       (b) *John was wanted [to apologise]

– and indeed this is precisely what we expect if the subjects of CPs cannot passivise, and if the bracketed complement clauses in (82) are CPs headed by a null counterpart of *for*, as claimed in §3.7. However, the fact that the passive sentences in (80) are grammatical suggests that the bracketed complement clauses in (76) are TPs rather than CPs (since the subject of an infinitival TP can be passivised, but not the subject of an infinitival CP). Hence, complement clauses like those bracketed in (76) above are defective clauses which have no CP layer, and (77a) *They believe him to be innocent* accordingly has the structure (83) below (with *Af* representing a present-tense affix):

(83)

```
CP
  C
    ø
  TP
    PRN
      they
    T
      T'
        VP
          Af
            believe
          TP
            PRN
              him
            T'
              to
                VP
          A
            be
              innocent
```

The particular aspect of the analysis in (83) most relevant to our discussion in this section is the claim that the complement clause *him to be innocent* is an infinitival TP headed by *to*, and its subject *him* is assigned accusative case by the transitive verb *believe*: how this happens, we shall look at in the next section.

We can extend the analysis of ECM predicates like *believe* proposed in this section to verbs like those
discussed in §3.5 which select a bare infinitive complement. On this view, a sentence like \textit{I have never known him be rude to anyone} (found in varieties of English like my own British variety) would be analysed as containing a transitive perfect participle \textit{known} which selects a TP complement headed by a null counterpart of infinitival \textit{to} – as shown in skeletal form below:

\begin{equation}
\text{(84)} \quad \text{I have never known \text{[TP} him \text{[T to be rude to anyone\text{]}}}
\end{equation}

Since the subject of a TP complement can passivise, the analysis in (84) predicts that the subject of the bracketed infinitive complement in (84) can passivise, and this is indeed the case as we see from examples like (85) below:

\begin{equation}
\text{(85)} \quad \text{He has never been known to be rude to anyone}
\end{equation}

Because (in the relevant variety) infinitival \textit{to} can only have a null spellout when the TP complement it heads is the complement of an active transitive verb-form like the perfect participle \textit{known} in (84) and not when the relevant TP is the complement of a passive participle like \textit{known} in (85), it follows that infinitival \textit{to} must be given an overt spellout in passive structures like (85).

Under the analysis proposed here, verbs which take a bare infinitive complement with an accusative subject are analysed as ECM predicates which select a TP complement headed by an infinitival T which has an overt spellout as \textit{to} in passive structures like (85) and a null spellout in active structures such as (84). However, one predicate which is problematic to classify in such terms is \textit{let}, since it allows a bare infinitive complement in active structures like (86a) below but doesn’t normally allow the subject of the infinitive to passivise, as we see from the ungrammaticality of sentences like (86b):

\begin{equation}
\text{(86)(a)} \quad \text{You shouldn’t let [him upset you]} \quad \text{(b) *He shouldn’t be let [(to) upset you]}
\end{equation}

We can’t describe the relevant facts by saying that \textit{let} is a defective verb which has no passive participle form, since \textit{let} is used as a passive participle in sentences like \textit{The prisoners were let out of jail}. An alternative analysis is to suppose that whereas typical ECM predicates select an infinitival TP complement in both active and passive uses, \textit{let} is irregular in that it only selects an infinitival TP complement in active uses, not when used as a passive participle (though I heard one TV soccer commentator say ‘Several bad tackles have been let go in this game’, and likewise heard a Chelsea footballer interviewed about life under the new English manager saying ‘You are let know that you have to perform at the top level’).

Similar lexical idiosyncrasies are found with a number of other verbs: for example, \textit{know} (in my variety of English) only allows a bare infinitival complement with an accusative subject when used as a perfect participle in structures like (84) above. (An alternative way of accounting for the impossibility of passivisation in sentences like (86b) which we won’t adopt here is to take \textit{let} to be a verb selecting a CP complement headed by an inherently null complementiser which in turn selects an infinitival TP complement headed by a null counterpart of infinitival \textit{to}; the ungrammaticality of (86b) then follows from the impossibility of passivising the subject of a CP complement.)

\section*{3.9 Case properties of subjects}

A question which we haven’t addressed so far is how subjects are case-marked. In this connection, consider how the italicised subject of the bracketed infinitive complement clause in (87) below is assigned accusative case:

\begin{equation}
\text{(87)} \quad \text{She must be keen \text{[for him to meet them]}}
\end{equation}

Since \textit{for} is a prepositional complementiser (and the preposition \textit{for} assigns accusative case to its complement – e.g. to its complement \textit{me} in a sentence like \textit{Do it for me!}), it seems plausible to suppose that the infinitive subject \textit{him} is assigned accusative case by the prepositional complementiser \textit{for}. Items which assign accusative case are traditionally said to be \textbf{transitive}. Accordingly, let us suppose that the infinitive subject \textit{him} is assigned accusative case by the transitive complementiser \textit{for} in (87). But how? We’ve already seen that the relation \textbf{c-command} plays a central role in the syntax of a wide range of phenomena, including the binding of anaphors, morphological operations like Affix Hopping, phonological operations like \textit{have}-cliticisation, and so on. It therefore seems plausible to hypothesise that c-command is also central to case assignment. More particularly, let’s suppose that:

\begin{equation}
\text{(88)} \quad \text{A transitive head assigns accusative case to a noun or pronoun expression which it c-commands}
\end{equation}
In addition, let’s follow Pesetsky (1995) in positing the following UG principle governing the application of grammatical (and other kinds of linguistic) operations:

(89) **Earliness Principle**
Operations apply as early in a derivation as possible

In the light of (88) and (89), let’s look at the derivation of the bracketed complement clause in (87). The first step is for the verb *meet* to be merged with its pronoun complement *them* to form the VP shown in (90) below:

\[(90)\]
\[
\begin{array}{c}
V \\
meet \\
\end{array}
\begin{array}{c}
PRN \\
them \\
\end{array}
\]

*Meet* is a transitive verb which c-commands the pronoun *them*. Since (88) specifies that a transitive head assigns accusative case to a pronoun which it c-commands, and since the Earliness Principle specifies that operations like case assignment must apply as early as possible in a derivation, it follows that the pronoun *them* will be assigned accusative case by the transitive verb *meet* at the stage of derivation shown in (90).

The derivation then continues by merging the infinitive particle *to* with the VP in (90), so forming the T-bar *to meet them*. The resulting T-bar is merged with its subject *him* to form the TP *him to meet them*. This TP in turn is merged with the complementiser *for* to form the CP shown in (91) below:

\[(91)\]
\[
\begin{array}{c}
C \\
for \\
\end{array}
\begin{array}{c}
TP \\
\begin{array}{c}
PRN \\
him \\
\end{array}
\end{array}
\begin{array}{c}
T' \\
to \\
\end{array}
\begin{array}{c}
V \\
meet \\
\end{array}
\begin{array}{c}
PRN \\
them \\
\end{array}
\]

*For* is a transitive (prepositional) complementiser and c-commands the infinitive subject *him*. Since (88) specifies that a transitive head assigns accusative case to a pronoun which it c-commands, and since the Earliness Principle specifies that operations like case assignment must apply as early as possible in a derivation, it follows that the pronoun *him* will be assigned accusative case by the transitive complementiser *for* at the stage of derivation shown in (91). This account of the case-marking of infinitive subjects can be extended from accusative subjects of *for* infinitives in structures like (91) to accusative subjects of ECM infinitives in structures like (83) *They believe [him to be innocent]*, since the transitive verb *believe* c-commands the infinitive subject *him* in (83). (As we shall see in chapter 8, a tacit assumption underlying the case assignment analysis is that noun and pronoun expressions enter the syntax carrying a case feature which is initially unvalued, and which is then valued as nominative, accusative or genitive by a c-commanding head of an appropriate kind.)

Having looked at how accusative subjects are case-marked, let’s now turn to look at the case-marking of nominative subjects. In this connection, consider the case-marking of the italicised subjects in (92) below:

(92) *He may suspect [that she is lying]*

Consider first how the complement clause subject *she* is assigned case. The bracketed complement clause in (92) has the structure (93) below:

\[(93)\]
If we are to develop a unitary theory of case-marking, it seems plausible to suppose that nominative subjects (just like accusative subjects) are assigned case under c-command by an appropriate kind of head. Since the finite complementiser *that* in (93) c-commands the subject *she*, let’s suppose that *she* is assigned nominative case by the complementiser *that* (in much the same way as the infinitive subject *him* in (91) is assigned accusative case by the transitive complementiser *for*). More specifically, let’s assume that

\[
\text{(94) A finite complementiser assigns nominative case to a noun or pronoun expression which it c-commands}
\]

In (94), the only noun or pronoun expression c-commanded by the finite complementiser *that* is the clause subject *she*, which is therefore assigned nominative case in accordance with (94).

But how can we account for the fact that the main clause subject *he* in (92) is also assigned nominative case? The answer is that (as we argued in §3.6) all canonical clauses – including all main clauses – are CPs introduced by a complementiser, and that if the clause contains no overt complementiser, it is headed by a null complementiser. This being so, the main clause in (92) will have the structure (95) below:

\[
\text{(95) An intransitive finite complementiser assigns nominative case to a noun or pronoun expression which it c-commands}
\]

Thus, the overall clause is headed by a null finite declarative complementiser \(C \phi\) in much the same way as the Arabic main clauses in (61) are headed by an overt complementiser, and it is this null finite complementiser which assigns nominative case to the subject *he* in (95) accordance with (94) above, since the complementiser \(\phi\) c-commands the pronoun *he*. (On the possibility of a finite C being a nominative case assigner, see Chomsky 1999, p.35, fn.17.)

However, an interesting complication arises in relation to the Arabic data in (61) above. Sentence (61a) is introduced by the transitive finite complementiser "inna ‘that’ and the subject *lwalada ‘the boy’ is assigned accusative case in accordance with (88). By contrast, sentence (61b) is introduced by the finite complementiser *hal ‘if’; this is not transitive and assigns nominative case to the subject *lwaladu* (which therefore carries the nominative ending -*u* rather than the accusative ending -*a*). Such considerations suggest that we need to revise (94) by adding the italicised condition shown in (96) below:

\[
\text{(96) An intransitive finite complementiser assigns nominative case to a noun or pronoun expression which it c-commands}
\]

Since none of the English finite complementisers (e.g. *if, that, that* and the null finite complementiser found in main clauses) are transitive, all finite clauses in English will have nominative subjects.

Having looked at accusative and nominative subjects, let’s now turn to consider the null PRO subjects found in control clauses. If we suppose that it is a defining characteristic of all pronouns that they carry case, then PRO too must carry case – and indeed there is some evidence that this is so. Part of the relevant evidence comes from structures like (97) below which contain a bold-printed floating quantifier which modifies the italicised subject of its clause, but is separated from (and positioned lower than) the subject:
They have all gone home

In a language like Icelandic which has a richer morphology than English, floating quantifiers agree in case with their antecedent (i.e. with the expression which they quantify). In a structure like (98) below (from Sigurðsson 1991, p.331) the verb leiðist ‘got bored’ requires a subject with dative (= DAT) case, and hence a floating quantifier modifying the subject also has dative case:

(98)  Strákarnir leiðist óllum í skóla
the.boys.DAT bored all.DAT in school
‘The boys all got bored in school’

Interestingly, when the relevant verb is used in a control clause, a floating quantifier modifying the subject of the control clause has dative case, as the following example (from Sigurðsson ibid) shows:

(99)  Strákarnir vonast til [að PRO leiðast ekki óllum í skóla]
The.boys.NOM hoped for [to PRO bore not all.DAT at school]
The boys hoped to not all get bored at school

Why should the floating quantifier in (99) be dative? It doesn’t carry the same case as the main clause subject strákarnir ‘the boys’, since the latter has nominative (= NOM) case. On the contrary, the floating quantifier carries the same case as (and is construed as quantifying) the null PRO subject of its clause, and PRO has dative case because it is an idiosyncratic property of the relevant verb in Icelandic that it requires a dative subject. (Icelandic is said to be a language with quirky-case subjects in that some verbs require dative subjects, others require accusative subjects and so on. On dative and quirky subjects, see Moore and Perlmutter 2000, and Sigurðsson 2002.)

In short, the syntax of floating quantifiers in Icelandic makes it clear that PRO has case properties of its own. But what case does PRO carry in a morphologically impoverished language like English? Chomsky and Lasnik (1993) and Martin (2001) suggest that the subject of a control clause carries what they call null case. The morphological effect of null case is to ensure that a pronoun is unpronounced – just as the morphological effect of nominative case is to ensure that (e.g.) a third person masculine singular pronoun is pronounced as he. But how is PRO assigned null case? If we are to attain a unitary account of case-marking under which a noun or pronoun expression is case-marked by a head which c-commands it, a plausible answer is the following:

(100)  A null intransitive non-finite complementiser assigns null case to a noun or pronoun expression which it c-commands

It follows from (100) that PRO in a structure like (72b) above will be assigned null case by the null (non-finite, intransitive) complementiser which c-commands PRO. (For an alternative analysis of PRO as a silent pronoun with ‘real’ – e.g. nominative/accusative – morphological case, see Landau 2004, 2006.)

We can conflate the various claims made about case-marking above into (101) below:

(101)  Case Assignment Conditions

A noun or pronoun expression is assigned case by the closest case-assigner which c-commands it (in consequence of the Earliness Principle) and is assigned

(i)  accusative case if c-commanded by a transitive head (e.g. a transitive verb like meet, or a transitive preposition like with or a transitive complementiser like for or for)

(ii)  nominative case if c-commanded by an intransitive finite complementiser (like that, that, if or the null declarative main-clause complementiser φ)

(iii)  null case if c-commanded by a null intransitive non-finite complementiser φ

If we assume that PRO is the only exponent of null case in English, it follows from (101iii) that control infinitive clauses (which are headed by a null-case-assigning complementiser under the analysis in §3.7) will always require a PRO subject.

What is particularly interesting about our discussion of case-marking here from a theoretical point of view is that it provides yet more evidence for the centrality of the relation c-command in syntax. (See Frank and Vijay-Shanker 2001 for a technical defense of the primitive nature of c-command.) An important theoretical question to ask at this juncture is why c-command should be such a fundamental relation in syntax. From a minimalist perspective (since the goal of Minimalism is to utilise only theoretical apparatus which is conceptually necessary), the most principled answer would be one along the
following lines. It is clear that the operation **Merge** (which builds phrases out of words, and sentences out of phrases) is conceptually necessary, in that (e.g.) to form a prepositional phrase like *to Paris* out of the preposition *to* and the noun *Paris*, we need some operation like Merge which combines the two together. In order to achieve the Minimalist goal of developing a constrained theory of Universal Grammar/UG which makes use only of constructs which are **conceptually necessary**, we can suppose that the only kind of syntactic relations which UG permits us to make use of are those created by the operation Merge. Now, two structural relations created by the operation Merge are **containment** and **c-command** in that if we merge a head X with a complement YP to form an XP projection, XP contains X, YP and all the constituents of YP, and X c-commands YP and all the constituents of YP. Minimalist considerations therefore leads us to hypothesise that the containment and c-command relations created by merger are the only primitive relations in syntax. (Indeed, a more constrained possibility envisaged in Chomsky 2006 is that Merge may be the only primitive relation in syntax: e.g. that a probe can only search for a goal within a constituent which it is (first-) merged, a possibility which Chomsky refers to as **minimal search**).

Our discussion in this section shows that case-marking phenomena can be accounted for in a principled fashion within a highly constrained Minimalist framework which makes use of the c-command relation which is created by the operation Merge. Note that a number of other grammatical relations which traditional grammars make use of (e.g. relations like **subjecthood** and **objecthood**) are not relations which can be used within the Minimalist framework. For example, a typical characterisation of accusative case assignment in traditional grammar is that a transitive verb or preposition assigns accusative case to its object. There are two problems with carrying over such a generalisation into the framework we are using here. The first is that Minimalism is a constrained theory which does not allow us to appeal to the relation objecthood, only to the relations containment and c-command; the second is that the traditional objecthood account of accusative case assignment is empirically inadequate, in that it fails to account for the accusative case-marking of an infinitive subject by a transitive complementiser in structures like (91), because *him* is not the object of the complementiser *for* but rather the subject of *to meet them* (and the same holds for accusative subjects of ECM infinitive structures like (83) above). As our discussion in later chapter unfolds, it will become clear that there are a number of other syntactic phenomena which can be given a principled description in terms of the relations containment and c-command.

### 3.10 Null determiners and quantifiers

Thus far, we have argued that empty categories play an important role in the syntax of clauses in that clauses may contain a null subject, a null T constituent and a null C constituent. We now turn to argue that the same is true of the syntax of **nominals** (i.e. noun expressions), and that **bare nominals** (i.e. noun expressions which contain no overt determiner or quantifier) are generally headed by a null deteriner or null quantifier. The assumption that bare nominals contain a null determiner/quantifier has a long history, dating back to a suggestion made by Chomsky (1965, p. 108). Chomsky’s idea was taken up and extended in later work by Abney (1987), Longobardi (1994, 1996, 2001) and Bernstein (2001).

In this connection, consider the syntax of the italicised bare nominals in (102) below:

(102)  

*John* admires *Mary*  

As we see from (103a) below, the Greek counterparts of the bare nouns in (102) are DPs headed by a definite determiner:

(103)  

O Gianis thavmazi tin Maria  

The John admires the Mary (= ‘John admires Mary’)

This raises the possibility that bare nouns like those italicised in (102) above are DPs headed by a null definite determiner, so that the overall sentence in (102) has the structure (104) below:
The assumption that bare definite noun expressions are DPs is known as the **DP hypothesis**. Such a DP analysis is plausible from a semantic perspective in that a name like *John* is a referring expression which denotes a specific/definite individual in precisely the same way as a DP such as *this/that/the boy* does.

One piece of empirical evidence in support of analysing bare nouns as DPs comes from sentences like:

(105) *John* and [the chairman] are attending a meeting

The fact that a bare noun like *John* can be co-ordinated with a determiner phrase/DP like *the chairman* provides us with empirical evidence that bare nouns must be DPs, given the assumption that only similar kinds of categories can be co-ordinated.

If (as we are suggesting here) English has a null D constituent, we should expect this not only to have identifiable semantic properties (viz. in marking definiteness/specificity) but also to have identifiable grammatical properties. And indeed there is evidence that (like definite determiners such as *this/these*), the null D constituent carries person properties. In this respect, consider sentences such as:

(106)(a) We linguists take *ourselves/*yourselves/*themselves* too seriously, don’t *we/*you/*they*?
(b) You linguists take *yourselves/*ourselves/*themselves* too seriously, don’t *you/*we/*they*?
(c) John takes *himself/*ourselves/*yourselves* too seriously, doesn’t *he/*don’t *we/*don’t *you*?

(106a) shows that a first person expression such as *we linguists* can only bind (i.e. serve as the antecedent of) a first person reflexive like *ourselves*, and can only be tagged by a first person pronoun like *we*. (106b) shows that a second person expression like *you linguists* can only bind a second person reflexive like *yourselves*, and can only be tagged by a second person pronoun like *you*. (106c) shows that a bare noun like *John* can only bind a third person reflexive like *himself* and can only be tagged by a third person pronoun like *he*. One way to account for the relevant facts is to suppose that the nominals *we linguists/*you linguists/*John* in (106a/b/c) are DPs with the respective structures shown in (107a/b/c) below:

(107)(a)  
\[
\begin{array}{c}
\text{DP} \\
\text{D} & \text{N} \\
\text{we} & \text{linguists}
\end{array}
\]

(b)  
\[
\begin{array}{c}
\text{DP} \\
\text{D} & \text{N} \\
\text{you} & \text{linguists}
\end{array}
\]

(c)  
\[
\begin{array}{c}
\text{DP} \\
\text{D} & \text{N} \\
\text{\textdollar} & \text{John}
\end{array}
\]

and that the person properties of a DP are determined by the person features carried by its head determiner. If *we* is a first person determiner, *you* is a second person determiner and \(\text{\textdollar}\) is a third person determiner, the grammaticality judgments in (106a/b/c) above are precisely as the analysis in (107a/b/c) would lead us to expect. More generally, we can conclude that all definite referring expressions are D-expressions: thus, an expression such as *the chairman* is a DP headed by the overt determiner *the*; a name/proper noun such as *John* is a DP headed by a null determiner; and a definite pronoun such as *he* is a pronominal D-constituent (or a D-pronoun).

In addition to having a null definite determiner, English can also be argued to have a null (indefinite) quantifier. In this connection, consider the following sentences:

(108)(a) *Eggs* and *many dairy products* cause cholesterol
(b) I’d like *toast* and *some coffee* please

The fact that the bare plural noun *eggs* is co-ordinated with the QP/quantifier phrase *many dairy products* in (108a) suggests that *eggs* is a QP headed by a null quantifier. Likewise, the fact that the bare singular
noun *toast* is co-ordinated with the QP *some coffee* in (108b) suggests that *toast* is also a QP headed by a null quantifier, so that the italicised nouns in (108) have the structure shown below:

(109)

```
       QP
       \_\_\_
       Q     N
       ø     eggs/toast
```

The null quantifier has the semantic property of being generic or partitive in interpretation: thus, *eggs* in (108a) has a generic interpretation which can be paraphrased as ‘eggs in general’, while *toast* in (108b) has a partitive interpretation paraphrasable as ‘some toast’.

In addition to having its own semantic properties, the null quantifier found in ‘bare’ indefinite noun expressions in English has its own *selectional* properties – as illustrated by the following examples:

(110)

(a) I wrote *poems*  
(b) I wrote *poetry*  
(c) *I wrote poem*

If each of the italicised bare nouns in (110) is the complement of a null quantifier ø, the relevant examples show that ø can select as its complement an expression headed by a plural count noun like *poems*, or by a singular mass noun like *poetry* – but not by a singular count noun like *poem*. The complement-selection properties of the null quantifier ø mirror those of the overt quantifier *enough*: cf.

(111)

(a) I’ve read *enough poetry*  
(b) I’ve read *enough poems*  
(c) *I’ve read enough poem*

The fact that ø has much the same selectional properties as a typical overt quantifier such as *enough* strengthens the case for positing the existence of a null quantifier ø, and for analysing bare indefinite noun expressions as QPs headed by a null quantifier.

We have argued that bare definite noun expressions (like *John*) are DPs headed by a null determiner which is definite in interpretation, and that bare indefinite noun expressions (like *toast* or *eggs*) are QPs headed by a null quantifier which is generic or partitive in interpretation. The claim that null determiners and quantifiers have specific semantic properties is an important one from a theoretical perspective in the light of the principle suggested by Chomsky (1995) that all heads must be *interpretable* at the *semantics interface* (i.e. must be able to be assigned a semantic interpretation by the semantic component of the grammar, and hence must contribute something to the meaning of the sentence containing them). This principle holds of null constituents as well as overt constituents, so that a seemingly null T constituent contains an abstract affix carrying an interpretable tense feature, and a null C constituent contains an abstract morpheme carrying an interpretable force feature. If the null D constituent found in a structure like (107c) is definite in interpretation and the null Q found in a structure like (109) is generic or partitive in interpretation, the requirement for heads to have identifiable semantic properties will be met.

We have argued in this section that definite/indefinite noun expressions are DPs/QPs with an overt or null head. However, there is evidence that this is true only of nominal expressions used as *arguments* (i.e. nominals used as the subject or complement of a predicate), not of non-argument nominals (e.g. nominals which have a vocative, predicative or exclamative use). More specifically (as Longobardi 1994 argues), nonargument nominals such as those italicised in (112) below can be simple N-projections lacking a determiner or quantifier:

(112)

(a) Do all syntacticians suffer from asteriskitis, *doctor*?  
(b) Dr Dolittle is *head of department*  
(c) *Poor fool! He thought he’d passed the syntax exam*

The italicised nominal expression serves a vocative function (i.e. is used to address someone) in (112a), a predicative function in (112b) (in that the property of being head of department is predicated of the unfortunate Dr Dolittle), and an exclamative function in (112c). Each of the italicised nominals in (112) is headed by a singular count noun (*doctor/head/fool*): in spite of the fact that such nouns require an overt quantifier or determiner when used as arguments, here they function as non-arguments and are used without any determiner. This suggests that nonargument nominals can be simple N-expressions, whereas argument nominals are always D-expressions (if definite referring expressions) or Q-expressions (if indefinite or quantified expressions): see Chomsky (1999, fn. 10). This assumption has interesting implications for the analysis of sentences such as
The chairman wanted a biscuit with his coffee.

It suggests that the definite expression the chairman is a DP headed by the definite determiner the, where the indefinite expression a biscuit is a QP headed by the indefinite quantifier a. Some evidence in support of this assumption comes from contrasts such as the following:

(a) Who didn’t he want [a/any picture of]?
(b) *Who didn’t he want [the/this picture of]?

In each of these sentences, the wh-pronoun originates as the complement of the preposition of (as we can see from echo questions like He didn’t want a/any/the/this picture of who?), and is then extracted out of the bracketed noun expression and moved to the front of the overall sentence. Why should extraction of who be possible out of the bracketed noun expression in (114a), but not out of that in (114b)? One answer is to suppose that a/any picture of who is a QP but the/this picture of who is a DP, and that QPs allow constituents to be extracted out of them, but DPs do not. If so, the fact that extraction is also possible out of a bare noun expression like that bracketed below would be consistent with the assumption that the bracketed nominal in (115) is a QP headed by a null quantifier.

3.11 Summary

In this chapter, we have seen that null constituents (i.e. constituents which have no overt phonetic form but have specific grammatical and semantic properties) play a central role in syntax. We began by looking at null (finite, imperative, truncated and nonfinite) subjects in §3.2, arguing in particular that control infinitive clauses have a null PRO subject which can refer to some expression within a higher clause, or refer to some entity in the domain of discourse, or have arbitrary reference. In §3.3 we showed that elliptical clauses like that bracketed in He could have helped her or [she have helped him] are TPs headed by a null (ellipsed) tense auxiliary. In §3.4 we extended this null T analysis to auxiliariless finite clauses like He enjoys syntax, arguing that they contain a TP headed by an abstract Tense affix which is lowered onto the main verb by the morphological operation of Affix Hopping in the PF component. In §3.5 we argued that bare (to-less) infinitive clauses like that bracketed in I can’t let [you have my password] are TPs headed by a null variant of infinitival to. We concluded that all finite and infinitive clauses contain a TP headed by an overt or null T constituent carrying finite or nonfinite tense. In §3.6, we argued that all finite clauses are CPs, and that those which are not introduced by an overt complementiser are CPs headed by a null complementiser which encodes the force of the clause (so that a sentence like He enjoys syntax is declarative in force by virtue of being a CP headed by a null declarative C). In §3.7 we saw that for infinitives, the infinitive complements of want-class verbs, and control infinitives are also CPs, and went on to posit that all canonical clauses are CPs. However, in §3.8 we argued that ECM (Exceptional Case Marking) clauses with accusative subjects like that bracketed in I believe [him to be innocent] are defective clauses which have the status of TPs rather than CPs. In §3.9 we examined case-marking, arguing that a transitive head assigns accusative case to a noun or pronoun expression which it c-commands, an intransitive finite complementiser assigns nominative case to a noun or pronoun expression which it c-commands, and a null intransitive non-finite complementiser assigns null case to a pronoun which it c-commands. We also noted that in consequence of Pesetsky’s Earliness Principle, noun and pronoun expressions are case-marked as early as possible in the derivation. In §3.10, we looked briefly at the syntax of nominals, maintaining that bare definite nominal arguments are DPs headed by a null determiner, and bare indefinite or quantified nominal arguments are QPs headed by a null quantifier; consequently, in a sentence such as John wanted eggs for breakfast, the bare noun John is a DP headed by a null definite determiner, whereas the bare noun eggs is a QP headed by a null indefinite quantifier. However, we noted that there are a class of defective (vocative, exclamative and predicate) nominals which can have the status of simple N-expressions (lacking a D or Q constituent).
WORKBOOK SECTION

Exercise 3.1

Draw tree diagrams to represent the structure of the following sentences, presenting arguments in support of your analysis and commenting on any null constituents they contain and the reasons for positing them. In addition, say how each of the noun or pronoun expressions is case-marked.

1. Students enjoy the classes
2. We have fun
3. Voters know politicians lie
4. John promised to behave himself
5. She sees no need for him to apologise
6. They would prefer students to do exams
7. Economists expect salaries to rise
8. He might like you to talk to her
9. %I have known you have a tantrum
10. John wanted to help him

(The % sign in 9 indicates that this kind of to-less infinitive structure is only found after known in some varieties of English, including my own British variety.). In addition, say why have-cliticisation is or is not permitted in 11b/12b/13b/14 below:

11a. They have suffered hardship
11b. They’ve suffered hardship
12a. The Sioux have suffered hardship
12b. *The Sioux’ve suffered hardship
13a. Sioux have suffered hardship
13b. *Sioux’ve suffered hardship
14. SPEAKER A: How are students coping with your Fantasy Syntax course?
   SPEAKER B: *Two’ve given up

Helpful hints

Bear in mind that in the main text we argued that all clauses other than nonfinite clauses used as the complement of an ECM verb are CPs, and that bare definite nominal arguments are DP headed by a null definite D, and bare indefinite nominal arguments are QP constituents headed by a null indefinite Q. For the purposes of this exercise, assume the following condition on have-cliticisation:

(i) Have can cliticise onto a word W provided that
   (a) W ends in a vowel or diphthong
   (b) W asymmetrically c-commands have
   (c) There is no intervening constituent c-commanded by W and c-commanding have

In relation to 3, consider what case politicians has, and how you can use this to determine whether the complement of know is a TP or a CP. In 4, use Binding Principle A from Exercise 2.2 to help you account for why himself is coreferential to John. In 5, assume that no is a negative quantifier which has a noun phrase complement. In 9, assume that won’t is a negative auxiliary which occupies the head T position of TP. In 10, use Binding Principle B from Exercise 2.2 to help you account for why him cannot be coreferential to John. In relation to the (b, B) examples in 11-15, draw trees to represent the structure of the sentences immediately prior to cliticisation, and then show whether or not the analysis of have-cliticisation given here predicts that cliticisation is possible; note that the noun Sioux is pronounced [su:]. Show how the ungrammatical of 13b can be used to evaluate the hypothesis that a bare noun like Sioux in 13 is a DP headed by a null determiner. In addition, say how sentences like 11b can be used to evaluate the plausibility of analyses (such as that proposed by Freidin and Vergnaud 2001) which take pronouns like they to be determiners which have a nominal complement whose phonetic features are given a null spellout in the PF component, so that e.g. if they refers to Sioux, the pronoun they would be a DP with the structure shown below:

(ii) DP
   D  N
   they  Sioux

Would it be any more or less plausible to suppose that the (numeral) quantifier two in sentences like that produced by speaker B in 14 has an null N complement (interpreted as referring to the noun students)? In relation to 15, assume that have left is an AUXP comprising the AUX have and the V left.
Model answer for 1

Given the arguments in the main text that all finite clauses contain a TP headed by a T constituent containing an Affix which encodes Tense and (Person and Number) agreement features, the sentence *Students enjoy the classes* will contain a TP headed by a Tense affix which carries the features [third-person, plural-number, present-tense], which we can abbreviate to \(AF_{3P,PL} \). Likewise, given the arguments in the main text that ordinary finite clauses are CPs headed by an (overt or null) complementiser which marks the force of the clause, the overall sentence will be a CP headed by a null finite declarative complementiser \(\emptyset\). In addition, the indefinite bare noun *students* will be a QP headed by a null quantifier which is generic in interpretation (and so is paraphrasable as ‘students in general’). Given these assumptions, sentence 1 will have the structure shown below:

(i) CP
   ┌────────────────────────┐
   │                      │
   │ C                    │
   │                      │
   └──────────────────────┘
      TP
         ┌──┬──┐
         │ T │ VP│
         └──┴──┘
            ┌───┬───┐
            │ Q │ N │
            └───┴───┘
                ┌───┬───┐
                │ D │ N │
                └───┴───┘
                   │
                   └──────┘
                     V
equjoy

Because there is no auxiliary in T for it to attach to, the tense affix in T is lowered onto the verb *enjoy* by the morphological operation of **Affix Hopping** in the PF component, forming *enjoy+AF_{3P,PL}* (which is ultimately spelled out as the third person plural present tense form *enjoy*).

Evidence that the overall clause *Students enjoy the classes* is a CP headed by a null complementiser comes from co-ordination facts in relation to sentences such as:

(ii) [Students enjoy the classes] but [do they like the lectures]?

In (ii) the declarative clause *Students enjoy the classes* has been co-ordinated with the interrogative clause *do they like the lectures?* which contains the inverted auxiliary *do*. If (as claimed in the main text) inverted auxiliaries occupy the head C position of CP, it follows that the second of the two co-ordinate clauses in (ii) must be a CP; and if only constituents of the same type can be co-ordinated, it follows that the first clause must also be a CP – as in (i) above. Evidence in support of positing a null present-tense T constituent in (i) comes from the fact that the T-bar \(\emptyset\) *enjoy the classes* can be co-ordinated with another T-bar like *don’t like the lectures*, as we see from (iii) below:

(iii) Students *enjoy the classes*, but *don’t like the lectures*

Evidence that the bare nominal *students* is a QP headed by a null quantifier comes from the fact that it can be co-ordinated with a QP such as *many teachers*, as in:

(iv) *Students* and *many teachers* *enjoy the classes*

The DP *the classes* in (i) is assigned accusative case by virtue of being c-commanded by the transitive verb *enjoy*. Accordingly, the DP *the classes* can be substituted by an accusative pronoun, as in:

(v) *Students* enjoy *them*

By contrast, the QP \(\emptyset\) *students* is assigned nominative case by virtue of being c-commanded by the intransitive finite complementiser \(\emptyset\). We therefore correctly predict that this DP can be substituted by a nominative pronoun, as in:

(vi) *They* enjoy the classes
Additional helpful hints for sentences 2-10
Discuss whether/how your analysis can account for the (un)grammaticality of the sentences below.

2a) We have fun and some pain
2b) *We’ve fun
2c) We have fun and are enjoying syntax
2d) We have fun but will it last?

3a) Voters and most journalists know politicians lie
3b) Voters know politicians lie and can’t be trusted
3c) Voters know politicians lie and don’t trust them
3d) Voters know politicians lie and that they do so knowingly
3e) Voters know politicians lie, but do they care?

4a) John promised to behave himself, but will he do so?
4b) John and the vicar promised to behave themselves
4c) John promised to behave himself and has done so
4d) What John promised was to behave himself
4e) John promised to behave himself (How come himself refers to John?)

5a) She sees no need for him to apologise, but does she think he will?
5b) She sees no need for him to apologise, and would not want him to

6a) They would prefer very much for students to do exams
6b) They would prefer students to do exams and for their exam papers to remain confidential
6c) What they would much prefer is for students to do exams
6d) *Students would be preferred to do exams

7a) Salaries are expected to rise
7b) *They expect salaries to rise and for inflation to fall
7c) They expect salaries to rise and inflation to fall
7d) *They expect confidently for salaries to arise (Cf. They confidently expect salaries to rise)

8a) He might like more than anything for you to talk to her
8b) He might like you to talk to her and for things to be settled between you
8c) What he might like is for you to talk to her
8d) *You might be liked to talk to her

9a) I have known you to have a tantrum (on occasions)
9b) *I’ve known you’ve a tantrum (on occasions)
9c) I’ve never know him be rude to you, or you to be rude to him
9d) You have been known to have a tantrum (cf. *You have been known have a tantrum)
9e) *I’ve known you have a tantrum and for other people to get upset
9f) *I’ve known occasionally for you to have a tantrum (OK = I’ve occasionally known you have a tantrum)

10a) What John wanted was to help him
10b) John wanted to help him (Why can’t him refer to John?)

Exercise 3.2
Account for the (un)grammaticality of the bracketed infinitive complement clause structures in the following sentences in standard varieties of English:

1a) They were planning [to escape]  
   b) *They were planning [him to escape]
2a) We consider [him to be unsuitable]  
   b) *It is considered [him to be unsuitable]
3a) He would like [me to leave]  
   b) He would like [to leave]
4a) She seems keen [for them to participate]  
   b) *She seems keen [for to participate]
5a) I received a request [to resign]  
   b) *I received a request [him to resign]
6a It was agreed [to review the policy]  |  b *It was agreed [us to review the policy]
7a Congress decided [to ratify the treaty] |  b *Congress decided [for him to ratify the treaty]
8a She expected [to win the nomination]  |  b She expected [him/*he to win the nomination]
9a He should let [you have a break]     |  b *He should let [have a break]
10a *He said [her to like oysters]      |  b *He said [to like oysters]

In addition, say how you would analyse structures like (4b) in varieties of English (like Belfast English) in which they are grammatical and have a meaning roughly paraphrasable as ‘She seems keen for herself to participate’. What if for-to can serve as a compound T constituent in such sentences in the relevant varieties (and likewise in sentences such as I wanted Jimmy for to come with me, from Henry 1995, p. 85)?

Helpful hints
Note that (1b) is intended to have an interpretation paraphrasable as ‘They were planning for him to escape’, (9b) to have an interpretation paraphrasable as ‘He should let himself have a break’, (10a) to have an interpretation paraphrasable as ‘He said she liked oysters’, and (10b) to have an interpretation paraphrasable as ‘He said he liked oysters’ (where the two occurrences of he refer to the same individual). Assume that each of the italicised words in the above examples has its own idiosyncratic selectional properties, and that the selectional properties of any word W are described by saying: ‘W selects as its complement an expression headed by …’ (where in place of the dots you insert the features characterising the relevant head). So, you might say e.g. that a verb like arrange can select a complement headed by an infinitival complementiser (either the transitive infinitival complementiser for or the null intransitive infinitival complementiser ø), whereas an ECM verb like believe selects a complement headed by the infinitival to. By contrast, other verbs (it might turn out) don’t select a particular kind of infinitive complement – or indeed any kind of infinitive complement. Assume that the seemingly subjectless clauses in 1-10 (whether grammatical or not) have a null PRO subject. Pay attention (i) to the selectional properties of the italicised words and (ii) to the case properties of the subjects of the bracketed complement clauses. In the case of the ungrammatical examples, consider whether the ungrammaticality is attributable to a selectional error (in that the italicised word is used with a kind of complement which it does not select/allow) or a case error (in that the subject of the bracketed complement clause has a case which it cannot be assigned in accordance with the case conditions given in the main text) – or both.

Model answer for (1)
Given the CP analysis of finite clauses and control clauses in the text, 1a will have the structure (i) below:

```
(i)  CP
     C
      Ø
     PRN
      T
       were
     T
      V
       VP
        planning
         CP
          C
           Ø
          PRN
           PRO
            T
             to
              escape
```

The null complementiser introducing the CP complement of the verb planning is intransitive and non-finite, and accordingly assigns null case to the PRO subject which it c-commands. Support for the CP analysis of the bracketed complement clause to escape in 1a comes from the fact that (like other CPs, but unlike TPs) it can serve as the focused constituent in pseudo-cleft sentences like:
(ii) What they were planning was to escape
The fact that it is also possible to say:

(iii) They were planning for him to escape
suggestions that plan can also select a complement headed by the transitive infinitival complementiser for. This leads to the greater generalisation that plan can select a CP complement headed by an infinitival complementiser (either the transitive infinitival complementiser for or the null intransitive infinitival complementiser ø). The ungrammaticality of 1b *They were planning him to escape could be attributable to a case error (if the null complementiser heading the complement clause is intransitive and so assigns null case to the infinitive subject), or to a spellout error (if the complementiser heading the complement clause is the kind of for complementiser which can never be given a null spellout – unlike the for introducing an infinitival complement of a verb like want).
4

Head Movement

4.1 Overview
So far, we have examined a range of syntactic structures which are derived by a series of merger operations. We now go on to look at structures whose derivation involves not only merger but also a specific type of movement operation called head movement. In this chapter, we focus mainly on two specific types of head movement operation, one which affects auxiliaries in present-day English, and another which affected main verbs in earlier stages of English; we also look briefly at how head movement can apply to nouns.

4.2 T-to-C movement
In chapters 2 and 3, we saw that complementisers are positioned in front of subjects in the clauses they introduce. More specifically, we suggested that complementisers head a separate projection in clauses which we termed a complementiser phrase/CP, with the head C position of CP being filled by a complementiser like that/for/if. However, complementisers are not the only kind of word which can precede subjects in clauses. As we saw in our brief discussion of questions in §3.6, auxiliaries can also precede subjects in yes-no questions such as Do you feel like a Coke? In this respect, inverted auxiliaries seem to resemble complementisers – as the following (love-struck, soap-operesque) dialogue illustrates:

(1) SPEAKER A: Honey-buns, there’s something I wanted to ask you
SPEAKER B: What, sweetie-pie?
SPEAKER A: If you will marry me
SPEAKER B: (pretending not to hear): What d’you say, darlin’?
SPEAKER A: Will you marry me?

What’s the structure of the two bold(-printed) proposals which speaker A makes in (1)? The answer is straightforward enough in the case of If you will marry me: it’s a clause introduced by the interrogative complementiser/C if, and so is a complementiser phrase/CP constituent with the structure (2) below:

(2) CP
   /|
   / |
  C TP
     /|
     / |
    if PRN
       /|
       / |
      you T
         /|
         / |
        T’ VP
           /|
           / |
          will V
             /|
             / |
            marry PRN
               /|
               / |
              me

But now consider the structure of the second proposal Will you marry me? What position is occupied by the inverted auxiliary will? Since will appears to occupy the same pre-subject position that the complementiser if occupies in (2), a plausible suggestion to make is that the inverted auxiliary actually occupies the head C position of CP. If this is so, we’d expect will and if to be mutually exclusive (on the assumption that we can only insert one word in a given head-position like C, not two words): in other words, if both complementisers and inverted auxiliaries occupy the head C position of CP, we’d expect to find that a question can be introduced either by a complementiser or by a preposed auxiliary – but not by the two together. This is indeed the case, as we see from the ungrammaticality of speaker B’s reply in (3) below:

(3) SPEAKER A: What d’you want to ask me?
SPEAKER B: *If will you marry me
The fact that questions can’t contain both a complementiser and an inverted auxiliary provides us with empirical evidence that inverted auxiliaries occupy the same structural position as complementisers – i.e. that both occupy the head C position of CP.

But how can a finite auxiliary (which normally occupies the head T position of TP) come to be positioned in the head C position of CP? The conventional answer is that auxiliaries in questions move out of their normal post-subject position into pre-subject position by a movement operation which in chapter 1 we referred to as auxiliary inversion. Given our assumption that an inverted auxiliary occupies the head C position of CP, this means that the auxiliary moves from the head T position in TP into the head C position in CP, as shown by the arrow in (4) below:

(4)

\[
\begin{array}{c}
C \\
\uparrow \\
CP \\
\end{array} \\
\begin{array}{c}
TP \\
\end{array} \\
\begin{array}{c}
PRN \\
you \\
\end{array} \\
\begin{array}{c}
T^* \\
will \\
\end{array} \\
\begin{array}{c}
VP \\
marry \\
me \\
\end{array} \\
\end{array}
\]

Hence, auxiliary inversion in questions involves **T-to-C movement**.

An important question which is begged by the T-to-C movement analysis is *why* auxiliaries should move from T to C in main-clause questions. Using a metaphor adopted by Chomsky (1995), we can say that C is a **strong** head in interrogative main clauses in English and that a strong head position has to be filled (i.e. occupied) by an overt constituent of an appropriate kind. In a complement-clause yes-no question like that bracketed in:

(5) He asked [if I would marry him]

C is filled by the complementiser *if* – and indeed speaker A’s first proposal in (1) might be regarded as an elliptical form of *I wanted to ask you [if you will marry me]*, with *if* introducing the bracketed complement clause, and constituents other than those of the bracketed clause undergoing ellipsis. However, complementisers like *if* can’t be used to introduce main clauses in English, so the strong head C position is instead filled by moving an auxiliary from T to C (i.e. via auxiliary inversion).

In order to understand the mechanics of auxiliary inversion, let’s look in rather more detail at the derivation of (1) *Will you marry me?* The verb *marry* merges with the pronoun *me* to form the VP *marry me*. This VP is then merged with the T-auxiliary *will* to form the T-bar *will marry me*, and this T-bar is in turn merged with the pronoun *you* to form the TP *you will marry me*. The resulting TP is then merged with a strong null interrogative complementiser ø to form the CP ø *you will marry me*. Being strong, the null complementiser attracts the auxiliary *will* to move from T to C to attach to it, thereby filling the C position.

But why should the null complementiser attract the auxiliary *will* to move from T to C? One possibility is to follow Chomsky (1995) in supposing that the null complementiser in an interrogative main clause is **affixal** in nature, and attracts an overt head to attach to it. Since affixes generally only attach to a particular kind of host (e.g. the past tense -*d* affix can attach to verbs but not nouns, prepositions or adjectives), and since only **tensed** (i.e. present or past tense) auxiliaries move to C, one implementation of this idea (adapted from Chomsky 1993) is to suppose that the affix carries a tense feature – below denoted as [TNS] – which requires it to attach to a tensed host (i.e. to a present or past tense T constituent). If we suppose that the affix in C in main-clause questions is strong, it will attract the head T constituent of TP to move from T in order to attach to the affix in C, thereby satisfying the requirement for the affix in C to be attached to a tensed host. Thus, at the stage where the null interrogative complementiser is merged with its TP complement, we have the structure (6) below (where ø is a strong affix with a TNS feature requiring it to attach to a tensed host):
The feature on the null affix in C attracts the auxiliary *will* to move from T to C (in the manner shown by the arrow below), and the feature on C is thereby deleted (this being marked by strikethrough) and thereafter becomes inactive, so resulting in the following structure:

\[
\begin{array}{c}
\text{CP} \\
\text{C} [\text{TNS}] \\
\quad \phi \\
\text{TP} \\
\quad \text{PRN} \\
\quad \text{you} \\
\quad \text{T} \quad \text{T}' \\
\quad \text{will} \\
\quad \text{V} \\
\quad \text{PRN} \\
\quad \text{marry} \\
\quad \text{me} \\
\text{VP} \\
\end{array}
\]

The auxiliary *will* moves from T to C in order to satisfy the requirement of the [TNS] feature on the affix for the affixed null interrogative complementiser to have a present or past tense T constituent affixed to it. This results in the formation of a complex C constituent containing the original null complementiser with the preposed T-auxiliary attached to it. The null complementiser thus behaves like an affixal question particle. Such an interrogative affix analysis is far from implausible from a cross-linguistic point of view, in that (e.g.) yes-no questions in Latin could be formed using the overt question suffix *-ne*, and this could attract a finite verb to attach to it. If we adopt the question-affix analysis, we can say that it is the affixal status of an interrogative C (viz. the fact that C in main clause questions contains a null affixal complementiser with a tense feature requiring it to have a T host) which triggers T-to-C movement. Given that English is a largely *suffixal* language (in that it mainly utilises derivational and inflectional suffixes), we can take the null complementiser to be suffixal in nature, so that the attracted auxiliary will end up positioned to the left of it.

### 4.3 Movement as copying and deletion

An interesting question which arises from the T-to-C movement analysis is what it means for the auxiliary to *move out of T*. If movement of an auxiliary from T to C were to result in the head T position of TP vanishing completely, a sentence such as *Will you marry me?* would have the structure shown in simplified form below:

\[
\begin{array}{c}
\text{CP} \\
\text{C} \\
\quad \text{Will} \quad \phi \\
\text{TP} \\
\quad \text{PRN} \\
\quad \text{you} \\
\quad \text{T} \quad \text{T}' \\
\quad \text{will} \\
\quad \text{V} \\
\quad \text{PRN} \\
\quad \text{marry} \\
\quad \text{me} \\
\text{VP} \\
\end{array}
\]

But a structure such as (7) is problematic in that it violates two constituent structure principles which we
posited in §2.2, namely:

(9) **Headedness Principle**
    Every syntactic structure is a projection of a head word

(10) **Binarity Principle**
    Every syntactic structure is binary-branching

A tree such as (8) would violate the headedness requirement (9) in that neither TP nor T-bar has a head T constituent; (8) would also violate the binarity requirement (10) in that T-bar is not binary-branching (since T-bar does not have two daughters) but rather unary-branching (since T-bar has only one daughter).

It seems clear, then, that movement of an auxiliary from T to C cannot result in the loss of the original T constituent which heads TP: so, T must remain in place in the form of a **null** constituent of some kind. But what kind of item could the relevant null T constituent contain? Our discussion of **gapping** (i.e. head ellipsis) in the previous chapter suggests a possible answer. In §3.4 we suggested that ellipsis of the second (italicised) occurrence of *could* in a sentence such as (11a) below results in a structure such as (11b) containing a null occurrence of *could* (designated as **could**):

(11)(a) He could have helped her, or she could have helped him
   (b) He **could** have helped her, or she **could** have helped him

This raises the possibility that T-to-C movement is a composite operation by which a **copy** of an auxiliary in T is first moved into C, and then the original occurrence of the auxiliary in T is **deleted** (by which we mean that its phonetic features are given a null spellout and so are unpronounced), leaving a null copy of the auxiliary in T. The assumption that movement is a composite operation involving two suboperations of copying and deletion is the cornerstone of Chomsky’s **copy theory of movement**.

If we consider the copying component of movement more carefully, we see that it involves a form of **merger** operation by which a copy of a constituent which has already been merged in one position is subsequently merged in another position. To see what this means, let’s look rather more closely at the derivation of *Will you marry me?* The first stage of derivation involves merging the verb *marry* with the pronoun *me* to form the VP *marry me*; the tense auxiliary *will* then merges with this VP to form the T-bar *will marry me*; this in turn merges with the subject *you* to form the TP *you will marry me*; the resulting TP merges with a C constituent containing the null question affix ø, so that at this stage of derivation we have the simplified structure shown below:

(12)                  CP
    C                          TP
    ø                          PRN
    T                           VP
    you                         will
    T’                           marry me

A copy of the T constituent *will* is then merged with the affixal null interrogative complementiser, so forming a complex C constituent which comprises both the original C constituent containing a null complementiser and the T constituent containing *will*. Subsequent deletion of the phonetic features of the original occurrence of *will* in T derives the structure (13) below:

(13)                  CP
    C                          TP
    T                           C                          PRN
    Will                        ø                          you
    T’                           T                          VP
    will                         will
    marry me
On this view, the inverted auxiliary will undergoes two separate merger operations in (13): first of all it is merged in T with its VP complement marry me, forming the T-bar will marry me; then (a copy of) will is merged with the null interrogative complementiser ø in C, deriving Will+ø you will marry me; subsequent deletion of the phonetic features of the original occurrence of will in T in turn derives Will+ø you will marry me. The resulting structure (13) satisfies both the Headedness Principle (9) and the Binarity Principle (10). Chomsky (2006, p.9) maintains that considerations of computational efficiency determine that only one copy of a moved constituent is overtly spelled out (since this minimises the amount of material to be pronounced), and that considerations of optimal design dictate that the highest copy is the one which is overtly spelled out, since otherwise movement would be undetectable.

An interesting source of evidence in support of the copy theory of movement comes from the study of language acquisition. Young children sometimes produce auxiliary copying structures like the following (produced by a boy called Sam at age 2 years and 9 months: thanks to Ian Crookston for the data):

(14)(a) Can its wheels can spin? (b) Did the kitchen light did flash?
(c) Is the steam is hot? (d) Was that was Anna?

What is Sam doing here? The answer seems to be that he has mastered the copy-merge component of auxiliary inversion and so is able to merge a copy of will in C: but he has not yet mastered the copy deletion component of auxiliary inversion and so fails to delete the phonetic features of the original occurrence of the auxiliary in T. Accordingly, (14a) above has the simplified structure (15) below for Sam (in which the structure of the DP its wheels is not shown because it is irrelevant to the point at hand):

(15)

The fact that Sam seems to have mastered the merger operation involved in auxiliary inversion (i.e. merging an auxiliary in T and then merging a copy of the auxiliary in C) but not the deletion operation (in that he fails to delete the original occurrence of the auxiliary in T) suggests that it is plausible to analyse a movement operation like auxiliary inversion as a composite operation involving the two separate operations of copy-merge (i.e. merging a copy of a T-auxiliary in C) and copy-deletion.

In addition to evidence from child grammars we also have evidence from adult grammars in support of the claim that a moved auxiliary leaves behind a null copy of itself. Part of this evidence comes from the phenomenon of have-cliticisation which we touched on in §3.4 and in Exercise 2.2. In this connection, note that have cannot cliticise onto the pronoun I/we/you/they in inversion structures such as:

(16)(a) Should they have/*they’ve called the police?
(b) Will we have/*we’ve finished the rehearsal by 9pm?
(c) Would you have/*you’ve come with me?
(d) Could I have/*I’ve done something to help?

(‘ve represents the vowel-less clitic form /v/ here.) The sequence they’ve in (16a) does not rhyme with grave in careful speech styles, since it is pronounced /ðeɪv/ not /ðerv/. Likewise, the sequence we’ve in (16b) is not homophonous with weave in careful speech styles, since we have in (16a) can be reduced to /weɪv/ but not /wiːv/. Similarly, you’ve doesn’t rhyme with groove in (16c), nor I’ve with hive in (16d). Why should cliticisation of have onto the pronoun be blocked here? We can give a straightforward answer to this question if we posit that when an inverted auxiliary moves from T to C, it leaves behind a null copy of itself in the T position out of which it moves. Given this assumption, a sentence such as (16a) will have the simplified structure shown below (if we assume that have is an AUX heading AUXP, as we will argue in §4.6):
Should + ø T

(17) CP
  C
  TP
  PRN
  T
  AUXP
  have
called the police

In the previous chapter, we characterised have-cliticisation along the following lines:

(18) Have can encliticise onto a pronoun which asymmetrically c-commands have if the pronoun ends in a vowel or diphthong, and if there is no intervening constituent separating the two (i.e. if there is no intervening constituent c-commanding have and c-commanded by the pronoun).

Although in (17) the pronoun *they* ends in a diphthong and asymmetrically c-commands have (in that they c-commands have but have does not c-command *they*), the two are separated by the intervening null auxiliary *should* which occupies the head T position of TP: since *should* c-commands have and is in turn c-commanded by *they*, it intervenes between the two in the relevant technical sense and hence blocks have-cliticisation, thereby accounting for the ungrammaticality of (16a) *Should they've called the police?*

Note that a crucial plank in the argumentation here is the assumption that T-to-C movement leaves behind a null copy of the moved auxiliary in the head T position of TP, and this null auxiliary serves to block cliticisation of have onto a c-commanding pronoun.

Our discussion of auxiliary inversion here has interesting implications for the derivation of sentences. In this connection, consider how we derive a sentence such as:

(19) Can you swim?

The first stage is to go to the *lexicon* (= dictionary) and choose a *lexical array* (i.e. a selection of lexical items out of which the sentence is going to be built). In the case of (19), the lexical array will consist of the verb *swim*, the pronoun *you*, the auxiliary *can*, and a null affixal interrogative complementiser ø. The next stage is for the auxiliary *can* and the verb *swim* to be taken out of the lexical array and merged, so deriving the T-bar *can swim*. The pronoun *you* is then taken from the lexical array, and merged with the T-bar *can swim* to form the TP *you can swim*. The null affixal interrogative complementiser ø is then taken from the lexical array and merged with the TP *you can swim* to form the CP ø *you can swim*. Since the null affix in C has a tense feature attracting a tensed head, it triggers movement of a copy of the present tense auxiliary *can* to adjoin to the null affix ø, forming Can+ø *you can swim*. Subsequent deletion of the original occurrence of *can* in T derives Can+ø *you can swim*.

4.4 V-to-T movement

Having looked at T-to-C movement in English, we now turn to look at a rather different kind of movement operation, which involves *V-to-T movement* – more specifically, movement of a finite main verb from the head V position of VP into the head T position of TP. We shall see that this kind of verb movement operation was productive in *Elizabethan English* (i.e. the English used during the reign of Queen Elizabeth I, when Shakespeare was writing around 400 years ago), but is no longer productive in present-day English. Since part of the evidence for V-to-T movement involves negative sentences, we begin by looking at the syntax of negation.

In Elizabethan English, clauses containing a finite auxiliary are typically negated by positioning *not* between the (italicised) auxiliary and the (bold-printed) verb: cf.

(20)(a) She *shall not see* me (Falstaff, Merry Wives of Windsor, III.iii)
(b) I *will not think* it (Don Pedro, Much Ado About Nothing, III.ii)
(c) Thou *hast not left* the value of a cord (Gratiano, Merchant of Venice, IV.i)
Let’s suppose (for the time being, pending a reanalysis of negation in §4.7) that *not* in Elizabethan English is an adverb which functions as the specifier of the verbal expression following it (e.g. *not* is the specifier of *see me* in (20a) above, and hence modifies *see me*). If so, (20a) will have a structure along the lines of (21) below (where $\phi$ is a null complementiser marking the declarative force of the sentence):

(21)

```
CP
  C
  \phi
TP
  PRN
  she
T'
  T
  shall
  VP
    ADV
    not
    V
    see
    PRN
    me
```

An analysis such as (21) accounts for the position which *not* occupies in front of the verb *see*.

In negative questions, the auxiliary moves from T to C (as in present-day English), leaving *not* in front of the verb: cf.

(22)(a) **Have I not heard the sea rage like an angry boar?** (Petruchio, *Taming of the Shrew*, I.ii)
(b) **Didst thou not hear somebody?** (Borachio, *Much Ado About Nothing*, III.iii)
(c) **Will you not dance?** (King, *Love’s Labour’s Lost*, V.ii)

If questions involve movement of a finite auxiliary from T to C, then a sentence such as (22a) will involve the T-to-C movement operation shown in (23) below (where we take the string *the sea rage like an angry boar* to be an ECM clause headed by a null counterpart of infinitival *to*, symbolised as $\omega$):

(23)

```
CP
  C
  \omega
TP
  PRN
  I
T'
  T
  have
  VP
    ADV
    not
    V
    heard
    PRN
    the sea $\omega$
    TP
    rage like an angry boar
```

The auxiliary *have* originates in T and then moves to C (i.e. a copy of the auxiliary is adjoined to the null affix in C), leaving behind a copy of *have* in T which is ultimately deleted. The assumption that *not* is a VP-specifier provides a straightforward account of the fact that *not* remains positioned in front of the verb *heard* after *have* moves to C.

However, an interesting aspect of negative sentences in Shakespearean English is that in auxiliariless finite clauses like those in (24) below, the (bold-printed) main verb is positioned in front of *not*: cf.

(24)(a) **I care not for her** (Thurio, *Two Gentlemen of Verona*, V.iv)
(b) **He heard not that** (Julia, *Two Gentlemen of Verona*, IV.ii)
(c) **My master seeks not me** (Speed, *Two Gentlemen of Verona*, I.i)
(d) **I know not where to hide my head** (Trinculo, *The Tempest*, II.ii)

If *not* in Elizabethan English is a VP-specifier which is positioned at the leftmost edge of the verb phrase, how can we account for the fact that the verb (which would otherwise be expected to follow the negative
particle *not*) ends up positioned in front of *not* in sentences like (24)? The answer we shall give here is that when a finite T in Elizabethan English contains no auxiliary, the verb moves out of the head V position of VP into the head T position of TP in order to fill T. If so, a sentence like (24a) *I care not for her* will involve the V-to-T movement operation represented by the dotted arrow in (25) below:

(25)

```
CP
  C
  \phi
TP
  PRN
  I
  T'
  T
  VP
  care
  ADV
  V
  PP
  care
```

Thus, the verb *care* is first merged in the head V position within VP, and then moves into the head T position in TP, thereby ending up positioned in front of *not* (with the original occurrence of *care* in V being given a null spellout).

An important theoretical question to ask at this juncture is why the verb *care* should move from V to T. Using Chomsky’s *strength* metaphor, we can suppose that a finite T is *strong* in Elizabethan English and so must be filled: this means that in a sentence in which the T position is not filled by an auxiliary, the verb moves from V to T in order to fill the strong T position. One way of characterising what it means for T to be strong is to suppose that T contains a strong tense affix with a V-feature which requires it to have an (auxiliary or nonauxiliary) verb attached to it as its host. Let’s suppose that a strong affix is one which can find a host either by merger, or by attracting an appropriate item to attach to the affix. So, in a structure like (21), the strong (third person singular present tense) tense affix in T is provided with a host by directly merging the auxiliary *shall* with the tense affix in T, forming *shall*+Af (although the tense affix is not shown in the simplified structure in (21) above); but in a structure like (25), the strong tense affix in T attracts the closest verb which it c-commands (namely the verb *care*) to move to T and attach to the tense affix, so that the affix is provided with a verbal host via movement – as shown in (26) below:

(26)

```
CP
  C
  \phi
TP
  PRN
  I
  T'
  T
  VP
  care+Af_{SgPr}
  ADV
  V
  PP
  care
```

By contrast, T in present-day English contains a *weak* tense affix, and a weak tense affix cannot attract a verb to move from V to T, but rather can only be attached to a verbal host either by merger of an auxiliary like *shall* directly with the null tense affix in T, or by lowering of the tense affix onto the main verb, e.g. in auxiliariless finite clauses such as *He enjoys the classes*. In such auxiliariless clauses, the weak tense affix in T undergoes the morphological operation of *Affix Hopping* in the PF component, lowering the affix
onto the main verb in the manner shown by the arrow in (27) below:

(27)
```
       CP
       |
   C     TP
   |     |
PRN   T
   |   |
  He T'
  |
T' VP
  |
V DP
  |
V'
  |---
  |
ADV V
   |
not
  |
know
  |
know
  |
the cause
```

On this view, both strong and weak Tense affixes can be directly merged with an auxiliary in T; the two differ in how the affix comes to be attached to a main verb; a strong tense affix (like that found in Elizabethan English) triggers movement of the verb from V to T in structures like (26) above; a weak Tense affix (like that found in present-day English) is lowered onto the main verb in the PF component by Affix Hopping in structures like (27) above.

### 4.5 Head movement

There seem to be significant parallels between the kind of movement operation involved in T-to-C movement in (23) on the one hand, and V-to-T movement in (25) on the other. Both operations involve movement of a word from the head position in one phrase into the head position in a higher phrase. Accordingly, in (23) the auxiliary *have* moves from the head T position of TP into the head C position of CP; and in (25) the verb *care* moves from the head V position of VP into the head T position of TP. This suggests that T-to-C movement and V-to-T movement are two different instances of a more general head movement operation by which an item occupying the head position in a lower phrase is moved into the head position in a higher phrase.

As we see from (23) above, questions in Elizabethan English involved the same inversion operation as in present-day English. Given our assumption that inversion involves movement from T to C, an obvious prediction made by the assumption that verbs move from V to T in Elizabethan English is that they can subsequently move from T to C in interrogatives – and this is indeed the case, as we see from the fact that the (italicised) moved verb ends up positioned in front of its (bold-printed) subject in questions like:

(28)(a) *Saw you my master?* (Speed, *Two Gentlemen of Verona*, I.i)

(b) *Speakest thou in sober meanings?* (Orlando, *As you Like It*, V.ii)

(c) *Know you not the cause?* (Tranio, *Taming of the Shrew*, IV.ii)

(d) *Spake you not these words plain?* (Grumio, *Taming of Shrew*, I.ii)

On the account given here, the derivation of a negative question such as (28c) *Know you not the cause?* will involve the two head movement operations shown in simplified form in (29) below:

(29)
```
       CP
       |
   C     TP
   |     |
PRN   T
   |   |
  you T'
  |
T' VP
  |
V DP
  |
V'
  |---
  |
ADV V
   |
not
  |
know
  |
know
  |
the cause
```
The structure in (29) is simplified for expository purposes by not showing the verb know attaching to a strong tense affix in T, and by not showing movement of the resulting know+Af structure to attach to a strong null interrogative affix $\phi$ in C, forming the structure know+Af+T. The verb know moves from V to T because a finite T is strong in Elizabethan English, by virtue of containing a strong Tense affix with a V-feature; and know subsequently moves from T to C because an interrogative C is likewise strong by virtue of containing a null affix $\phi$ with a strong T-feature. Consequently, know moves through T into C by two successive applications of head movement (numbered (1) and (2) above): know is first merged in V, then moved to T and from there moved to C. In structures like (29), head movement is said to apply in a successive-cyclic fashion, moving the verb know (in successive cycles or steps) first from V to T, and then from T to C. Each time the verb moves, it leaves behind a copy of itself which is eventually deleted.

A key assumption made in (29) is that the verb know moves to C via the intermediate step of moving to T. This raises the question of why know can’t move directly from V to C in the manner shown in simplified form in (30) below:

\[
(30) \quad [\text{CP} \ [C \text{ Know} \ [T \phi] \ [V \text{ not } [V \text{ know} \text{ the cause}]]]]
\]

One way of ruling out the kind of long-distance head-movement operation illustrated in (30) is in terms of a locality principle suggested by Travis (1984), which we can outline in the following terms:

\[
(31) \quad \text{Head Movement Constraint/HMC}
\]

Movement from one head position to another is only possible between a given head and the closest head which asymmetrically c-commands it (i.e. between a given head and the next highest head in the structure containing it)

If we look at the two movement operations in (29), we see that both obey HMC: operation (1) involves local movement of the verb know from the head V position of VP into the next highest head position in the structure, namely the head T position of TP; and operation (2) involves local movement of know from the head T position of TP into the next highest head position in the structure, namely the head C position of CP. Since both head movement operations are strictly local, there is no violation of HMC. By contrast, direct movement of know from V to C in (30) is non-local and violates HMC in that the verb know moves from the head V position of VP directly into the head C position of CP, in spite of the fact that C is not the next highest head above V. (On the contrary, T is the next highest head above V.) HMC therefore provides a principled account of why (28c) Know you not the cause? is ungrammatical in present-day English: the verb know cannot move directly to C (because this would violate the HMC requirement for movement to be local), and cannot move through T into C (because verbs can no longer move from V to T in present-day English).

However, such an analysis raises the question of why finite verbs should be able to move from V to T in Elizabethan English, but not in present-day English. Using Chomsky’s strength metaphor, we can say that the tense affix carried by a finite T was strong in Elizabethan English, but is weak in present day English. Because the affix was strong in finite clauses in Elizabethan English, it could attract a verb to move from V to T; but because the affix is weak in present-day English, T can only be filled by an auxiliary which is directly merged in T, not by a verb moving from V to T. More generally, we can suppose that there is parametric variation with respect to the relative strength of a given type of head, so that (e.g.) a finite T was strong in Elizabethan English but is weak in present-day English. We can refer to the relevant parameter as the Head Strength Parameter. Note that the parameter may have different settings for different types of head in a given language: e.g. a finite T is weak in present-day English, but a finite C is strong in interrogative main clauses.

But why should a finite tense affix be strong in Elizabethan English and weak in present-day English? A suggestion which has been made by a number of linguists (e.g. Platzack and Holmberg 1989, Roberts 1993, Vikner 1997, Rohrbacher 1999, and Koeneman 2000) is that the relative strength or weakness of a tense affix in a language is correlated with the relative richness of the system of subject-agreement inflections which it encodes, in the sense that a tense affix is strong in languages in which finite auxiliaries and verbs carry rich subject-agreement inflections (i.e. in which they carry a wide range of different agreement affixes) and weak in languages in which finite auxiliaries and verbs carry impoverished subject-agreement inflections. In this connection, it is interesting to note that whereas third person singular -s is the only regular agreement inflection found on (present tense) verbs in present-day Standard English,
in Shakespearean English we find four present tense inflections, viz. second person singular -\textit{st}, third person singular -\textit{th} or -\textit{s} (the two being dialectal variants), and third person plural -\textit{n}:

(32)(a) Thou sayst true (Petruchio, \textit{Taming of the Shrew}, IV.iii)  
(b) The sight of love feedeth those in love (Rosalind, \textit{As You Like It}, III.v)  
(c) It looks ill, it eats drily (Parolles, All’s Well That Ends Well, I.i)  
(d) And then the whole quire hold their lips and laugh, and waxen in their mirth (Puck, \textit{Midsummer Night’s Dream}, II.i)

If a tense affix is strong in rich agreement languages and weak in poor agreement languages, we can correlate the strength of T in Elizabethan English with the relative richness of its subject-agreement morphology; and conversely, we can correlate the weakness of T in present-day English with the impoverished nature of its subject-agreement morphology. (See Vikner 1995 and Rohrbacher 1999 for attempts to do this, and Bobaljik 2000 for a dissenting view.)

The relative richness of the agreement features carried by finite verbs in Elizabethan times (as compared to present-day English) is reflected in a further syntactic difference between them. Elizabethan English was a \textbf{null subject language}, and hence allowed finite verbs and finite auxiliaries (like those italicised below) to have null subjects (whether in root/main clauses or not, and whether the subject is sentence-initial or not):

(33)(a) Sufficeth, I am come to keep my word (Petruchio, \textit{Taming of the Shrew}, III.ii)  
(b) Would you would bear your fortunes like a man (Iago, Othello, IV.i)  
(c) Lives, sir (Iago, Othello, IV.i, in reply to ‘How does Lieutenant Cassio?’)  
(d) Hast any more of this? (Trinculo, The Tempest, II.ii)  
(e) After some question with him, was converted (Jacques de Boys, As You Like It, V.iii)  
(f) Had it stretched so far, would have made nature immortal (Countess of Rousillon, All’s Well That Ends Well, I.i)  
(g) You must be so be, if heed me (Antonio, Tempest, II.i)

Since the null subject in sentences like (33) occurs in a nominative position (by virtue of being the subject of a finite clause), it has nominative case and so is different from the ‘big PRO’ subject of infinitives (which has null case), and hence seems to be an instance of the finite ‘little pro’ subject found in null subject languages like Italian – recall our brief discussion of null subjects in §3.2. By contrast, present-day English is a non-null-subject (i.e. \textit{pro}-less) language, so that the present-day counterparts of (33) require (italicised) overt subjects: cf.

(34)(a) It is enough that I have come to keep my word  
(b) I wish you would bear your fortunes like a man  
(c) He is alive, sir  
(d) Have you any more of this?  
(e) After some discussion with him, he was converted  
(f) Had it stretched so far, it would have made nature immortal  
(g) You ought to be like that as well, if you ask me

It would seem, therefore, that a finite T can have a null nominative \textit{pro} subject in a language like Elizabethan English where finite verbs carry rich agreement morphology (and raise to T), but not in a language like present-day English where finite verbs have impoverished agreement morphology (and remain \textit{in situ} – i.e. in the position in which they were originally merged, hence in the head V position of VP). Why should this be? One possibility is that in a language with a rich system of agreement inflections, the agreement inflections on the verb serve to identify the null subject (e.g. the -\textit{st} inflection on \textit{hast} in (33d) is a second person singular inflection, and hence allows us to identify the null \textit{pro} subject as a second person singular subject with the same properties as \textit{thou}). But in a weak-agreement language like contemporary English, agreement morphology is too impoverished to allow identification of a null \textit{pro} subject (e.g. if we asked *Can help? we’d have no way of telling from the agreementless form \textit{can} whether the missing subject is \textit{I}, \textit{you}, \textit{he}, \textit{they} or whatever).

Our discussion here suggests the possibility that there is parametric variation across languages in respect of whether finite verbs carry rich or impoverished subject-agreement morphology, and that the relative richness of agreement morphology correlates with whether the tense affix in T in finite clauses is
strong (and can trigger V-to-T raising) or weak, and with whether a finite T can have a null nominative pro subject or not. In rich agreement languages, a finite T contains a strong tense affix and the main verb raises to T if there is no auxiliary to host the affix in T, enabling the verb to identify the null subject via a local specifier-head relationship (in that the verb is in T and the null subject in spec-T). By contrast, in poor agreement languages, T contains a weak tense affix which is lowered onto the main verb by Affix Hopping if there is no auxiliary in T, with the result that the verb and the null subject are not in a local specifier-head relationship, and the verb cannot identify a null subject. (A minor complication is that poor-agreement languages may have other kinds of null subject: e.g. Japanese and Korean have no agreement morphology except in so-called ‘honorific’ constructions, but allow subjects and objects to be null if they can be discourse-identified – i.e. if their reference can be determined from the discourse context.)

4.6 Auxiliary Raising

Although we assumed in the previous section that no verbs in present-day English can move from V to T, the picture is complicated by the behaviour of be in examples like (35) below:

(35)(a) She may not be suitable
(b) She is not suitable

In (35a) the copular verb be seems to occupy the head V position in VP, and so follows not; but in (35b) is precedes not and so seems to occupy the head T position of TP. This suggests that the copula be originates as a main verb (in the head V position of VP) and remains in situ when non-finite as shown in simplified form in (36a) below, but moves into the head T position of TP when finite as shown in (36b):

(36)(a) \([CP [c \emptyset] [TP she [T may] [VP not [v be] suitable]]]\)
(b) \([CP [c \emptyset] [TP she [T is] [VP not [v is] suitable]]]\)

A similar conclusion is suggested by examples such as the following:

(37)(a) She may not be enjoying syntax
(b) She is not enjoying syntax

In (37a), the head T position of TP is occupied by the modal auxiliary may, and the head V position of VP is occupied by the verb enjoying: the word be therefore seems to occupy some intermediate position between the two. Since be (in this use) is an aspectual auxiliary (marking progressive aspect), let’s suppose that be in (37) occupies the head AUX/Auxiliary position of an AUXP (i.e. Auxiliary Phrase). However, in (37b) progressive is occupies the head T position of TP and hence precedes not. One analysis of the relevant data is to suppose that aspectual be originates as the head AUX constituent of AUXP and remains in situ when non-finite as shown in (38a) below, but moves from AUX to T when finite – as shown in (38b) (where not is taken to occupy a position to the left of AUXP – see the discussion in the next section):

(38)(a) \([CP [c \emptyset] [TP she [T may] not [AUXP [aux be] [VP [v enjoying] syntax]]]]\)
(b) \([CP [c \emptyset] [TP she [T is] not [AUXP [aux is] [VP [v enjoying] syntax]]]]\)

On this view, present-day English would have a be-raising operation moving finite forms of be from the head V position in VP (or the head AUX position in AUXP) into the head T position in TP (an idea which dates back to Klima 1964). This would mean that present-day English retains a last vestige of raising-to-T. The different positions occupied by finite and nonfinite forms of be are mirrored by the perfect auxiliary have – as the examples below illustrate:

(39)(a) He may not have done it
(b) He has not done it

The head T position of TP in (39a) is occupied by may and the head V position of VP by done; hence the infinitive form have must occupy some position intermediate between the two, e.g. the head AUX position of an AUXP/Auxiliary Phrase, as in (40a) below. However the fact that the finite form has in (39b) is positioned in front of not suggests that finite forms of the perfect auxiliary have raise from AUX to T in the manner shown informally in (40b) below:
(40)(a) \[ \text{CP} [\text{C} \; \phi] \; [\text{TP} \; \text{He} [\text{T} \; \text{may} \; \text{not} \; [\text{AUXP} \; [\text{AUX} \; \text{have}] \; [\text{VP} \; [\text{V} \; \text{done}] \; \text{it}]]]] \]

(b) \[ \text{CP} [\text{C} \; \phi] \; [\text{TP} \; \text{He} [\text{T} \; \text{has} \; \text{not} \; [\text{AUXP} \; [\text{AUX} \; \text{have}] \; [\text{VP} \; [\text{V} \; \text{done}] \; \text{it}]]]] \]

So far, we have suggested that the auxiliaries be and have may raise to T from a lower AUX/V position within the clause in present-day English. Roberts (1998) argues that the same is true of some modal auxiliaries as well. In this connection, consider the interpretation of the following negative sentences:

(41)(a) You must not do that (= ‘It is necessary for you not to do that’)

(b) You need not do that (= ‘It is not necessary for you to do that’)

In (41a) the modal must has wide scope with respect to negation (i.e. must has semantic scope over not) whereas in (41b) the modal need has narrow scope with respect to negation (i.e. need falls within the semantic scope of not). Roberts suggests that in sentences like (41) above, wide-scope modals like must are directly generated in T (as in (42a) below) whereas narrow-scope modals like need are initially generated in some position below T (perhaps the head AUX position of an AUXP) and from there move to T (as in (42b) below):

(42)(a) \[ \text{CP} [\text{C} \; \phi] \; [\text{TP} \; \text{you} [\text{T} \; \text{must} \; \text{not} \; [\text{VP} \; [\text{V} \; \text{do}] \; \text{that}]]] \]

(b) \[ \text{CP} [\text{C} \; \phi] \; [\text{TP} \; \text{you} [\text{T} \; \text{need} \; \text{not} \; [\text{AUXP} \; [\text{AUX} \; \text{need}] \; [\text{VP} \; [\text{V} \; \text{do}] \; \text{that}]]]] \]

Roberts’ analysis implies that present-day English has an operation by which narrow-scope auxiliaries raise from AUX to T. An interesting aspect of (42b) is that the polarity item need originates in a position where it is c-commanded by not, so satisfying the c-command requirement on polarity items discussed in exercise 2.2, if we assume that the relevant requirement is that at least one copy of a polarity item must be c-commanded by a negative/interrogative item (the lower copy of need being c-commanded by not in 42b). The two different T/AUX positions for auxiliaries can be occupied by different modals in Scots English structures such as He must no can do it (= ‘It must be the case that he does not have the capability to do it’, from Brown 1991, p.98), with must located in T and having scope over not and can located in AUX and falling within the scope of not.

If finite forms of BE (in all uses), HAVE (in its use as a perfect auxiliary) and narrow-scope modals like need all raise to T, it is clear that the suggestion made in the previous section that T in present-day English is a weak head which does not trigger any form of V-raising is untenable. Rather, the appropriate generalisation would appear to be that in present-day English, only a highly restricted set of verbs (like have, be and need) can raise to T. What do such verbs have in common which differentiates them from other verbs? An answer given by many traditional grammars is that they serve to mark grammatical properties like aspect and modality, and have no inherent lexical content (and for this reason they are sometimes called light verbs), so in this respect they resemble auxiliaries. Adopting this intuition, we can say that the affix in a finite T in present-day English is only strong enough to trigger movement of an auxiliary like have/be/need to T, not movement of a lexical verb to T. This means that if the head immediately beneath T is an auxiliary (as in (36b, 38b, 40b and 42b) above), the affix attracts it; but if the head beneath T is a main verb (as in (27) above), the affix is instead lowered onto the main verb in the PF component by Affix Hopping. Important questions of implementation arise (about what mechanism ensures that an affix in a finite T in present-day English can attract an auxiliary but not a main verb), but I will not go into these here. Perhaps a finite T in present-day English can either be filled by a strong affix which requires an auxiliary as its host, or by a weak affix which requires a main verb as its host. (See Ackema 2001 for an alternative account of auxiliary raising in a different framework.)

The assumption that auxiliaries may originate in a position lower than negation raises interesting questions about the syntax of infinitival to, given the similarities between auxiliaries and infinitival to. In this connection, it is interesting to note that although auxiliaries are positioned above not in finite clauses, infinitival to is generally positioned below not – as we see from sentences like (43) below:

(43) John ought not to say anything

Here, ought is a modal auxiliary which occupies the head T position of TP; we can see that it is an
auxiliary from the fact that like typical auxiliaries, it allows negative cliticisation (giving rise to *oughtn’t*). However, if (43) is a single clause, if no clause can contain more than one T constituent, and if *ought* occupies the head T position of TP, it follows that infinitival *to* cannot occupy the head T position of TP but rather must occupy some lower position. One possibility is that *to* originates in the same AUX position as narrow-scope modal, so that (43) has the structure shown in skeletal form in (44) below:

(44) \[
\text{[CP [C ø] [TP \{John [T ought] not [AUXP \{AUX to} say anything\}]}}
\]

However, although *not* is the normal word order in negative infinitives, the alternative order *to not* is also found, as the examples below illustrate:

(45)(a) He decided [not to co-operate with the police]
(b) He decided [to not co-operate with the police]

It seems reasonable to suppose that the two different word orders in the bracketed complement clauses in (45a/b) reflect two different positions occupied by infinitival *to*, as suggested in (46a/b) below:

(46)(a) \[
\text{[CP [C ø] [TP PRO \{y ø} not [AUXP \{AUX to} co-operate with the police\}]}}
\]

(b) \[
\text{[CP [C ø] [TP PRO \{y to} not co-operate with the police\}]]}
\]

There is a subtle meaning difference between the two examples: (45b) implies a much more deliberate act of defiance than (45a). Given the analysis suggested in (46), this meaning difference can be attributed to a scope difference, with *not* c-commanding and so having scope over *to* in (46a), and *to* c-commanding and having scope over *not* in (46b). A similar scope difference is found between *will* and *not* in sentences like:

(47)(a) He almost certainly won’t co-operate with the police
(b) He will almost certainly not co-operate with the police

In (47a), *not* has semantic scope over *will* and the sentence is paraphraseable as ‘It is almost certainly not the case that he will co-operate with the police’, whereas in (47b) *will* has scope over *not* and the sentence is paraphraseable as ‘It will almost certainly be the case that he does not co-operate with the police.’

Although there are in principle two distinct positions which auxiliaries and infinitival *to* can occupy within clauses (viz. the head AUX position of AUXP, and the head T position of TP), if these two positions correlate directly with scope, it is plausible to assume that a given lexical item L (where L is a finite auxiliary or infinitival *to*) is only projected in the head AUX position of AUXP if L falls within the scope of an element like *not* which has scope over L but not over T, and that otherwise L is directly projected in the head T position of TP (and the sentence then contains no AUXP projection associated with L). In other words, in negative clauses like (42b) and (46b) in which the negative adverb *not* has scope over a narrow-scope auxiliary like *need* or infinitival *to*, the relevant item is generated in the head AUX position of AUXP, but in non-negative structures like (48) below:

(48) \[
\text{[He may decide [to quit his job]]}
\]

the auxiliary *may* and the infinitival participle *to* are directly generated in the head T position of TP of the respective bracketed clauses containing them, and neither clause contains an AUXP constituent (if AUX is only projected where required for scope purposes). One way of thinking of this is to suppose that AUX and T are syncretised (i.e. collapsed into a single T head) in structures in which there is no constituent intervening between the two. By contrast, non-finite auxiliaries (e.g. like *be in He may be lying or He seems to be lying*) always occupy the head AUX position of AUXP and never move into T; this may also be the case with subjunctive auxiliaries like that italicised in ‘They demanded that he not *be* released’.

### 4.7 Another look at Negation

In §4.4 and §4.5 we assumed that the negative particle *not* is a VP-specifier which occupies initial position within VP. However, this assumption is problematic in a number of respects, as should be apparent if you look back at (38), (40), (42), (44) and (46a) in §4.6. For example, in a sentence such as (37a) *She may not be enjoying syntax*, it is clear that *not* does not occupy a VP-initial position immediately in front of the verb *enjoying*: on the contrary, *not* appears to occupy some position between the modal auxiliary *may* and the aspectual auxiliary *be* – as shown in (38a). Moreover, we shall argue in chapter 6 that only an argument of a verb can occupy the specifier position within VP – and *not* in a negative...
sentence like *She may not sell it* is not an argument of the verb *sell* (because *not* isn’t one of the participants in the act of selling). It is clear, therefore, that we need to rethink our earlier analysis of negation. An alternative analysis which has been proposed in work dating back to Pollock (1989) is that *not* is contained within a separate NEGP/Negation Phrase projection, and that *not* serves as the specifier of NEGP (and hence is positioned in spec-NEGP); this has subsequently become a standard analysis of negation. (See Ingham 2000 for evidence of a NEGP constituent in Late Middle English; and see Haegeman 1995 for a wide-ranging account of the syntax of negation.)

Such an analysis is far from implausible from a historical perspective: in earlier varieties of English, sentences containing *not* also contained the negative particle *ne* (with *ne* arguably serving as the head NEG constituent of NEGP and *not* as its specifier). This can be illustrated by the following Middle English example taken from Chaucer’s *Wife of Bath’s Tale*:

(49) A lord in his houshold *ne* hath *nat* every vessel al of gold (lines 99-100)

‘A lord in his household does not have all his vessels made entirely of gold’

A plausible analysis of a sentence like (49) is to suppose that *ne* originates as the head NEG constituent of NEGP, with *nat* (= ‘not’) as its specifier: the verb *hath* originates in the head V position of VP and from there moves to the head NEG position of NEGP, attaching to the negative prefix *ne* to form the complex head *ne+hath* as shown in simplified form in (50) below:

(50) \[
\begin{array}{l}
\text{NEGP} \ [\text{NEG} \ \text{ne+} \ \text{hath}] \\
\text{VP} \ [\text{V} \ \text{hath}] \ \\
\text{every vessel al of gold}
\end{array}
\]

The resulting complex head *ne+hath* then attaches to a present-tense affix (Af) in T, as shown in simplified (and abbreviated) form in (51) below:

(51) \[
\begin{array}{l}
\text{TP} \ A \ lord... \ [T \ \text{ne+} \ \text{hath}+\text{Af}] \\
\text{NEGP} \ [\text{NEG} \ \text{ne+} \ \text{hath}] \\
\text{VP} \ [\text{V} \ \text{hath}] \ \\
\text{every vessel al of gold}
\end{array}
\]

Merger of the TP in (51) with a null declarative complementiser will derive the CP structure associated with (49) *A lord in his houshold ne hath nat every vessel al of gold*.

By Shakespeare’s time, *ne* had dropped out of use, leaving the head NEG position of NEGP null (just as in *ne...pas* ‘not….at.all’ negatives in present-day French, *ne* has dropped out of use in colloquial styles). Positing that *not* in Elizabethan English is the specifier of a NEGP headed by a null NEG constituent opens up the possibility that V moves through NEG into T, so that (24a) *I care not for her* has the derivation shown (in simplified form) in (52) below:

(52) \[
\begin{array}{l}
\text{CP} \ \\
\text{TP} \ \\
\text{PRN I} \\
\text{T} \ \\
\text{NEG} \ [\text{ADV not}] \\
\text{NEG'} \ [\text{V} \ \text{care}] \ \\
\text{VP} \ [\text{PP for her}]
\end{array}
\]

This would mean that head movement applies in a **successive-cyclic** (two-step) fashion. Each of the two head movement operations in (52) – viz movement of *care* from V to NEG, and then from NEG to T – is local in the sense that it satisfies the **Head Movement Constraint** (31), since in each case movement is from one head position into the next highest head position in the structure. If head movement is driven by affixal properties of heads, and if both T and NEG contain a strong affix with a V-feature which can trigger movement of a main verb, the verb *care* will first move from V to NEG in order to attach to a null negative affix (in much the same way as the verb *hath* in (50) moves from V to Neg to attach to the overt negative affix *ne*), and the resulting complex NEG head (comprising a null negative affix with a verb attached to it) in turn will move from NEG to T in order to attach to a strong tense affix in T.
An important question posed by the analysis in (52) is why sentences like (24a) *I care not for her* are ungrammatical in present-day English. The answer is that neither T nor NEG contains a strong affix with a V-feature in present day English, and so they are unable to attract a main verb like *care* to move through NEG into T. Still, this assumption in turn raises the question of why we can’t simply leave the present tense verb *care* in situ (in the head V position of VP) in present-day English – as in (53) below:

(53)  \[ CP [C \ø] [TP I [T Af] [NEG not [NEG \ø] [VP [V care] for her]]]]

One answer is the following. Let’s suppose that (just like syntactic operations), morphological and phonological operations in the PF component apply in a **bottom-up** fashion, and process structures in a **cyclic** fashion (i.e. in a stepwise fashion, one projection at a time). What this means is that when the syntax hands over the structure in (53) to the PF component, the lowest maximal projection in the structure (the VP *care for her*) will be processed first, then the next lowest maximal projection (the NEGP *not \ø care for her*), then the next lowest maximal projection (the TP *I Af not \ø care for her*) and finally the overall CP (*\ø I Af not \ø care for her*). Let’s also posit that all operations (whether syntactic, morphological, or phonological) are subject to Pesetsky’s (1995) **Earliness Principle**, which we outlined informally in §3.9 as follows:

(54)  **Earliness Principle**

Operations must apply as early as possible in a derivation

All of this means that **Affix Hopping** will apply to the tense affix in (53) on the TP cycle – i.e. at the point where we have already processed VP and NEGP, and are now beginning to process TP. The structure which the PF component can ‘see’ on the TP cycle is (55) below:

(55)  \[ TP I [T Af] [NEG not [NEG \ø] [VP [V care] for her]]]]

At this point, we might expect Affix Hopping to apply to lower the tense affix in T onto the verb *care*. There are two possible ways in which we might seek to achieve this. One is by lowering the affix directly from T onto V as in (56a) below, and the other is to lower the affix first onto null NEG head and then onto V in the manner shown in (56b):

![Diagram of Affix Hopping](image)

(56)(a)  \[ TP I [T Af] [NEG not [NEG \ø] [VP [V care] for her]]]]

(b)  \[ TP I [T Af] [NEG not [NEG \ø] [VP [V care] for her]]]]

However, a movement operation like (56a) which lowers the affix directly from T onto V would violate the **Head Movement Constraint** (31), since it involves lowering the head T of TP onto the head V of VP; and yet V is not the next lowest head in the structure (rather, NEG is), and HMC only allows a head to be lowered onto the head immediately beneath it in the structure. Accordingly, we might suppose that Affix Hopping applies in a successive cyclic fashion, lowering the affix first from T onto NEG, and then from NEG onto V – as in (56b). However, there are two problems posed by any such successive-cyclic lowering operation. The first is that NEG doesn’t seem to be the kind of head which is an appropriate host for a Tense affix (at least, if we assume that a tense affix attaches to an overt verb, since NEG is neither overt nor a verb): hence, the first step of the two-step movement arrowed in (56b) – namely lowering the Affix onto NEG – may perhaps be ruled out for this reason. To make matters worse, the second step of lowering the tense affix from NEG onto V in (56b) is also ruled out, because it violates a UG principle traditionally referred to as the **Strict Cyclicity Principle**, outlined informally below:

(57)  **Strict Cyclicity Principle/SCP**

At a stage of derivation where a given projection HP is being cycled/processed, only operations affecting the head H of HP and some other constituent of HP can apply

Lowering the tense affix from T onto NEG in (56b) does not violate SCP, since T-to-NEG lowering clearly affects T (by moving the tense affix in T) and also affects a NEG constituent which is contained within TP (since this ends up having a tense affix attached to it). But the subsequent operation of lowering the affix from NEG onto V is **anticyclic**, since NEG-to-V lowering does not affect T (in violation of SCP),
but rather affects only NEG and V. We therefore correctly predict that sentences like *I not care for her are ungrammatical in present-day English. (See also Lasnik 1995, 2000; Ochi 1999.)

A final point to be made here is that we have excluded from our discussion negative interrogatives like Shouldn’t you be at work? Cormack and Smith (2000a) argue that in such sentences the negative particle n’t has scope over the modal (so that the sentence has a meaning paraphraseable as ‘Is it not the case that you should be at work?’) and hence originates in a position above TP. One proposal along these lines would be to suppose that NEGP in such sentences is positioned between CP and TP, and that the auxiliary should raises from T through NEG into C, with n’t cliticising onto the auxiliary. This would allow for the possibility of two types of negation occurring in a sentence such as Mightn’t he not have seen her? where not originates within a NEGP immediately above VP, and n’t within a NEGP immediately above TP.

4.8 Do-support

In present-day English, the negative counterpart of a sentence like I care for her requires DO-support, as we see from (58) below:

(58) I do not care for her

But how does DO come to appear in such sentences – and why? In order to answer this question, let’s look rather more closely at the derivation of sentence (58). Suppose that (as before) the syntactic component of our grammar generates the structure (53) above, repeated as (59) below:

(59) \[CP [C ø] [TP I [T Af] [NEGP not [NEG ø] [VP [V care] for her]]]]

Since T contains an unattached weak tense affix with a V-feature requiring it to attach to a verbal host, we would expect the affix to be lowered onto an overt verbal stem by Affix Hopping. But if Affix Hopping is a purely local operation which lowers an unattached weak tense affix onto the closest head asymmetrically c-commanded by T (hence onto the head word of the expression which is the complement of T), then it follows that all Affix Hopping can do is lower the affix onto the head NEG constituent of NEGP. But, as we have already seen, NEG is arguably not an appropriate host for the affix, since it is neither overt nor verbal. The result is that the affix in T remains stranded (i.e. left without a verbal host to attach to). Let us suppose that when an affix is attached to an (auxiliary or main) verb host, the resulting VERB+AFFIX substructure is spelled out as an appropriately inflected form of the relevant verb (e.g. WAIT+Af3.SG.PRES is spelled out as the regular form waits, whereas BE+Af3.SG.PRES is spelled out as the irregular form is).

However, let us further suppose that when a tense affix is stranded (i.e. unable to find a verbal host to attach to), it is spelled out as an appropriately inflected form of the dummy/expletive auxiliary DO. This being so, the first person singular present tense affix in stranded in C in (59) will be spelled out as the first person singular present tense form of DO (namely do) – as in (60) below:

(60) \[CP [C ø] [TP I [T do] [NEGP not [NEG ø] [VP [V care] for her]]]]

On this view, there is no DO-insertion operation in the syntax or morphology (somehow inserting the stem DO into a structure which previously did not contain it); rather a form like do in a structure like (60) is simply the spellout of a stranded affix.

What is implicitly being assumed here is that Affix Hopping and Do-Support are complementary PF operations which provide two different ways of spelling out an affix. We can therefore see them as two facets of an Affix Attachment operation, as in (61) below:

(61) Affix Attachment

When the PF component processes a structure whose head H contains an (undeleted) weak affix which needs a verbal host and which is not already attached to an (auxiliary or main) verb

(i) if H has a complement headed by an overt verb, the affix is lowered onto the relevant verb [= Affix Hopping]

(ii) if not (i.e. if H does not have a complement headed by an overt verb and the affix is stranded), the affix is spelled out as an appropriately inflected form of DO [= DO-support]

We can illustrate how (61) works in terms of the italicised structures below:
Consider first (62a), which is derived as follows. The determiner the merges with the noun race to form the DP the race; the verb win merges with this DP to form the VP win the race. This VP is merged with a T constituent containing a (past tense) affix Af to form the T-bar Af win the race. This T-bar merges with the pronoun he to form the TP he Af win the race; and the resulting TP in turn is merged with a null declarative complementiser φ to form the CP shown in skeletal form in (63) below:

\[ (63) \text{[CP [c φ] [TP He [T Af] [VP [v win the race]]]}} \]

The syntactic structure (63) is then sent to the PF component (and the semantic component) to be processed. PF operations apply in a bottom-up, cyclic fashion. On the TP cycle in the PF component, the tense affix in T is lowered onto the verb win in accordance with (61i), so that the verb has the form win+Af; since the lexical entry for the irregular verb win specifies that it is spelled out as won when it has a past tense affix attached to it, the overall structure is eventually spelled out as (62a) He won the race.

Now consider why do is used in the elliptical clause he did in (62b). This has the syntactic structure shown in (64) below, with the italicised material undergoing ellipsis:

\[ (64) \text{[CP [c φ] [TP he [T Af] [VP [v win the race]]]}} \]

The tense affix in T cannot subsequently be lowered onto the verb win in the PF component via the Affix Hopping operation (61i) because an affix can only attach to an overt verb and the verb win in (64) is not overt (by virtue of having undergone ellipsis); hence the Do Support operation in (61ii) has to apply, spelling out the unattached affix as an appropriately inflected form of do – namely did.

Now consider the clause Win the race, he did in (62c). Let’s suppose that (in the syntax) the VP win the race undergoes preposing in order to highlight it, and is thereby moved to the front of the overall clause (to become the specifier of the null complementiser), and that the phonetic features of the original occurrence of the VP win the race are given a null spellout, as shown informally in (65) below:

\[ (65) \text{[CP [v win the race] [c φ] [TP he [T Af] [VP [v win the race]]]}} \]

Once again, in the PF component the weak tense affix in T cannot be lowered onto the verb win because the complement of T is a VP which contains a null copy of the verb win (the overall VP having moved to the front of the sentence, leaving a null copy behind). Accordingly, Do Support (61ii) applies once again, and the affix in T is spelled out as did.

Let’s turn now to look at the derivation of the yes-no question (62d) Did he win the race? Let’s suppose that a series of syntactic merger operations have applied to generate the structure (66) below:

\[ (66) \text{[CP [c φ] [TP he [T Af] [VP [v win the race]]]}} \]

Let’s further suppose that the interrogative C contains a strong null affix φ with a tense feature (requiring it to attach to a T constituent) and hence attracts whatever is contained within T to adjoin to it. Since T in (66) contains only a tense affix, this affix will adjoin to the null affixal complementiser (and the original occurrence of the affix in T will be deleted), so deriving the structure (67) below:

\[ (67) \text{[CP [c Af+Q] [TP he [T Af] [VP [v win the race]]]}} \]

The resulting syntactic structure is then sent to the PF component to undergo morphological and phonological processing. Since the tense affix in T gets deleted, it does not undergo Affix Hopping. By contrast, the tense affix (Af) in C is not deleted and is unhosted (in the sense that it is not attached to the kind of verbal host that it requires), and hence must undergo Affix Attachment (61). However, since the complement of the C constituent which contains the tense affix is not headed by an overt verb (but rather is a TP headed by a null T), Affix Hopping (61i) cannot apply; consequently, Do Support (61ii) applies instead, with the result that the affix is spelled out as the appropriate inflected form of do, namely did.

Now, consider the negative question (62e) Didn’t he win the race? In keeping with the NEGP analysis of negation outlined in the previous section, let’s suppose that after the VP win the race has been formed,
it is merged with a neg head \( \theta \) to form a NEG-bar constituent, and that this in turn is merged with a negative clitic \( n't \) which serves as its specifier, forming the NEG-bar \( n't \theta \) win the race. This NEG-bar is then merged with a T containing an abstract tense affix, forming the T-bar \( Af+n't \theta \) win the race. Suppose that the negative \( n't \) then attaches to the end of the tense affix, with the original occurrence of \( n't \) in spec-NEG-bar ultimately being deleted, so forming the string \( Af+n't \theta \) win the race. The resulting T-bar is in turn merged with the subject he, forming the TP \( He Af+n't \theta \) win the race. This is then merged with an interrogative C constituent containing a null affix \( \theta \), forming the CP (68) below:

\[
(68) \quad [CP [C \theta] [TP he [T Af+n't]] [NEG \theta] [VP \{v \text{ win} \text{ the race}\}]]
\]

Since the null affix in C is strong and has a tense feature, it attracts all the material contained in T to adjoin to it, so deriving:

\[
(69) \quad [CP [C Af+n't+\theta] [TP he [T Af+n't+\theta]] [NEG \theta] [VP \{v \text{ win} \text{ the race}\}]]
\]

The resulting syntactic structure is then handed over to the PF component. On the CP cycle in the PF component, the tense affix in C will be subject to Affix Attachment (61). However, since the complement of C is not a VP headed by an overt verb, Affix Hopping (61i) cannot apply, and DO-Support (61ii) applies instead (with the affix being spelled out as an appropriate form of DO), creating the complex head \( DO+n't+\theta \), which is ultimately spelled out as didn’t.

An interesting descriptive implication of the analysis presented in (69) is that it is in principle possible that the interrogative form of some auxiliaries may have a different spellout from their non-interrogative counterparts. This is because in their interrogative form they attach to a null affixal interrogative complementiser \( \theta \), whereas in their non-interrogative form they do not. A case in point is be. When used with a first person singular subject (= I), this has the negative interrogative form aren’t – a form which is not found with an I subject (in varieties of English like mine) in non-interrogative uses, as the following contrast shows:

\[(70)\text{(a)}\quad \text{Aren’t I entitled to claim Social Security benefits?}
\]

\[(70)\text{(b)}\quad \text{*I aren’t entitled to claim Social Security benefits (= I’m not…)}
\]

This can be accounted for by positing that the string \( be+Af_{1SgP}+n’t+\theta \) found in (70a) can be spelled out as aren’t – but not the string \( be+Af_{1SgP}+n’t \) in (70b) because this is not interrogative (by virtue of having no null interrogative affix attached to it).

Finally, let’s turn to consider the clause \( He \text{ DID win it} \) in (62f), where capitals mark contrastive stress (and the utterance is used to deny any suggestion that he didn’t win the race). One way of handling the relevant phenomenon is to suppose that such sentences contain an invisible positive counterpart of the NegP constituent which appears in negative sentences. Since positive and negative are two different polarities, we can conflate the two types of (positive and negative) projection into a PolP (Polarity Phrase) projection. This is not quite as implausible as it may seem, since some American varieties of English (though not my own British one) allow so to be used to mark positive polarity in a sentence such as \( He \text{ did so win it} \) (meaning ‘He really did win it’). We could then say that an emphatic sentence such as \( He \text{ did (so) win it} \) has the structure shown below:

\[
(71) \quad [CP [C \theta] [TP he [T A]] [\text{PolP (so)} [\text{Pol \theta}] [VP \{v \text{ win} \text{ it}\}]]]
\]

The affix in T in (71) will have no verbal host immediately beneath it to attach to, because the head immediately beneath T is Pol, and Pol does not contain an overt verbal stem (but rather is a null, non-verbal head). Because the affix in (71) is stranded without a verbal host, it is spelled out as an appropriate form of DO – here, did. (For a range of alternative accounts of DO-support, see Halle and Marantz 1993, Lasnik 1995, Embick and Noyer 2001, and Bobaljik 2002)

Our claim that operations like Affix Hopping is intrinsically morphological in nature raises the question of whether head movement (which we have hitherto treated as a syntactic operation) should instead be considered to be a morphological operation which likewise takes place in the PF component – a possibility explored by Chomsky (1999, pp.30-31). There is some reason for thinking that this might be so. For one thing, syntactic movement operations (like those to be discussed in the next two chapters) generally affect maximal projections and not heads, whereas conversely morphological operations generally affect heads and not maximal projections: since head movement is an operation affecting heads, from this perspective it has more in common with morphological operations rather than syntactic
operations. Moreover, if (as assumed here) head movement involves a form of affixation operation by which (e.g.) a preposed T-auxiliary in a main-clause question attaches to a strong interrogative affix in C, it seems to serve essentially the same function (of ensuring that an affix is attached to the right kind of host) as purely morphological operations like Affix Hopping. Indeed, if head movement were treated as a morphological operation taking place in the PF component, we could conflate it with the Affix Attachment operation in (61), by supposing that a tense affix triggers raising of an appropriate host if it is strong enough to do so, but otherwise is lowered onto the relevant host wherever possible, or is spelled out as an appropriate form of DO if stranded. In short, the question of whether head movement is a syntactic operation (as argued by Baltin 2002 and Roberts 2002), or a PF operation (as argued by Chomsky 1999, and by Boeckx and Stjepanović 2001), or has facets of both (as argued by Zwart 2001) is one which remains open at present. In the remainder of this book, we will implicitly take head movement to be a syntactic operation – though there is nothing in our exposition which would be incompatible with assuming it to be a morphological operation which takes place in the PF component (given certain theoretical assumptions).

4.9 Head-movement in nominals

Our discussion so far has focussed entirely on head-movement in clauses. To end this chapter, we look briefly at head-movement in nominals – more particularly, at N-movement (i.e. the movement of a noun out of the head N position of NP into a higher head position within the nominal expression containing it). In this connection, consider the syntax of the English nominal (72a) below and its Italian counterpart (72b) (from Cinque 1994, p.86):

(72)(a) the Italian invasion of Albania
(b) l’invasione italiana dell’Albania

If the adjective Italian is the specifier of the noun invasion, (72a) will have the simplified structure:

(73)

On this view, the noun invasion merges with its PP complement of Albania to form the N-bar (intermediate nominal projection) invasion of Albania, and this in turn merges with the adjectival specifier Italian to form the NP (maximal nominal projection) Italian invasion of Albania; the resulting NP is then merged with the determiner the to form the DP the Italian invasion of Albania. The adjective Italian in (73) can be thought of as being (in an informal sense) the ‘subject’ of invasion, since it identifies the people who are doing the invading – and if subjects are typically specifiers, it is appropriate to analyse the kind of adjective found in (73) as the specifier of the N invasion, of the N-bar invasion of Albania and of the NP Italian invasion of Albania.

In the corresponding Italian structure (72b) l’invasione italiana dell’Albania, the head noun invasione ends up occupying a position to the left of the adjective italiana. Cinque (1994) argues that this is the result of the noun moving out of the head N position of NP into some higher head position within the nominal (via Head Movement). At first sight, it might seem as if the noun attaches to the right of the head D constituent of DP: but – argues Cinque – any such assumption is falsified by nominals like (74) below:

(74) la grande invasione italiana dell’Albania

The fact that the noun invasione ends up positioned after the adjective grande ‘great’ in (74) suggests that the noun cannot move to some position immediately to the right of the determiner la ‘the’. Instead, the noun must ‘move to a head intermediate between N and D’ (Cinque 1994, p.87). If this intervening head is the locus of the number properties of nominals (as suggested by Piccallo 1991 and Ritter 1991), we can
label this intermediate head **Num** (= **Number**). If the adjective *grande* ‘great’ serves as the specifier of Num, this will mean that the derivation of (74) involves the movement operation shown in (75) below:

![Diagram of (75)](attachment:image)

The noun *invasione* originates in the head N position of NP and then (via head movement) moves into the head Num position of NumP, with the original occurrence of *invasione* in N being deleted. It may be that Num is a strong head in Italian (perhaps a strong affix with an N-feature triggering movement of N to Num) by virtue of the richness of the number morphology carried by nouns and adjectives in Italian, whereas Num is a weak head in present-day English by virtue of the impoverished nature of number morphology in English (e.g. adjectives no longer inflect for number). It should also be noted that an assumption embodied in the analysis in (75) is that adjectives serve as specifiers of the expressions they modify, and that different types of adjective serve as specifiers to different types of head (e.g. *italiana* in (75) is the specifier of N, and *grande* is the specifier of Num – or perhaps of an abstract functional head positioned above Num but below D): see Cinque (1994) for a more extensive implementation of the idea that different kinds of adjectives serve as the specifiers of different kinds of heads, and Cinque (1999) for an extension of the specifier analysis to clausal adverbs.

While the kind of N-movement operation found in Italian is not found in present-day English, it did occur in earlier varieties of English. For example, in Chaucer’s *Troilus and Criseyde* we find nominals such as those in (76) below where the italicised noun precedes the bold-printed adjective:

(76)(a) hire own brother *dere* (= her own brother dear)  
(b) a thing *immortal* (= a thing immortal)  
(c) blossomy bowes *grene* (= blossomy branches green)  
(d) hire *hornes pale* (= her horns pale)

The italicised noun in such structures has moved from the head N position of NP into the head Num position of NumP, so moving in front of the bold-printed adjective. (See Kishimoto 2000 for arguments that present-day structures like *something nice* are a last vestige of this once-productive N-to-Num movement operation, deriving from *something nice thing* via movement of *thing* from N to Num.)

Although nouns generally move only as far as Num in Italian, in some other languages nouns can move above Num into the head D position of DP (if the head D of DP is strong/affixal in nature). Consider in this regard the following Norwegian examples (from Taraldsen 1990):

(77)(a) hans bøker om syntaks  
(b) bøkene hans om syntaks  
his books about syntax  
books+the his about syntax

Taraldsen argues that (77b) is derived via movement of the noun *bøker* ‘books’ from the head N position of NP to the head D position of DP, where it attaches to the left of the affixal determiner +ne ‘the’.

Longobardi (1994, p.623) argues that proper nouns (i.e. names) in Italian can raise from N to D across an intervening adjective (like the possessive adjective *mio*) in structures like (78b) below:

(78)(a) *Il mio Gianni* ha finalmente telefonato  
(b) *Gianni mio* ha finalmente telefonato  
The my Gianni has finally phoned  
Gianni mine has finally phoned  
‘My Gianni has finally phoned’  
‘My Gianni has finally phoned’  

In (78a) the head D position of DP is filled by the determiner il ‘the’, and there is no movement of the proper noun *Gianni* from N to D. However, in (78b) the head D position of DP is filled by a null affixal
determiner, and the proper noun Gianni raises from N to D to attach to the null affixal determiner, in the process crossing the possesive adjective mio. In earlier varieties of English, a similar type of movement operation seems to be found in vocative expressions used to address someone, as the italicised vocative in (79b) below illustrates (from Chaucer’s Troilus and Criseyde):

(79a) ‘Iwis, myn uncle,’ quod she  
(b) ‘And whi so, uncle myn? whi so?’ quod she
‘Certainly, my uncle,’ said she  
‘And why so, uncle mine, why so?’ said she

As these examples show, the noun uncle can be positioned either before or after the possessive myn in vocative expressions. How can we account for this? One possibility (suggested in relation to Italian vocatives like mio caro Gianni ‘my dear Gianni’ and Gianni mio caro ‘Gianni my dear’ by Longobardi 1994, p.626) is that vocative structures like uncle myn are DPs in which the noun uncle has raised from N to D, whereas structures like myn uncle are ‘smaller’ nominals which lack a DP projection and hence cannot trigger N-to-D movement. (See Longobardi 1994, 1996, 2001 for an insightful discussion of the syntax and semantics of N-to-D movement in nominals. See also Vikner 1995 and Roberts 2001b for more general discussion of head movement.)

The general conclusion to be drawn from this section is that we find evidence from languages other than present-day English (and from earlier varieties of English) that head movement may apply in nominal as well as clausal structures. In particular, we find evidence of two types of N-movement operation: (i) movement of a noun to a Num position intermediate between D and N; and (ii) movement of a noun to the head D position of DP (with the noun first moving to Num before moving to D, in order for movement of the noun to be successive-cyclic and thereby satisfy the Head Movement Constraint).

4.10 Summary

In this chapter, we have been concerned with the syntax of head movement. We began by looking at auxiliary inversion in questions in English in §4.2, arguing that this involves a T-to-C movement operation whereby an auxiliary moves from the head T position of TP into the head C position of CP. We suggested that auxiliaries move to C in main clause questions because C in such structures is strong (perhaps by virtue of containing a strong affix with a tense feature requiring it to attach to a T constituent) and so attracts an auxiliary in T to move to C. In §4.3 we argued that movement operations like auxiliary inversion involve two separate copying and deletion operations: a copy of the auxiliary in T is merged with a null interrogative affix in C, and then the original occurrence of the auxiliary in T is deleted. In §4.4 we saw that finite main verbs in Elizabethan English could move from V to T by an operation of V-to-T movement (as is shown by word-order in negative sentences like I care not for her), but that this kind of movement is no longer possible in present-day English. We suggested that a null finite T was strong in Elizabethan English (perhaps containing a strong tense affix with a V-feature triggering the raising of verbs to T) but that its counterpart in present-day English is weak (so that a tense affix in T is lowered onto the main verb by the morphological operation of Affix Hopping). In §4.5 we argued that T-to-C movement and V-to-T movement are two different reflexes of a more general Head Movement operation, and that head movement is subject to a strict locality condition (imposed by the Head Movement Constraint) which requires it to apply in a successive cyclic (stepwise) fashion, so that head movement is only possible between a given head and the next highest head within the structure containing it. In §4.6 we argued that present-day English has a last vestige of V-to-T raising in finite clauses whereby BE and HAVE raise from a lower position into the head T position of TP. We suggested that a finite T in present-day English contains a tense affix which is only strong enough to attract an auxiliary-like light verb to move to T, not a lexical verb: we noted that one implementation of this idea would be that a finite T in present-day English can either be filled by a strong affix which requires an auxiliary as its host (and so triggers movement of the auxiliary to T), or by a weak affix which requires a main verb as its host (with the affix being lowered onto V in the PF component). In §4.7, we took another look at negation. Revising our earlier analysis of not as a VP-specifier, we outlined an alternative analysis under which not is the specifier of a NEGP constituent which was headed by ne in Chaucerian English, but which is null in present-day English. On this view, Shakespearean negatives like He heard not that involve movement of the verb from V through NEG into T. Because NEG and T don’t contain a strong enough affix in present-day English, they can no longer trigger movement of a lexical verb. In §4.8 we outlined a morphological account of Affix Hopping and Do-Support. We suggested that once the syntactic component of the
grammar has generated a given syntactic structure (e.g. a complete CP), the relevant structure is then sent to the PF component for morphological and phonological processing. If a structure being processed by the PF component contains an unattached weak tense affix, this is lowered onto the head immediately below by Affix Hopping if this is an overt verb; if not, the affix is spelled out as an appropriately inflected form of DO. We noted that Chomsky in recent work has argued that head movement may be a morphological operation taking place in the PF component. In §4.9, we presented evidence that head movement can also apply in nominal structures. We argued that nouns in Italian raise to a head Num(ber) position intermediate between D and N in structures like la grande invasione italiana dell’Albania ‘the great Italian invasion of Albania’. We noted that in some languages, nouns can raise still further to attach to D – e.g. in Norwegian nominals such as bøkene hans ‘books.the his’.

WORKBOOK SECTION

Exercise 4.1
Discuss the derivation of each of the following (declarative or interrogative) sentences, drawing a tree diagram to represent the structure of each sentence and saying why the relevant structure is (or is not) grammatical (in the case of 4, saying why it is ungrammatical as a main clause):

1. He helps her
2. *He d’s help her
3. *Helps he her?
4. *If he helps her?
5. Does he help her?
6. I wonder if he helps her
7. *I wonder if does he help her
8. *He helps not her
9. *He not helps her
10. *He not helps her
11. He does not help her
12. He doesn’t help her
13. Doesn’t he help her?
14. He might not help her
15. He dare not help her
16. Have you any wool?

(Note that d’s in 2 represents unstressed does, /dəz/.) Say what is unusual about the syntax of 16 below (the second line of the nursery rhyme Baa Baa Black Sheep) – and why such structures have become obsolete in many varieties of English:

17. Is the clock is working?
18. Does it opens?
19. Don’t you don’t want one?
20. Does it doesn’t move?

Consider, also, the derivation of the following questions reported (by Akmajian and Heny 1975, p. 17) to have been produced by an unnamed three-year-old girl:

21. Is I can do that?
22. Is you should eat the apple?
23. Is the apple juice won’t spill?

In addition, comment on the syntax of the following negative sentence produced by a boy called Abe at age 2;5.26 (2 years, 5 months, 26 days):

24. I not can find it

and compare 24 with the corresponding adult structure I cannot find it. Finally, say why you think negative imperatives like 25 below (which were grammatical in Elizabethan English) are ungrammatical in present-day English, and why we find 26 instead:

25. *Be not afraid!
26. Don’t be afraid!

Helpful hints
In 13, account for the fact that the sentence is ambiguous between one interpretation paraphraseable as ‘Is it the case that he doesn’t help her’ and another paraphraseable as ‘Isn’t it the case that he helps her?’ In relation to 14, 15 and 24, consider the scope relations between the auxiliary and not, and bear in mind the suggestion made in the main text that finite auxiliaries normally originate in T, but originate in an AUX position below NEG if they fall within the scope of not. In 17-20, consider the possibility that children
sometimes fail to delete the original occurrence of a moved T constituent. In 19 and 20, consider the possibility that attachment of the clitic *n’t to a tense affix in T may either be treated by the child as a syntactic operation, or as a phonological operation which applies after the relevant syntactic structure has been formed. In relation to 25 and 26, consider the possibility that although a T in finite declarative and interrogative clauses in present-day English is strong enough to attract an auxiliary (but not a lexical verb), T in imperatives is too weak to attract either an auxiliary or a main verb.

Model answer for 1
Given the assumptions made in the text, 1 will have the simplified syntactic structure (i) below:

(i)  
```
  CP
    C
      \TP
        \PRN
          \He
            \T
              Af3SgPr
                \V
                  \help
                    \PRN
                      \her
```

The overall clause is a CP headed by a null declarative complementiser φ which has a TP complement headed by a T constituent which carries a present-tense affix which is third person singular by agreement with the subject he, and which needs an overt verb stem to attach to. Since tense affixes are not strong enough to trigger raising of main verbs in present-day English, the verb help cannot be raised to provide a host for the affix in T. After the syntactic structure in (i) has been formed, it is handed over to the PF component, where it is processed in a bottom-up, cyclic fashion. On the T-cycle, The tense affix in T is lowered onto the end of the verb help by Affix Hopping, which specifies that a weak affix in T is lowered onto the head V of a VP complement of T. Affix Hopping results in the form [help+ Af3SgPr], which is ultimately spelled out as helps. The complement pronoun her is assigned accusative case in the syntax by the c-commanding transitive verb help, and the subject pronoun he is assigned nominative case by the c-commanding null intransitive finite complementiser φ.

Exercise 4.2
Discuss the derivation of the following Shakespearean sentences:

1. Thou marvell’st at my words (Macbeth, Macbeth, III.ii)
2. Macbeth doth come (Third Witch, Macbeth, I.iii)
3. He loves not you (Lysander, Midsummer Night’s Dream, III.ii)
4. You do not look on me (Jessica, Merchant of Venice, II.vi)
5. Wilt thou use thy wit? (Claudio, Much Ado About Nothing, V.i)
6. Wrong I mine enemies? (Brutus, Julius Caesar, IV.ii)
7. Knows he not thy voice? (First Lord, All’s Well That Ends Well, IV.i)
8. Didst thou not say he comes? (Baptista, Taming of the Shrew, III.ii)
9. Canst not rule her? (Leontes, Winter’s Tale, II.iii)
10. Hath not a Jew eyes? (Shylock, Merchant of Venice, III.i)
11. Do not you love me? (Benedick, Much Ado About Nothing, V.iv)
12. Buy thou a rope! (Antipholus, Comedy of Errors, IV.i)
13. Fear you not him! (Tranio, Taming of the Shrew, IV.iv)
14. Speak not you to him! (Escalus, Measure for Measure, V.i)
15. Do not you meddle! (Antonio, Much Ado About Nothing, V.i)
16. She not denies it (Leonato, Much Ado About Nothing, IV.i)

Helpful hints
Assume that 9 has a null finite pro subject. Assume also that the sentences in 12-15 are imperative in force, and consider the possibility that V raises to C in imperatives in Elizabethan English (See Han 2001),
perhaps attaching to a strong imperative affix *Imp*. Consider also the possibility that *not* had a dual status and could either function as an independent word (like present-day English *not*) or could serve as an enclitic particle (like present-day English *n’t*) which attached to an immediately adjacent finite T constituent. Finally, say in what way(s) sentence 16 proves problematic in respect of the assumptions made in the main text (and in the model answer below), and see if you can think of possible solutions (e.g. what if the verb raised as far as NEG but not as far as T?). Assume that genitive nominals like *my words* and *thy wit, mine enemies, and thy voice* are DPs, but do not concern yourself with their internal structure. (We will briefly look at genitive nominals in the next chapter.)

Model answer for 1 and 2
Relevant aspects of the derivation of 1 (here presented in simplified form) are as follows. The verb *marvel* merges with its PP complement *at my words* to form the VP *marvel at my words*. This in turn is merged with a T constituent containing a strong present tense affix (\(= Af\)) to form the T-bar \(Af \text{ marvel at my words}\), which is in turn merged with its subject *thou*. The tense affix agrees with *thou* and thus carries the features [second-person, singular-number, present-tense], below abbreviated to \(2SgPr\). Being strong, the tense affix triggers raising of the verb *marvel* to adjoin to the affix in T. The resulting TP is merged with a null intransitive finite C which marks the declarative force of the sentence and which assigns nominative case to *thou*. 1 thus has the syntactic structure shown in simplified form in (i) below, with the dotted arrow indicating movement of the verb *marvel* from V to T:

(i) \[
\begin{array}{c}
\text{CP} \\
\text{C} \\
\emptyset \\
\text{TP} \\
\text{PRN} \\
\text{thou} \\
T' \\
\text{T} \\
\text{VP} \\
\text{V} \\
\text{PP} \\
\text{marvel}+Af_{2SgPr} \\
\text{at my words}
\end{array}
\]

The string \(\text{marvel}+Af_{2SgPr}\) is ultimately spelled out as *marvell’st* in the PF component.

Sentence 2 is derived as follows. The verb *come* merges with a tense affix in T, forming the T-bar \(Af \text{ come}\). This will in turn be merged with its subject *Macbeth*, which is a DP headed by a null determiner, in accordance with the DP hypothesis. Merging the resulting DP with a null declarative complementiser will derive the syntactic structure shown in (ii) below:

(ii) \[
\begin{array}{c}
\text{CP} \\
\text{C} \\
\emptyset \\
\text{TP} \\
\text{DP} \\
\emptyset \\
\text{D} \\
\text{N} \\
\text{T} \\
\text{T'} \\
\text{V} \\
\text{Af} \\
\text{come}
\end{array}
\]

It would seem that the tense affix in T is ultimately spelled out as *doth* (which is a dialectal variant of *does*). What is surprising about this is that the dummy auxiliary DO (in present-day English, at least) is used only to spell out a tense affix which is unable to find a host by any other means. Since finite verbs can raise from V to T in Elizabethan English, what we’d expect to happen (ii) is for the verb *come* to raise to adjoin to the tense affix in T, so forming the substructure \(\text{come}+Af\), which would ultimately be spelled out as *cometh* (a dialectal variant of *comes*). However (although this is indeed one possible outcome), this is clearly not what happens in the case of 2 *Macbeth doth come*. Why not?

Let us suppose that the tense affix in a finite T in a structure like (ii) in Elizabethan English could be either strong or weak, and that Elizabethan English (perhaps because it had V-to-T raising) did not have any T-toV lowering operation like the Affix Lowering operation found in present-day English. Where T is
strong, the tense affix will trigger raising of the main verb from V to T; where it is weak, the verb will remain in situ, and the tense affix will remain unattached, and so will ultimately spelled out as an appropriately inflected form of DO (here, doth). Such an analysis implies that there was considerably more morphosyntactic variation in Shakespearean English than we find in present-day varieties of Standard English – e.g. in respect of a finite tense affix being either strong or weak. Given that Shakespeare's writing contains a mixture of different dialect forms (as we see from the alternation between dialectal variants like comes/cometh and does/doth), this may not be implausible. However, as noted by Tieken-Boon van Ostade (1988), the origin of do is 'one of the great riddles of English linguistic history'.

___________________________________________________ __________________________________
5. Wh-movement

5.1 Overview

In the previous chapter, we looked at the head movement operation by which a head can move into the next highest head position within the structure containing it. In this chapter, we look at a very different kind of movement operation traditionally termed wh-movement, by which a wh-expression like who or what languages moves into the specifier position within CP. We begin by looking at the syntax of wh-questions, and then go on to probe the syntax of two other types of wh-clause, namely exclamative clauses and relative clauses.

5.2 Wh-questions

So far, we have implicitly assumed that CP comprises a head C constituent (which can be filled by a complementiser or a preposed auxiliary) and a TP complement. However, one question which such an analysis begs is what position is occupied by the bold-printed constituent which precedes the italicised auxiliary in root interrogatives (i.e. main-clause questions) such as (1) below:

(1)(a) What languages can you speak?
(b) Which one would you like?
(c) Who was she dating?
(d) Where are you going?

Each of the sentences in (1) contains an italicised inverted auxiliary occupying the head C position of CP, preceded by a bold-printed interrogative wh-expression – i.e. an expression containing an interrogative word beginning with wh-like what/which/who/where/when/why. (Note that how in questions like How are you? How well did he behave? etc. is also treated as a wh-word because it exhibits the same syntactic behaviour as interrogative words beginning with wh-.) Each of the wh-expressions in (1) functions as the complement of the verb at the end of the sentence – as we see from the fact that each of the examples in (1) has a paraphrase like that in (2) below in which the wh-expression occupies complement position after the italicised verb:

(2)(a) You can speak what languages?
(b) You would like which one?
(c) She was dating who?
(d) You are going where?

Structures like (2) are termed wh-in-situ questions, since the bold-printed wh-expression does not get preposed, but rather remains in situ (i.e. ‘in place’) in the canonical position associated with its grammatical function (e.g. what languages in (2a) is the direct object complement of speak, and complements are normally positioned after their verbs, so what languages is positioned after the verb speak). In English, wh-in-situ questions are used primarily as echo questions, to echo and question something previously said by someone else – as we can illustrate in terms of the following dialogue:

(3) SPEAKER A: I just met Lord Lancelot Humpalot
SPEAKER B: You just met who?

Echo questions such as that produced by speaker B in (3) suggest that the wh-expressions in (1) originate as complements of the relevant verbs, and subsequently get moved to the front of the overall clause. But what position do they get moved into, in non-echoic questions like (1)?

The answer is obviously that they are moved into some position preceding the inverted auxiliary. Since inverted auxiliaries occupy the head C position of CP, let’s suppose that preposed wh-expressions are moved into a position preceding the head C of CP. Given that specifiers are positioned before heads, a plausible suggestion to make is that preposed wh-expressions move into the specifier position within CP (= spec-CP). If so, a sentence like (2c) Who was she dating? will involve the arrowed movement operations shown in (4) below (where who has been assigned to the category PRN – though it should be noted that interrogative pronouns like who are pronominal quantifiers and hence Q-pronouns, and so could alternatively be assigned to the category Q):
Two different kinds of movement operation (indicated by the numbered arrows) are involved in (4): the movement arrowed in (1) involves the familiar operation of head movement by which the bold-printed auxiliary was moves from the head T position of TP to the head C position of CP (adjoining to a null affixal interrogative complementiser ø); by contrast (2) involves movement of an italicised wh-expression from a position below C (here, from the complement position within VP) into the specifier position in CP, and this very different kind of movement operation is known as wh-movement. Note that unlike head movement (which, as its name suggests, moves only heads), wh-movement moves maximal projections; for instance, in (1a) What languages can you speak? wh-movement moves the quantifier phrase what languages which is the maximal projection of the interrogative quantifier what? by virtue of being the largest expression headed by the word what; and in (1c) Who was she dating? it moves the interrogative Q-pronoun who (which is a maximal projection by virtue of being the largest expression headed by the word who). Following Cheng (1997), we might suppose that every clause/CP must be typed (i.e. identified as declarative or interrogative etc. in type) in the syntax, and that a clause is typed as interrogative if it contains an interrogative head or specifier: on this view, movement of the interrogative pronoun who to spec-CP serves to type the CP in (4) as interrogative.

Evidence in support of the assumption that preposed wh-expressions move into spec-CP comes from varieties of English in which a preposed wh-expression can precede a complementiser like that. This is true, for example, of interrogative complement clauses in Belfast English like those bracketed below (from Henry 1995, p.107):

(5)(a) I wonder [which dish that they picked]
(b) They didn’t know [which model that we had discussed]

Since the complementiser that occupies the head C position in the bracketed CP, it seems reasonable to suppose that the wh-expressions which dish/which model in front of that occupy the specifier position within CP, and this is what Alison Henry argues (these wh-expressions having the status of quantifier phrases headed by the wh-quantifier which). Even speakers of standard English varieties occasionally produce wh+that structures in spontaneous speech: see the examples recorded from radio and TV programmes reported in Radford (1988, p.500), and see Seppänen and Trotta 2000 and Zwicky 2002 for further discussion of the syntax of wh+that structures.

A point to note in passing is that although the above discussion implicitly assumed that movement and merger are two entirely distinct types of operation, Chomsky (2001) maintains that movement is simply a particular type of merger. He refers to merger operations which involve taking an item out of the lexical array and merging it with some other constituent as external merge, and to movement operations by which an item contained within an existing structure is moved to a new position as internal merge. Accordingly, wh-movement in (4) can be seen as involving an internal merger operation. (By contrast, head movement involves a different type of adjunction operation by which one head is adjoined to another – though whether head movement is a syntactic or morphological operation is a moot point.)
5.3 Wh-movement as copying and deletion

A tacit assumption made in our analysis of wh-movement in (4) is that just as a moved head (e.g. an inverted auxiliary) leaves behind a null copy of itself in the position out of which it moves, so too a moved wh-expression leaves behind a copy at its extraction site (i.e. in the position out of which it is extracted/moved). In earlier work in the 1970s and 1980s, moved constituents were said to leave behind a trace in the positions out of which they move (informally denoted as t), and traces of moved nominal constituents were treated as being like pronouns in certain respects. A moved constituent and its trace(s) were together said to form a (movement) chain, with the highest member of the chain (i.e. the moved constituent) being the head of the movement chain, and the lowest member being the foot of the chain.

Within the framework of Chomsky’s more recent copy theory of movement, a trace is taken to be a full copy (rather than a pronominal copy) of a moved constituent. Informally, however, we shall sometimes refer to the null copies left behind by movement as traces or trace copies in later sections and chapters.

The assumption that moved wh-expressions leave a copy behind can be defended not only on theoretical grounds (in terms of our desire to develop a unified theory of movement in which both minimal and maximal projections leave behind copies when they move), but also on empirical grounds. One such empirical argument comes from the familiar phenomenon of *have*-cliticisation in sentences like:

(6) I have/I’ve been to Rome more often than I have/*I’ve to Paris

Although *have* can cliticise onto *I* in the string *I’ve been to Rome* in (6), cliticisation is not possible in the string *I’ve to Paris*. Why should this be? Let us make the reasonable assumption that *I’ve to Paris* in (6) is an elliptical variant of *I’ve been to Paris*, so that (6) has the fuller structure shown informally in (7) below, with strikethrough indicating that the ellipsed V receives a null spellout in the PF component:

(7) I have been to Rome more often than I have *been* to Paris

The relevant type of cliticisation operation is subject to a constraint which can be characterised informally in the following terms:

(8) Cliticisation is barred when a clitic is followed by a null constituent

(where ‘is followed by’ can be given an order-free formulation in terms of asymmetric c-command, in ways that I leave the technophiles among you to fathom for yourselves). This accounts for the ungrammaticality of the string *I’ve to Paris* in (6), since *have* is immediately followed by a null copy of the verb *been* and so the constraint (8) blocks *have* from cliticising onto *I*.

In the light of the constraint in (8), consider why cliticisation is permitted in (9) below:

(9)(a) They have very little money in their bank account
   (b) They’ve very little money in their bank account

but not in (10):

(10)(a) I wonder [how much money they have in their bank account]
   (b) *I wonder [how much money they’ve in their bank account]

The bracketed clauses in (10) are interrogative complement clauses which show wh-movement of an interrogative expression to the front of the clause (the moved wh-expression being *how much money*, comprising a quantifier *much* with the complement *money* and the specifier *how*). If (as we claim here) wh-movement involves a copying operation, (10b) will have the fuller structure shown in (11) below:

(11) I wonder [how much money they have how little money in their bank account]

That is, the wh-QP *how much money* will originate as the complement of the verb *have*, and a copy of this constituent will then be placed at the front of the overall sentence, with the original occurrence of the QP receiving a null spellout (marked by strikethrough). But the null QP following the clitic *have* will then block *have* from contracting onto *they* in accordance with the cliticisation constraint in (8). Thus, the ungrammaticality of sentences like (10b) provides us with empirical evidence that wh-movement involves a copying operation.

A different kind of evidence in support of the claim that preposed wh-expressions leave behind a null copy when they move comes from a phenomenon which we can call *preposition copying*. In this connection, consider the following Shakespearean wh-structures:
(12a) *In what enormity is Marcius poor in?* (Menenius, *Coriolanus*, II.i)
(b) *To what form but that he is should wit larded with malice and malice forced with wit turn him to?* (Thersites, *Troilus and Cressida*, V.i)
(c) …that fair [for which love groan’d for] (Prologue to Act II, *Romeo and Juliet*)

(12a, b) are interrogative clauses, and the bracketed structure in (12c) is a *relative clause* – so called because it contains a relative wh-pronoun which relating (more specifically, referring back) to the preceding noun expression that fair. In these examples, an italicised prepositional wh-phrase (i.e. a prepositional phrase containing a wh-word like what/which) has been moved to the front of the relevant clause by wh-movement. But a (bold-printed) copy of the preposition also appears at the end of the clause. In case you think that this is a Shakespearean quirk (or – Heaven forbid – a slip of the quill on the part of Will), the examples in (13) below show much the same thing happening in (bracketed) relative clauses in present-day English:

(13a) But if this ever-changing world *in which we live in* makes you give in and cry, say ‘Live and Let Die’ (Sir Paul McCartney, theme song from the James Bond movie *Live and Let Die*)
(b) IKEA only actually has 10 stores *from which to sell from* (Economics reporter, BBC Radio 5)
(c) Israeli soldiers fired an anti-tank missile and hit a police post *in which the Palestinian policeman who was killed had been in* (News reporter, BBC Radio 5)
(d) Tiger Woods *about whom this Masters seems to be all about* is due to tee off shortly (Sports reporter, BBC Radio 5)
(e) The hearing mechanism is a peripheral, passive system *over which we have no control over* (undergraduate exam paper)

How can we account for preposition copying in structures like (12) and (13)?

The *copy theory of movement* enables us to provide a principled answer to this question. Let’s suppose that wh-movement (like head movement) is a composite operation involving two suboperations of copying and deletion: the first stage is for a copy of the moved wh-expression to be moved into spec-CP; the second stage is for the original occurrence of the wh-expression to be deleted. From this perspective, preposition copying arises when the preposition at the original extraction site undergoes copying but not deletion. To see what this means in more concrete terms, consider the syntax of (12a) *In what enormity is Marcius poor in?* This is derived as follows. The wh-quantifier what merges with the noun enormity to derive the quantifier phrase/QP what enormity. This in turn is merged with the preposition in to form the prepositional phrase/PP in what enormity. This PP is then merged with the adjective poor to form the adjectival phrase/AP poor in what enormity. This AP is merged with the copular verb is to form the verb phrase/VP is poor in what enormity. This VP is merged with a finite T constituent which triggers raising of the verb is from V to T; the resulting T-bar constituent is merged with its subject Marcius (which is a DP headed by a null determiner) to form the tense phrase/TP ø Marcius is poor is in what enormity. Merging this with a strong C into which is moves forms the C-bar *Is ø Marcius is poor is in what enormity?* Moving a copy of the PP in what enormity into spec-C in turn derives the structure shown in simplified form in (14) below (with copies of moved constituents shown in italics)

(14)

```
CP
/\PP
In what enormity
   \√C
     /\T'
      /\ VP
       /\ V
        /\ A
         /\ AP
          /\ PP
           poor in what enormity
```

The two italicised copies of the moved copular verb *is* are deleted by operation of **copy deletion**. But consider how copy deletion affects the copy left behind by movement of the PP in *what enormity* to spec-CP. If we suppose that copy-deletion in (12a) deletes the smallest phrase containing the wh-word *what*, it will delete the quantifier phrase *what enormity* rather than the prepositional phrase *in what enormity*, so deriving (12a) *In what enormity is Marcius poor in?* Thus, preposition copying structures like (12) and (13) provide evidence that wh-movement is a composite operation involving wh-copying and wh-deletion.

A related piece of evidence in support of wh-movement involving a copying operation comes from sentences such as those below:

(15)(a) *What hope of finding any survivors* could there be?
(b)   *What hope* could there be of *finding any survivors*?

(16)(a) *What proof that he was implicated* have you found?
(b)   *What proof* have you found that *he was implicated*?

In order to try and understand what’s going on here, let’s take a closer look at the derivation of (15). The expression *what hope of finding any survivors* in (15a) is a QP comprising the quantifier *what* and an NP complement which in turn comprises the noun *hope* and its PP complement of *finding any survivors* (with the polarity item *any* being able to occur because it is c-commanded by the interrogative quantifier *what*: see exercise 2.2). The overall QP *what hope of finding any survivors* is initially merged as the complement of the verb *be*, but ultimately moves to the front of the overall sentence in (15a): this is unproblematic, since it involves wh-movement of the whole QP. But in (15b), it would seem as if only part of this QP (= the string *what hope*) undergoes wh-movement, leaving behind the PP *of finding any survivors*. The problem with this is that the string *what hope* is not a constituent, only a subpart of the overall QP *what hope of finding any survivors*. Given the standard assumption that only complete constituents can undergo movement, we clearly cannot maintain that the non-constituent string *what hope* gets moved on its own. So how can we account for sentences like (15b)? Copy theory provides us with an answer, if we suppose that wh-movement places a copy of the complete QP *what hope of finding survivors* at the front of the overall sentence, so deriving the structure shown in skeletal form in (17) below:

(17) **What hope of finding any survivors** could there be **what hope of finding any survivors**

If we further suppose that the PP *of finding any survivors* is spelled out in its original position (i.e. in the italicised position it occupied before wh-movement applied) but the remaining constituents of the QP (the quantifier *what* and the noun *hope*) are spelled out in the superficial (bold-printed) position in which they end up after wh-movement, (15b) will be spelled out in the manner shown in simplified form below after copy-deletion has applied (with strikethrough indicating constituents which receive a null spellout):

(18) **What hope of finding any survivors** could there be **what hope of finding any survivors**

As should be obvious, such an analysis relies crucially on the assumption that moved constituents leave behind full copies of themselves. It also assumes the possibility of **split spellout** or **discontinuous spellout**, in the sense that (in sentences like (15) and (16) above) a PP or CP which is the complement of a particular type of moved constituent can be spelled out in one position (in the position where it originated), and the remainder of the constituent spelled out in another (in the position where it ends up). More generally, it suggests that (in certain structures) there a choice regarding which part of a movement chain gets deleted (an idea developed in Bobaljik 1995, Brody 1995, Groat and O’Neil 1996, Pesetsky 1997/1998, Richards 1997, Roberts 1997, Runner 1998, Nunes 1999/2001/2004, Cormack and Smith 1999, Boškovic 2001, Polinsky and Potsdam 2006). A further possibility which this opens up is that wh-in-situ structures may involve wh-movement, but with the moved wh-expression being spelled out in its initial position (at the foot of the movement chain) rather than in its final position (at the head of the movement chain): see Pesetsky (2000) and Reintges, LeSourd and Chung (2002) for analyses of this ilk, and Watanabe (2001) for a more general discussion of wh-in-situ structures.

A further piece of evidence in support of the copy account of wh-movement comes from the fact that a **partial copy** of a moved pronoun may sometimes appear at its extraction site – as (19) below illustrates (the % sign indicating that only a certain percentage of speakers accept such sentences):
(19a) *He is someone [who I don’t know anyone [that likes who]]

(19b) %He is someone [who I don’t know anyone [that likes him]]

The sentences in (19) contain two bracketed relative clauses, one modifying someone and the other modifying anyone. The word who here is a relative pronoun which is initially merged as the complement of the verb likes, but undergoes wh-movement and is thereby moved out of the relative clause containing likes to the front of the relative clause containing know. What we’d expect to happen is that the copy of who left behind at the extraction site receives a null spellout: but this leads to ungrammaticality in (19a), for the following reason. To use a colourful metaphor developed by Ross (1967), relative clauses are islands, in the sense that they are structures which are impervious to certain types of grammatical operation. Let’s suppose that islands have the property that a copy of a moved constituent cannot be given a null spellout if the copy is inside an island and its antecedent lies outside the island: this condition prevents the italicised copy of who from receiving a null spellout in (19a), because it is contained within a relative clause island (namely the that-clause) and its bold-printed moved counterpart who lies outside the island. Some speakers resolve this problem by spelling out the copy overtly as him. Still, this raises the question of why they should spell out a copy of who as him rather than as who. Pesetsky (1997, 1998) argues that this is because of a principle which requires copies of moved constituents to be as close to unpronounceable as possible. Where islandhood constraints prevent a completely null spellout, the minimal overt spellout is simply to spell out the person/number/gender/case features of the expression (but not its wh-feature) – hence the use of the third person masculine singular accusative pronoun him in (19b). The pronoun him can be said to be a partial copy of the moved pronoun who, in that him carries the same person, number, gender and case features as who but lacks its wh-feature.

Further evidence that wh-movement leaves behind a copy which is subsequently deleted comes from speech errors involving wh-copying, e.g. in relative clauses such as that bracketed below:

(20) It’s a world record [which many of us thought which wasn’t on the books at all] (Athletics commentator, BBC2 TV)

What’s the nature of the speech error made by the tongue-tied (or brain-drained) BBC reporter in (20)? The answer is that when moving the relative pronoun which from its initial italicised position to its subsequent bold-printed position, our intrepid reporter successfully merges a copy of which in the bold-printed position, but fails to delete the original occurrence of which in the italicised position. Such speech errors provide us with further evidence that wh-movement is a composite operation involving both copying and deletion.

A different kind of argument in support of positing that a moved wh-expression leaves behind a null copy comes from the semantics of wh-questions. Chomsky (1981, p.324) argues that a wh-question like (21a) below has a semantic representation (more precisely, a Logical Form/LF representation) along the lines shown informally in (21b) below, with (21b) being paraphrasable as ‘Of which x (such that x is a person) is it true that she was dating x?’:

(21a) Who was she dating?

(b) Which x (x a person), she was dating x

In the LF representation (21b), the quantifier which functions as an interrogative operator which serves to bind the variable x. Since a grammar must compute a semantic representation for each syntactic structure which it generates/forms, important questions arise about how syntactic representations are to be mapped/converted into semantic representations. One such question is how a syntactic structure like (21a) can be mapped into an LF-representation like (21b) containing an operator binding a variable. If a moved wh-expression leaves behind a copy, (21a) will have the syntactic structure (4) above which is repeated in simplified form (omitting all details not immediately relevant to the discussion at hand) in (22) below (where who is a null trace copy of the preposed wh-word who):

(22) Who was she dating who?

(See (4) above for a fuller representation of the relevant structure.) The LF-representation for (21a) can be derived from the syntactic representation (22) in a straightforward fashion if the copy who in (22) is given an LF interpretation as a variable bound by a wh-quantifier.

The assumption that a wh-copy (i.e. a copy of a moved wh-expression) has the semantic function of a variable which is bound by a wh-quantifier has interesting implications for the syntax of wh-movement. In
chapter 2, we noted that there is a c-command condition on binding to the effect that one constituent X can only bind another constituent Y if X c-commands Y. If we look at how wh-movement works, we find that it always results in a structure in which the moved wh-expression c-commands (by virtue of occurring higher up in the structure than) its copy. For example, in our earlier structure (4) above, the moved wh-pronoun who c-commands its copy who by virtue of the fact that who is contained within (and hence is a constituent of) the C-bar was she was dating who which is the sister of the PRN-node containing the moved wh-pronoun who. It would therefore seem that a core syntactic property of wh-movement (namely the fact that it always moves a wh-expression into a higher position within the structure containing it) follows from a semantic requirement – namely the requirement that a wh-copy (by virtue of its semantic function as a variable) must be bound by a c-commanding wh-expression (which has the semantic function of an operator expression). Given their semantic function as operators, wh-words are sometimes referred to as wh-operators; likewise, wh-expressions are sometimes referred to as operator expressions, and wh-movement as operator movement.

A related semantic argument in support of the copy theory of movement is formulated by Chomsky (1995) in connection with the interpretation of sentences such as:

(23) Joe wonders which picture of himself Jim bought

In (23), the reflexive anaphor himself can refer either to Joe or to Jim. An obvious problem posed by the latter interpretation is that a reflexive has to be c-commanded by a local antecedent (one contained within the same TP, as we saw in §2.7), and yet Jim does not c-command himself in (23). How can we account for the dual interpretation of himself? Chomsky argues that the copy theory of movement provides a principled answer to this question. The QP which picture of himself is initially merged as the complement of the verb bought but is subsequently moved to front of the bought clause, leaving behind a copy in its original position, so deriving the structure shown in skeletal form in (24) below:

(24) [CP [TP Joe wonders [CP which picture of himself [TP Jim bought which picture of himself]]]]

Although the italicised copy of the QP which picture of himself gets deleted in the PF component, Chomsky argues that copies of moved constituents remain visible in the semantic component, and that binding conditions apply to LF representations. If (24) is the LF representation of (23), the possibility of himself referring to Jim can be attributed to the fact that the italicised occurrence of himself is c-commanded by (and contained within the same TP as) Jim at LF. On the other hand, the possibility of himself referring to Joe can be attributed to the fact that the bold-printed occurrence of himself is c-commanded by (and occurs within the same TP as) Joe.

In this section, we have seen that there is a range of empirical evidence which supports the claim that a constituent which undergoes wh-movement leaves behind a copy at its extraction site. This copy is normally given a null spellout in the PF component, though we have seen that copies may sometimes have an overt spellout, or indeed part of a moved phrase may be spelled out in one position, and part in another. We have also seen that copies of moved wh-constituents are visible in the semantic component, and play an important role in relation to the interpretation of anaphors.

5.4 Driving wh-movement and auxiliary inversion

An important question raised by the analysis outlined above is what triggers wh-movement. Chomsky (2005b) suggests that an edge feature is the mechanism which drives movement of wh-expressions to spec-CP. More specifically, he maintains that just as T in finite clauses carries an [\EPP] feature requiring it to be extended into a TP projection containing a specifier on the edge of TP, so too C in questions carries an edge feature [\EF] requiring it to be extended into a CP projection containing a specifier on the edge of CP. These two types of feature differ in that the EPP feature on T works in conjunction with agreement (so that T requires as its subject a constituent which it agrees with in person/number), whereas the edge feature on C operates independently of agreement, allowing C (in principle) to attract any type of constituent to move to the specifier position within CP. However, if we follow Radford et al (1999) in positing that (in languages like English):

(25) A clause is interpreted as a non-echoic question if (and only if) it is a CP with an interrogative specifier (i.e. a specifier containing an interrogative word)
then it follows that the edge feature on an interrogative C will need to attract an interrogative expression to move to spec-C in order for the relevant clause to be interpreted as interrogative via (25).

We can illustrate how the edge feature analysis of wh-movement works by looking at the derivation of the bracketed interrogative complement clause below:

(26) He wants to know [where you are going]

The bracketed wh-question clause in (26) is derived as follows. The verb *going* is merged with its complement *where* to form the VP *going where*. The present-tense T-auxiliary *are* is then merged with the resulting VP to form the T-bar *are going where*. The pronoun *you* is in turn merged with this T-bar to form the TP *you are going where*. A null interrogative complementiser *[C Ø]* is subsequently merged with the resulting TP. Since English (unlike Chinese) is the kind of language which requires wh-movement in non-echoic wh-questions, C also has an edge feature [EF] requiring it to have a specifier (with the specifier having to be interrogative in order for the resulting structure to be interpreted as a question). Accordingly, merging C with its TP complement will form the C-bar in (27) below (with the edge-feature on C being bracketed, following the convention that features are enclosed in square brackets):

(27)

---

The locative adverbial pronoun *where* is categorised here as a PRN/pronoun, though – like other adverbial wh-pronouns such as *how* and *when* – could equally be categorised as an ADV/adverb.) The edge feature on C enables it to attract the wh-pronoun *where* to move from its VP-complement position in (27) to CP-specifier position. ‘If EF is always deleted when satisfied’ (Chomsky 2006, p.8), the edge feature carried by C will be deleted (and thereby inactivated) once its requirements are satisfied (deletion being indicated by strikethrough), so that (arrowed) wh-movement derives the structure (28) below:

(28)

---

There is no auxiliary inversion (hence no movement of the auxiliary *are* from T to C) because (28) is a complement clause, and an interrogative C does not carry a tense feature triggering auxiliary inversion in complement clauses.

By contrast, main-clause wh-questions involve auxiliary inversion as well as wh-movement, as we see from sentences like (29) below:

(29) Who were you phoning?
Let’s suppose that the derivation of (29) proceeds as follows. The wh-pronoun who merges with the verb *phoning* to form the VP *phoning who*. The resulting VP is subsequently merged with the past tense auxiliary *were* to form the T-bar *were phoning who*, which is itself merged with the pronoun *you* to form the TP *you were phoning who*. This TP is then merged with a null interrogative C which carries an edge feature. Since (29) is also a main-clause question, C will additionally carry a tense feature [TNS]. Given these assumptions, merging C with the TP *you were phoning who* will derive the following structure:

\[(30)\]

The tense feature on C attracts the present-tense auxiliary *were* to move to C (attaching to a null affixal interrogative complementiser). The edge feature on the interrogative C triggers movement of the interrogative pronoun *who* to spec-CP, so deriving the structure shown below (with the tense and edge features on C being deleted once their requirements are met, and arrows indicating movements which take place in the course of the derivation):

\[(31)\]

And (31) is the superficial syntactic structure of (28) *Who were you phoning?*

A key assumption embodied in the analysis of wh-questions outlined here is that made in (25) above, repeated as (32) below:

\[(32)\] A clause is interpreted as a non-echoic question if (and only if) it is a CP with an interrogative specifier (i.e. a specifier containing an interrogative word)

This assumption has interesting implications for the syntax of yes-no questions such as:

\[(33)\] Is it raining?

It implies that not only (non-echoic) wh-questions but also (non-echoic) yes-no questions are CPs with an interrogative specifier. But what kind of specifier could yes-no questions contain? The answer suggested in Katz and Postal (1964), Bresnan (1970), Grimshaw (1993) and Roberts (1993) is that they contain a null question operator which is directly generated in spec-C (i.e. which is positioned in spec-C by simple merger rather than movement). From a historical perspective, the null operator analysis is by no means
implausible, since Elizabethan English had main-clause yes-no questions introduced by the overt question word \textit{whether}, as illustrated below:

(34)(a) Whether had you rather lead mine eyes or eye your master’s heels? (Mrs Page, \textit{Merry Wives of Windsor}, III.ii)  
(b) Whether dost thou profess thyself a knave or a fool? (Lafeu, \textit{All’s Well That Ends Well}, IV.\textit{v})

Given the null operator analysis of yes-no questions, we can posit that yes-no questions have essentially the same syntax in present-day English as in Elizabethan English, save that yes-no questions could be introduced by the overt interrogative operator \textit{whether} in Elizabethan English, but are introduced by a null interrogative operator (a null counterpart of \textit{whether}, according to Bresnan 1970) in present-day English.

A second piece of evidence in support of the null operator analysis comes from the fact that yes-no questions can be introduced by \textit{whether} when they are transposed into reported speech (and so occur in a complement clause), as we see from the examples below:

(35)(a) ‘Are you feeling better?’ he asked  
(b) He asked whether I was feeling better

A third piece of evidence is that yes-no questions with auxiliary inversion resemble \textit{whether} questions in that in both cases yes/no are appropriate answers: cf.

(36)(a) When he asked ‘Did you vote for Larry Loudmouth?’, I said ‘Yes’ and you said ‘No’  
(b) When he asked whether we voted for Larry Loudmouth, I said ‘Yes’ and you said ‘No’

A fourth argument is that main-clause yes-no questions can be tagged by \textit{or not} in precisely the same way as complement-clause \textit{whether} questions: cf.

(37)(a) Has he finished \textit{or not}?  
(b) I can’t say whether he has finished \textit{or not}

If yes-no questions are CPs containing a null counterpart of \textit{whether} in spec-C, we can arrive at a unitary characterisation of (non-echoic) questions as \textit{CPs with an interrogative specifier}.

What all of this means is that (33) \textit{Is it raining?} will be derived as follows. The present tense auxiliary \textit{is} merges with the verb \textit{raining} to form the T-bar \textit{is raining}. The resulting T-bar merges with the subject \textit{it} to form the TP \textit{it is raining}. This TP in turn merges with a null C which has a tense feature and an edge feature. The tense feature of C attracts (a copy of) the T constituent \textit{is} to merge with C; the requirement imposed by the edge feature of the interrogative C for CP to have an interrogative specifier is met by merging a null yes-no question operator in spec-C (which, for concreteness, we can take to be a null counterpart of the adverb \textit{whether}, below symbolised as \textit{whether}), ultimately deriving the structure shown below (after deletion of the features of C and of the original occurrence of \textit{is}):

(38)

If we take the yes-no question operator to be a null counterpart of \textit{whether}, the lexical entry for \textit{whether} will need to specify that it receives a null spellout in main clauses but is spelled out as \textit{weðə}\$\text{\text} elsewhere.

5.5 Pied-piping

The wh-questions we have analysed so far have all involved movement of a wh-word to spec-CP. However, sometimes it’s more than just a wh-word which gets preposed under wh-movement. For example, if we look at the wh-movement counterpart of a wh-in-situ question like (22a) below, we find that when the wh-quantifier \textit{which} is moved to the front of the sentence, the noun \textit{assignment} has to be moved together with it:
To use the relevant technical term, when a wh-quantifier is moved to spec-C, its complement has to be pied-piped (i.e. dragged) along with it, so that the whole quantifier phrase which assignment moves to spec-C – as in (39c). (The colourful pied-piping metaphor was coined by Ross 1967, based on a traditional fairy story in which the pied-piper in the village of Hamelin enticed a group of children to follow him out of a rat-infested village by playing his pipe.) Why should this be? In order to try and answer this question, let’s consider how (39c) is derived.

The quantifier which merges with the noun assignment to form the QP which assignment. This in turn is merged with the verb done to form the VP done which assignment. The resulting VP is subsequently merged with the present tense auxiliary have to form the T-bar have done which assignment, which is itself merged with the pronoun you to form the TP you have done which assignment. TP is then merged with a null interrogative C. Since (39c) is a main-clause question, C will carry tense and edge features. Consequently, merging C with the TP you have done which assignment will derive the following structure:

(40)

The tense feature of C attracts the present-tense auxiliary have to move to C, attaching to a null affix in C. The edge feature of C attracts an interrogative expression to move to the specifier position on the edge of CP.

However, a question which arises at this point is why C can’t simply attract the wh-word which on its own to move to spec-C, so deriving the structure (41) below (with arrows marking wh-movement and auxiliary inversion):

(41)

The resulting derivation crashes, as we see from the ungrammaticality of (39b) *Which have you done assignment? Why should this be?
Chomsky (1995, p.253) suggests that movement of *which* on its own violates the following UG condition on movement chains (the bracketed material being added by me, for clarity):

(42) **Chain Uniformity Condition**

‘A chain is [only well-formed if every copy in it is] uniform with regard to phrase structure status’

The condition (42) rules out the possibility of *which* moving on its own in (40) for the following reason. In (41), the moved wh-word *which* in spec-C has the status of a maximal projection by virtue of being the largest expression headed by the word *which*; by contrast, the null copy *which* left behind by wh-movement has the status of a minimal projection by virtue of being the head Q constituent of the QP *which assignment*. The resulting wh-chain thus violates the Chain Uniformity Condition (42) by having a maximal projection at its head and a minimal projection at its foot.

However, while we have now accounted for why the quantifier *which* cannot move on its own in (39b), we have not accounted for how the whole quantifier phrase *which assignment* comes to move in (39c) *Which assignment have you done?* Why should this be? The answer lies in a further condition which Chomsky (1989, p.69) formulates as follows:

(43) **Economy Condition**

‘Derivations and representations...are required to be minimal, with no superfluous steps in derivations and no superfluous symbols in representations’

What this implies in relation to movement operations is that we move the smallest constituent possible, and (if this is prevented by some constraint) move the next smallest possible constituent (...and so on). Now, the edge feature on the interrogative C in (40) means that C attracts an interrogative constituent. The Economy Condition (43) means that C attracts the *smallest possible* interrogative constituent to move to spec-C. The smallest syntactic constituent is a head, so the Economy Condition (43) tells us that what we should do first is try and move the head interrogative Q *which* of the QP *which assignment* to spec-C. However (as we have just seen), movement of the wh-word *which* on its own is blocked by the Chain Uniformity Condition (42). Hence, in conformity with the Economy Condition, we try moving the next smallest constituent containing the interrogative word *which*, and this is the QP *which assignment*.

Movement of the whole QP to spec-C derives the structure shown below:

(44) CP
    QP
    Which assignment
    C
    C'
    TP
    [TNS, EF]
    have+ø
    PRN
    you
    T'
    T
    have
    VP
    done
    QP

The resulting structure is convergent (as we see from the grammaticality of (39c) *Which assignment have you done?*) and is interpreted as a non-echoic question (in accordance with 25/32 above) by virtue of being a CP with an interrogative specifier.

Our discussion here shows that (in consequence of the Economy Condition), when movement of a wh-word on its own is not possible, a phrase containing the wh-word is moved instead. But note, however, that we can’t just move *any* phrase containing a wh-word. For example, although the verb phrase *have done which assignment* in (40) is a phrase containing the wh-word *which*, it cannot undergo wh-movement – as we see from the ungrammaticality of:

(45) *Done which assignment have you?*

Why should this be? The answer is that the Economy Condition tells us that (when movement of a
wh-word on its own is barred by some constraint), we move the \textit{smallest possible} phrase containing the wh-word. And if you look at the structure in (40), you will see that the smallest phrase containing \textit{which} is the QP \textit{which assignment} and not the VP \textit{done which assignment}. Accordingly, the wh-quantifier \textit{which} pied-pipes the noun \textit{assignment} along with it when it moves, but not the verb \textit{done}.

The conclusion which emerges from our discussion in this section is the following. An interrogative C carries an edge feature enabling C to attract an interrogative word. Where the relevant wh-word is the head of a larger phrase, the Chain Uniformity Condition will prevent movement of the wh-word on its own, and the Economy Condition will require movement of the smallest phrase containing the wh-word. If we further suppose (following Chomsky 1995) that only heads and maximal projections can undergo grammatical operations, these conditions (taken together with the interpretive condition 25/32) mean that:

(46) An interrogative C attracts the smallest possible maximal projection containing an interrogative word to become its specifier

An interesting question raised by the \textit{economy} analysis sketched above is how we account for what happens in clauses like those bracketed in (47) below where an (italicised) interrogative expression is the complement of a (bold-printed) preposition:

(47)(a) They asked [\textit{who} he was referring to] (b) They asked [\textit{to whom} he was referring]

In these examples, the interrogative pronoun \textit{who}/\textit{whom} is the complement of the preposition \textit{to} (the accusative form of the pronoun being spelled out as \textit{whom} in formal styles and as \textit{who} in other styles). In informal styles, the pronoun \textit{who} is preposed on its own, leaving the preposition \textit{to} \textit{stranded} or \textit{orphaned} at the end of the bracketed complement clause – as in (47a). However, in formal styles, the preposition \textit{to} is \textit{pied-piped} along with the pronoun \textit{whom}, so that the whole PP \textit{to whom} moves to spec-C position within the bracketed clause – as in (47b). Let’s take a closer look at what’s going on here.

Given the assumptions made here, the bracketed interrogative complement clause in (47a) will be derived as follows. The preposition \textit{to} merges with its interrogative pronoun complement \textit{who} to form the PP \textit{to who}. This in turn is merged with the verb \textit{referring} to form the VP \textit{referring to who}. This VP is then merged with the past tense auxiliary \textit{was}, forming the T-bar \textit{was referring to who}, and this in turn is merged with the subject pronoun \textit{he} to form the TP \textit{he was referring to who}. Merging the resulting TP with a null interrogative complementiser carrying an edge feature [\textit{EF}] will derive the structure below:

(48)

\begin{verbatim}
C C'
  | [EF] PRN T
  |  PRN T' 
  |    TP
  |     T
  |      V
  |       PP
  |        P
  |         PRN
  |          who

Was referring to whom

Given the Economy Condition (43), we’d expect the edge feature of C to trigger movement of the smallest maximal projection containing an interrogative word to the specifier position within CP. Since the pronoun \textit{who} is a maximal projection containing an interrogative word (by virtue of being the largest expression headed by the interrogative word \textit{who}) it follows that \textit{who} can move to spec-C (thereby deleting the edge feature of C), so deriving the CP shown in simplified form below:
And (49) is the structure of the bracketed interrogative complement clause in (47a).

But what about the derivation of the bracketed complement clause in the formal-style sentence (47b) They asked [to whom he was referring]? Why should the whole prepositional phrase to whom be moved to the front of the complement clause in (47b), with the preposition to being pied-piped along with the interrogative pronoun whom? The answer suggested by Chomsky (1995, p.264) is that in formal styles of English, there is a Stranding Constraint which ‘bars preposition stranding’. This constraint means that (in formal styles) the interrogative pronoun whom cannot be preposed on its own, since this would leave the preposition to stranded and thus lead to violation of the Stranding Constraint. So, in accordance with the Economy Condition (43), the next smallest maximal projection containing the interrogative word is preposed instead, namely the PP to whom, resulting in the structure shown in highly simplified form below:

(50) CP
PP to whom C he was referring to whom ∅

And (50) is the structure of the bracketed clause in (47b) They asked [to whom he was referring].

A further instance of pied-piping is found in possessive structures such as the following:

(51)(a) You have borrowed whose car?
(b) *Whose have you borrowed car?
(c) Whose car have you borrowed?

In the echo-question (51a), the interrogative phrase whose car remains in situ in complement position within the verb phrase. In the corresponding non-echo questions in (51b, c) the genitive pronoun whose undergoes wh-movement on its own in (51b) but leads to an ungrammatical outcome, whereas the larger expression whose car undergoes wh-movement in (51c) and results in a grammatical sentence. So, it would seem that movement of whose to the front of the overall sentence requires the noun car to be pied-piped along with whose. Why should this be?

In order to answer this question, we need to understand the structure of the wh-expression whose car. At first sight, it might seem as if whose is the head of the phrase whose car. However, closer reflection suggests that this cannot be so because whose carries genitive case and yet whose car is the complement of the transitive verb borrow in (51) and so must be accusative. Moreover, whose in (51) can be substituted by a phrasal genitive (as in ‘Which of the men’s car did you borrow?’); and since phrases can occupy the specifier (but not the head) position within a projection, it seems more likely that genitives are the specifiers of the expressions containing them. Furthermore, whose car is definite in interpretation (in the sense that it has a meaning paraphrasable as ‘the car belonging to who?’), suggesting that it must be a DP headed by a definite determiner (and indeed there are a number of languages which have a type of possessive structure paraphrasable in English as whose the car – e.g. Hungarian). Since there is no overt determiner in a structure like whose car, we can follow Abney (1987) in assuming that its head must be a null counterpart of the definite D constituent the.

Given these assumptions, (51c) Whose car have you borrowed? will be derived as follows. The noun car is merged with a null determiner which is definite in interpretation, and which marks possession: this forms the D-bar ϕ car. This in turn is merged with its pronoun specifier whose forming the DP whose ϕ car. This DP is merged with the verb borrowed, forming the VP borrowed whose ϕ car. The resulting VP is merged with the present tense T-auxiliary have, forming the T-bar have borrowed whose ϕ car, which in
turn is merged with its subject you forming the TP you have borrowed whose φ car. This TP is then merged with an interrogative C carrying tense and edge features, so forming the C-bar in (52) below:

(52)

```
C'                     C
    |                   |
    |                   |
    TP                  TP
    |                   |
    |                   |
    PRN                 PRN
    |                   |
    |                   |
    φ                   φ
    you                 have
    T                   V
    |                   |
    |                   |
    |                   |
    |                   |
    have               borrowed
    |                   |
    |                   |
    |                   |
    |                   |
    have               borrowed
    |                   |
    |                   |
    |                   |
    |                   |
    have               borrowed
    |                   |
    |                   |
    |                   |
    |                   |
    have               borrowed
```

The tense feature of C triggers movement of the present-tense auxiliary have from T to C, and the edge feature of C attracts the smallest possible maximal projection containing an interrogative word to move to spec-CP. Now, the smallest maximal projection containing an interrogative word in (52) is the genitive pronoun whose itself, which is a maximal projection by virtue of being the largest expression headed by whose. Hence, we might expect whose to move to spec-C on its own, so deriving the structure associated with (51b) *Whose have you borrowed car? But the resulting sentence is ungrammatical. Why?

The answer lies in a constraint identified by Ross (1967) which we can formulate loosely as follows:

(53) **Left Branch Condition/LBC**

In languages like English, the leftmost constituent of a nominal, adjectival, or adverbal expression cannot be extracted out of the expression containing it

(Nominal expressions can be taken to include DP and QP. In an order-free model of syntax like that assumed in Minimalism where word-order is determined by PF linearisation conditions, LBC will have to be formulated in structural terms, e.g. as barring extraction of any constituent from the edge of the relevant kinds of expression: see Davies and Dubinsky 2003 and Bošković 2004 for attempts to develop a Minimalist account of LBC.) If we look at (52), we see that the genitive pronoun whose is the leftmost constituent of the DP whose φ car. Consequently, the Left Branch Condition (53) prevents whose from being extracted out of the DP containing it, so accounting for the ungrammaticality of (51b) *Whose have you borrowed car? In accordance with the Economy Principle (43), we therefore try preposing the next smallest maximal projection containing whose, namely the DP whose φ car. Moving this DP to spec-C has the effect of pied-piping the noun car along with the interrogative word whose, and derives the structure shown in (54) below (simplified by showing only overt constituents and not showing the internal structure of TP or DP):

(54)

```
DP                       CP
    |                   |
    |                   |
    whose car         whose car
    |                   |
    C                   C'
    |                   |
    |                   |
    [TNS, EF]          [TNS, EF]
    have               have
    you borrowed       you borrowed
```

This leads to a convergent derivation, as we see from the grammaticality of (51c) Whose car have you borrowed?
5.6 Long-distance wh-movement

The account of (non-echoic) wh-questions which we have presented so far amounts to claiming that the smallest possible maximal projection containing an interrogative word moves to the specifier position in the CP containing it. But this assumption raises interesting questions about what happens in complex questions – that is, in questions where an interrogative word originates in a lower clause and moves to the front of a higher clause. In this connection, consider a complex sentence such as the following:

(55) He might think that she is hiding something

If we replace the pronoun *something* by its interrogative counterpart *what*, we form the echo question in (56) below:

(56) He might think that she is hiding *what*?

However, if we want to form the corresponding non-echoic question, the wh-word *what* has to be moved from the sentence-final position it occupies in (56) above into the sentence-initial position which it occupies in (57) below:

(57) *What* might he think that she is hiding?

Such structures (in which a wh-expression in a lower clause moves to the front of a higher clause) are said to involve long-distance wh-movement. In this section, we look at how long-distance wh-movement works.

In chapter 1, we posited that UG incorporates a Locality Principle to the effect that all grammatical operations are local (so that e.g. an auxiliary agrees with the subject of its own clause, not with the subject of some other clause). Chomsky (1973) proposed a particular locality condition on movement operations which we can outline in simplified form as follows:

(58) **Subjacency Condition**

No constituent can move across more than one bounding node at a time (bounding nodes including the constituent formerly known as S, but known in more recent work as TP)

(The relevant principle was termed the Subjacency Condition because it meant e.g. that a constituent could only move into a higher TP from an immediately subjacent TP – i.e. from a TP immediately beneath it. A complication which we set aside here is the claim by Rizzi 1982 that bounding nodes are parameterised, and that S/TP is a bounding node in English, but S-bar/CP is a bounding node in languages like Italian.) The Subjacency Condition has important implications for wh-movement. It entails that in complex questions like (57) which contain more than one clause (and hence more than one TP), wh-movement cannot move the interrogative pronoun *what* directly from the position in which it originates into the position in which it ends up, in the manner shown in skeletal form by the arrow below:

(59) \[ CP \text{ What might } [ TP \text{ he think } [ CP \text{ that } [ TP \text{ she is hiding } \text{what} ]] ] \]

The reason is that any such single-step movement would violate the Subjacency Condition, by virtue of moving *what* across two separate bounding nodes (viz. across the two bold-printed TP nodes) in one go. The only way of avoiding violation of the Subjacency Condition is to suppose that wh-movement applies in two separate steps, moving the wh-pronoun *what* first to the spec-C position in the complement clause (in front of the complementiser *that*), and then into the spec-C position at the front of the main clause – as shown by the two arrows below;

(60) \[ CP \text{ What might } [ TP \text{ he think } [ CP \text{ what that } [ TP \text{ she is hiding } \text{what} ]] ] \]

Since each separate application of wh-movement in (60) crosses only one TP, there is no violation of the Subjacency Condition. On this view, wh-movement is a local (clause-bound) operation which applies in a successive-cyclic fashion, moving a wh-expression first to the front of the clause in which it originates,
then to the front of the next highest clause...and so on until the wh-expression reaches its ultimate landing site at the front of the interrogative clause.

If (as Chomsky suggests) wh-movement is driven by an edge feature on C, and if wh-movement applies in a successive-cyclic (one-clause-at-a-time) fashion, it follows that the head C in each of the clauses through which a wh-expression moves must have an edge feature of its own, enabling it to attract a wh-expression to move to its specifier position. Given this assumption, (57) will be derived as follows. The verb hiding merges with the interrogative pronoun what to form the VP hiding what. This VP is merged with the T-auxiliary is to form the T-bar is hiding what, which is then merged with the pronoun she to form the TP she is hiding what. The resulting TP is merged with the complementiser that to form the C-bar that she is hiding what. The complementiser that has an edge feature which attracts what to move to its specifier position, thereby deriving the following structure (with the edge feature on C being deleted once its requirements have been satisfied, and the original copy of what also being deleted):

\[
(61) \quad \text{CP} \quad \text{PRN} \quad \text{C} \quad \text{TP} \quad \text{PRN} \quad \text{T} \quad \text{VP} \quad \text{PRN} \quad \text{V} \quad \text{PRN} \quad \text{C}
\]

The CP in (61) is then merged as the complement of the verb think, forming the VP think what that she is hiding what. The resulting VP is merged as the complement of the past-tense modal T-auxiliary might, forming the T-bar might think what that she is hiding what. This T-bar is itself merged with the subject pronoun he, forming the TP he might think what that she is hiding what. The TP thereby formed is merged with a null C constituent ø which (in main-clause questions) carries both a tense feature and an edge feature, so forming the C-bar ø he might think what that she is hiding what. The tense feature of the null affixal complementiser attracts the T-auxiliary might to move from T to C, and the edge feature of the complementiser attracts a copy of the interrogative pronoun what to move to become the specifier of C, so deriving the structure shown in simplified form in (62) below (with arrows indicating movements which take place in the course of the derivation):

\[
(62) \quad \text{CP} \quad \text{PRN} \quad \text{C} \quad \text{TP} \quad \text{PRN} \quad \text{T} \quad \text{VP} \quad \text{PRN} \quad \text{V} \quad \text{PRN} \quad \text{C}
\]
On this view, long-distance wh-movement proceeds in a successive-cyclic fashion (i.e. in a succession of short steps, one clause at a time), with each individual step involving a local operation moving a wh-expression to the specifier position in the CP immediately containing it. As should be obvious, each of the two wh-movement operations in (62) satisfies the Subjacency Condition, because each moves the interrogative pronoun what out of only one TP constituent, into the nearest spec-C position above it.

Although we have characterised the locality of movement here in terms of Chomsky’s Subjacency Condition, we could alternatively have characterised it in terms of a rather more general condition proposed by Luigi Rizzi (1990), which can be outlined informally as follows:

(63) Relativized Minimality Condition
A moved constituent moves to the nearest appropriate landing site above it (the landing site for a moved constituent being the position it moves into)

(The constraint is so called because it requires a constituent to move to the minimal/closest landing-site relative to the kind of movement operation involved.) Since spec-C is the landing-site for a moved wh-constituent, the Relativized Minimality Condition requires a moved wh-expression to move into the nearest spec-C condition above it. This condition is met in (62) by virtue of the fact that what moves first into the spec-C position in the lower clause before subsequently moving into the spec-C position in the higher clause. Thus, the Relativised Minimality Condition (like the Subjacency Condition) requires wh-expressions to move in a successive-cyclic fashion, one clause at a time. However, the Relativised Minimality Condition/RMC is more general than the Subjacency Condition/SC in that it determines not only how operations like wh-movement work, but also how operations like Head Movement apply. RMC entails that a head must move to the next highest head position in the structure (e.g. from V to T, or from T to C): thus, RMC subsumes the Head Movement Constraint (whereas SC does not).

The key assumption being made here is that UG principles (such as the Subjacency Condition or the Relativised Minimality Condition) require long-distance wh-movement to take place in a series of short-distance steps. There is a considerable amount of empirical evidence (both from English and from other languages) that wh-movement is indeed a local operation which moves a wh-expression one clause at a time. However, the Relativised Minimality Condition/RMC is more general than the Subjacency Condition/SC in that it determines not only how operations like wh-movement work, but also how operations like Head Movement apply. RMC entails that a head must move to the next highest head position in the structure (e.g. from V to T, or from T to C): thus, RMC subsumes the Head Movement Constraint (whereas SC does not).

An interesting piece of evidence that wh-expressions move one clause at a time comes from the phenomenon of wh-copying in Child English. Ros Thornton (1995) reports children producing long-distance wh-copy questions such as the following (1995, p.147):

(64)(a) What do you think [what Cookie Monster eats]?
(b) How do you think [how Superman fixed the car]?

In such cases, it would appear that the wh-word moves to the italicised spec-C position within the bracketed complement clause before moving into its final landing-site in the bold-printed spec-C position in the main clause. While the children concerned ‘know’ that the original occurrence of the wh-word receives a null spellout, they wrongly assume that any wh-copy in any spec-C position is overtly spelled out (whereas only the highest such copy is overtly spelled out in adult English). Children’s wh-copying structures thus provide evidence that wh-expressions move one clause at a time.

A further piece of evidence leading to the same conclusion comes from the interpretation of reflexive anaphors like himself. As we saw in Exercise 2.2, these are subject to Principle A of Binding Theory which requires an anaphor to be locally bound and hence to have an antecedent within the TP most immediately containing it. This requirement can be illustrated by the contrast below:

(65)(a) *Jim was surprised that [TP Peter wasn’t sure [CP that [TP Mary liked this picture of himself best]]]
(b) Jim was surprised that [TP Peter wasn’t sure [CP which picture of himself [TP Mary liked best]]]

In (65a), the TP most immediately containing the reflexive anaphor himself is the bold-printed TP whose subject is Mary, and since there is no suitable (third person masculine singular) antecedent for himself within this TP, the resulting sentence violates Binding Principle A and so is ill-formed. However, in (65b) the wh-phrase which picture of himself has been moved to the specifier position within the bracketed CP, and the TP most immediately containing the reflexive anaphor is the italicised TP whose subject is Peter. Since this italicised TP does indeed contain a c-commanding antecedent for himself (namely its subject
there is no violation of Principle A if \textit{himself} is construed as bound by \textit{Peter} – though Principle A prevents \textit{Jim} from being the antecedent of \textit{himself}.

In the light of this restriction, consider the following sentence:

(66) \textit{Which picture of himself wasn’t he sure that Mary liked best?}

In (66), the antecedent of \textit{himself} is \textit{he} – and yet \textit{himself} is clearly not c-commanded by \textit{he}, as we see from (67) below (simplified in numerous ways, including by showing only overt constituents):

(67)

\begin{center}
\begin{tikzpicture}
  \node (Q) at (0,0) {\textit{which}};
  \node (NP) at (1,0) {\textit{picture}};
  \node (PP) at (2,0) {\textit{of \textit{himself}}};
  \node (C) at (3,0) {\textit{wasn’t \textit{he}}};
  \node (TP) at (4,0) {\textit{sure that Mary liked best}};
  \node (T') at (5,0) {\textit{}};

  \draw (Q) -- (NP);
  \draw (NP) -- (PP);
  \draw (C) -- (TP);
  \draw (TP) -- (T');
\end{tikzpicture}
\end{center}

In fact, the only elements c-commanded by the pronoun \textit{he} in (67) are T-bar and its constituents. But if \textit{he} does not c-command \textit{himself} in (67), how come \textit{he} is interpreted as the antecedent of \textit{himself} when we would have expected such a structure to violate Principle A of Binding Theory and hence to be ill-formed?

We can provide a principled answer to this question if we suppose that wh-movement operates in a successive-cyclic fashion, and involves an intermediate stage of derivation represented in (68) below (simplified by showing overt constituents only):

(68) \[ [\textit{TP He wasn’t sure [\textit{CP which picture of himself that [\textit{TP Mary liked best}]}]}] \]

In (69), the anaphor \textit{himself} has a c-commanding antecedent within the italicised TP most immediately containing it – namely the pronoun \textit{he}. If we follow Belletti and Rizzi (1988), Uriagereka (1988) and Lebeaux (1991) in supposing that the requirements of Principle A can be satisfied at any stage of derivation, it follows that positing that a sentence like (66) involves an intermediate stage of derivation like (68) enables us to account for why \textit{himself} is construed as bound by \textit{he}. More generally, sentences like (66) provide us with evidence that long-distance wh-movement involves successive cyclic movement through intermediate spec-C positions – and hence that wh-movement is an inherently local operation. At a subsequent stage of derivation, the wh-QP which \textit{picture of himself} moves into spec-C in the main clause, so deriving the structure (67) associated with (66) \textit{Which picture of himself wasn’t he sure that Mary liked best}? (See Fox 2000 and Barss 2001 for more detailed discussion of related structures.)

A further argument that wh-movement is a local operation which moves wh-expressions one clause at a time is offered by McCloskey (2000), based on observations about quantifier stranding/ floating in West Ulster English. In this variety, a wh-word can be modified by the universal quantifier \textit{all}, giving rise to questions such as:

(69) \textit{What all did you get for Christmas?} (= ‘What are all the things which you got for Christmas?’)

McCloskey argues that in such sentences, the quantifier and the wh-word originate as a single constituent. He further maintains that under wh-movement, the wh-word \textit{what} can either pied-pipe the quantifier \textit{all} along with it as in (69) above, or can move on its own leaving the quantifier \textit{all} stranded. In this connection, consider the sentences below:

(70)(a) \textit{What all do you think that he’ll say that we should buy?}
(b) \textit{What do you think \textit{all} that he’ll say that we should buy?}
(c) \textit{What do you think that he’ll say \textit{all} that we should buy?}
(d) \textit{What do you think that he’ll say that we should buy \textit{all}?}

McCloskey claims (2000, p.63) that \textquote{All} in wh-quantifier float constructions appears in positions for which there is considerable independent evidence that they are either positions in which wh-movement
originates or positions through which wh-movement passes. We have in these observations a new kind of argument for the successive-cyclic character of long wh-movement.

McCloskey argues that the derivation of (70a-d) proceeds along the following lines (simplified in a number of ways). The quantifier all merges with its complement what to form the structure [all what]. The wh-word what then raises to become the specifier of all, forming the overt QP [what all]. (To simplify exposition, we only show the overt constituents of QP here, hence not the null copy of what following all.) The resulting QP [what all] is merged as the object of buy, forming [buy what all]. If what undergoes wh-movement on its own in subsequent stages of derivation, we derive (70d) ‘What do you think that he’ll say that we should buy all?’ But suppose that the quantifier all is pied-piped along with what under wh-movement until we reach the stage shown in skeletal form below:

(71) [CP what all [C that] we should buy]

If wh-movement then extracts what on its own, the quantifier all will be stranded in the most deeply embedded spec-C position, so deriving (70c) ‘What do you think that he’ll say all that we should buy?’ By contrast, if all is pied-piped along with what until the end of the intermediate C-cycle, we derive:

(72) [CP what all [C that] he’ll say that we should buy]

If wh-movement then extracts what on its own, the quantifier all will be stranded in the intermediate spec-C position and we will ultimately derive (70b) ‘What do you think all that he’ll say that we should buy?’ But if all continues to be pied-piped along with what throughout the remaining stages of derivation, we ultimately derive (70a) ‘What all do you think that he’ll say that we should buy?’

A further piece of evidence that wh-expressions move one clause at a time comes from auxiliary inversion in Belfast English. In her (1995) book on Belfast English, Alison Henry notes that in long-distance wh-questions in Belfast English, not only the main clause C but also intermediate C constituents show T-to-C movement (i.e. auxiliary inversion), as illustrated below:

(73) What did Mary claim [did they steal]? (Henry 1995, p.108)

We can account for auxiliary inversion in structures like (73) in a straightforward fashion if we suppose that (in this kind of variety) the head C of any clause which has an interrogative specifier can trigger auxiliary inversion. If so, the fact that the complement clause shows auxiliary inversion provides evidence that the preposed wh-word what moves through the spec-C position in the bracketed complement clause in (73) before subsequently moving into the main-clause spec-C position.

Overall, then, we see that there is a considerable body of empirical evidence which supports the hypothesis that long-distance wh-movement is successive-cyclic in nature and involves wh-expressions moving one clause at a time through intermediate spec-C positions (attracted by an edge feature on each of the relevant C constituents). Although we have focused on evidence from English here, it should be noted that there is additional evidence from a range of phenomena in other languages, including wh-copying in Frisian (Hiemstra 1986), Romani (McDaniel 1989), German (Felser 2004) and Afrikaans (Hong 2005), intermediate preposition stranding in Afrikaans (du Plessis 1977), partial wh-movement in German and a variety of languages (see e.g. Cole 1982, McDaniel 1986, Saddy 1991 and Cole and Hermon 2000), and exceptional accusative case-marking by a higher transitive verb of the wh-subject of a lower finite clause (reported for English by Kayne 1984, p.5 and for Hungarian by Bejar and Massam 1999, p.66).

5.7 Multiple wh-questions
So far, all the questions which we have looked at have contained only a single interrogative wh-expression. However, alongside such questions, we also find multiple wh-questions – i.e. questions containing more than one interrogative wh-expression. (See Dayal 2002 for discussion of the semantic properties of such questions.) A salient syntactic property of such questions in English is that only one of the wh-expressions can be preposed – as we can illustrate in relation to an echo question such as:

(74) He might think who has done what?

If we try and prepose the highlighted wh-words in (74), we find that only one of the two can be preposed (not both of them), and moreover the preposed item has to be who and not what:
Why should this be? In order to get a clearer idea of what’s going on here, let’s take a closer look at the derivation of (75a). The verb done merges with the interrogative pronoun what to form the VP done what. The present-tense T auxiliary has merges with this VP to form the T-bar has done what, and this in turn merges with the interrogative pronoun who to form the TP who has done what. The resulting TP is merged with a null declarative complementiser (a null counterpart of that, below shown as ø) with an edge feature, to form the C-bar shown below:

The edge feature on C enables it to attract a wh-expression which it c-commands to move to become the specifier of C. But an obvious problem which arises in the case of a structure like (76) is that there are two different wh-expressions c-commanded by the null complementiser, namely who and what. Since C can only attract a single wh-expression to move to spec-C, it is clear that only one of the two wh-words can move to spec-C – but which? Since it is who rather than what which must be preposed in (76) and since who is closer to C than what, let’s suppose that C attracts the closest interrogative word which it c-commands. This requirement is a consequence of a principle of Universal Grammar (proposed by Richards 1997 after Chomsky 1995, p.297) which we can outline informally as follows:

(77) **Attract Closest Principle/Acp**

A head which attracts a given kind of constituent attracts the closest constituent of the relevant kind (Chomsky 1995, p.311 proposes an analogous principle which he terms the **Minimal Link Condition** and formulates it thus: ‘K attracts α only if there is no β, β closer to K than α, such that K attracts β.’) It follows from ACP that an interrogative C carrying an edge feature will attract the (smallest possible maximal projection containing the) closest interrogative word to move to spec-C. So, since who is closer to C than what in (76), it is who which is attracted to move to spec-C. Using rather different but equivalent terminology, sentences like (75) can be said to show a **superiority effect** in that C has to attract the ‘highest’ constituent of the relevant type. A further alternative to the ACP account is to suppose that the relevant effect is a consequence of an **Intervention Constraint** to the effect that in a structure of the form […]X[…]Y[…]Z[…] [[X cannot attract Z if there is a constituent Y of the same type as Z which intervenes between X and Z: on this view, the presence of who intervening between C and what in (76) prevents C from attracting what to move to spec-CP.] The **Attract Closest Principle** can be subsumed within the Economy Condition (43), given that economy considerations require us to move the smallest possible maximal projection to spec-C. And since the Chain Uniformity Condition means that the moved constituent must be a maximal projection, the various conditions which UG imposes on movement mean that wh-movement will in effect be an operation along the lines specified in (78) below:

(78) C attracts the smallest possible maximal projection containing the closest wh-word

What this means is that we first identify the closest wh-word to C, and then move the smallest possible maximal projection containing it to spec-C.

After this brief excursus, let’s now return to the derivation of (75a) Who might he think has done what? Suppose that we have reached the stage of derivation in (76) above. In accordance with the Attract Closest Principle (77), C identifies who as the closest wh-word, and in compliance with the Chain Uniformity Principle (42) and the Economy Principle (43) attracts the smallest possible maximal projection containing who to move to spec-C. However, since who is itself a maximal projection (by virtue
of being the largest expression headed by the word *who*), this means that *who* is attracted to move to spec-C, thereby deriving the structure shown below:

(79)

As shown in (79), wh-movement leads to deletion of the edge feature on C, and to the original occurrence of *who* ultimately being given a null spellout.

The derivation continues by merging the CP in (79) as the complement of the verb *think*, forming the VP *think who ø who has done what*. This VP is then merged with the T-auxiliary *might* to form the T-bar *might think who ø who has done what*, and this in turn merges with the pronoun *he* to form the TP *he might think who ø who has done what*. The resulting TP is then merged with a C constituent which (as in all main-clause questions) carries a tense feature and an edge feature, so forming the following structure (simplified by not showing the internal structure of the complement-clause C-bar constituent, and by showing only the overt constituents of the complement clause):

(80)

In accordance with the Attract Closest Principle (77), the tense feature on C in (80) attracts the closest T-auxiliary (**might**) to move to C. In conformity with the same principle, the edge feature on C attracts the closest interrogative word (**who**) to move to become the specifier of C, so deriving the structure shown below (simplified in the same ways as for 80):
In short, the assumption that movement operations like wh-movement are subject to the Attract Closest Principle (77) provides a principled account of why it is who rather than what which undergoes wh-movement in (75). Moreover, given the assumption that the edge feature on C is immediately deleted (and thereby inactivated) once C has attracted the closest wh-expression, it follows that no more than one wh-expression can be moved to the front of any given clause.

### 5.8 Wh-subject questions

Underlying the analyses we have presented so far in this chapter is the assumption that interrogative clauses in English have the following syntactic properties:

- **(82)(i)** Interrogative clauses are CPs headed by a C with an edge feature which attracts the smallest possible maximal projection containing the closest interrogative wh-word to move to spec-C.
- **(82)(ii)** C in root/main interrogative clauses contains a [TNS] feature which attracts the closest tensed (i.e. present or past tense) T-constituent to adjoin to it.

The edge feature of C triggers movement of a wh-expression to spec-C; and the tense feature on C in main-clause questions triggers movement of an auxiliary or tense affix from T to C (with a moved tense affix being spelled out as a form of DO, as we saw in §4.8).

However, the assumptions made in (82) raise interesting questions about how we account for the contrast in (83) below:

- **(83)(a)** Who'd the police call (’d = did)
- **(83)(b)** *Who the police called?
- **(83)(c)** Who called the police?
- **(83)(d)** *Who’d call the police? (’d = did)

(83a/b) are wh-object questions, in the sense that the preposed interrogative expression who is the direct object complement of the verb call; as would be expected from the assumption in (82ii) that C in main-clause questions contains a tense feature, they require T-to-C movement and concomitant DO-support. By contrast, (83c/d) are wh-subject questions, in the sense that who is the subject of the verb call; contrary to what (82ii) would lead us to expect, wh-subject questions do not allow T-to-C movement and DO-support. (More precisely, do can only be used in a wh-subject question if it is emphatic, receives contrastive stress and is spelled out as the full form did – as in Who DID call the police? with capitals marking contrastive stress.) Why should this be?

One answer to this question (different versions of which are suggested in Radford 1997a and Agbayani 2000) is the following. Let’s suppose that T-to-C movement (and concomitant DO-support) is only found in questions in which a wh-expression moves to spec-C. In wh-object questions like (83a/b) it is clear that the wh-pronoun who moves to spec-C, since it is the object of the verb call and if it had not moved to spec-C, it would have been positioned after the verb (as in the echo-question The police called who?). But in wh-subject questions like (83c/d) it is by no means clear that the wh-pronoun who has moved into spec-C, since even if it remained in situ in spec-T it would still end up as the first overt constituent in the sentence. Let’s therefore consider the possibility that in sentences like (83c/d) where a wh-expression is
the subject of the overall interrogative clause, the wh-expression remains in situ in spec-T and does not move to spec-C. If T-to-C movement and concomitant DO-support are only found in questions which involve movement of a wh-expression to spec-C, and if wh-subject questions do not involve wh-movement to spec-C, we can seemingly account for the absence of DO-support in wh-subject questions like (83c/d).

On this view, the derivation of (83c) would proceed as follows. The determiner the merges with the noun police to form the DP the police. This DP is then merged with the verb call to form the VP call the police. The resulting VP is in turn merged with a past tense affix Af, forming the T-bar Af call the police. This T-bar is then merged with the pronoun who, forming the TP who Af call the police. If we follow Agbayani (2000) in supposing that all interrogative clauses are CPs, the resulting TP will be merged with an interrogative C to form the CP shown in simplified form below:

\[(84)\]

\[
\begin{array}{c}
\text{CP} \\
\hline
\text{C} \\
\hline
\text{TP} \\
\hline
\emptyset \\
\hline
\text{PRN} \\
\text{who} \\
\hline
\text{T} \\
\hline
\text{V} \\
\text{Af} \\
\text{call} \\
\text{the police} \\
\hline
\text{DP} \\
\end{array}
\]

The past tense affix in T will be lowered onto the main verb by Affix Hopping in the PF component, so that the verb is spelled out as called in (83c) Who called the police?

However, the spec-T analysis of wh-subjects outlined in (84) raises (but seemingly provides no principled answer to) the question of why the wh-pronoun who in (84) isn’t attracted to move to spec-C if C in an interrogative clause always has an edge feature triggering wh-movement, and likewise why there isn’t any T-to-C movement if C in a main-clause question always has a tense feature triggering auxiliary inversion – as claimed in (82) above. Moreover, the core assumption underlying the spec-T analysis (viz. that the wh-subject remains in spec-T in wh-subject questions like (83c) Who called the police?) is called into question by the observation made by Pesetsky and Torrego (2001) that who in (83c) can be substituted by who on earth or who the hell: cf.

\[(85)(a) \quad \text{Who on earth called the police?} \quad \text{(b) Who the hell called the police?}\]

As Pesetsky (1987) notes (and as the examples in (86) below illustrate), wh-expressions like who on earth and who the hell have the property that they cannot remain in situ, but rather must move to spec-C:

\[(86)(a) \quad \text{Who on earth/Who the hell is she going out with?} \quad \text{(b) *She is going out with who on earth/who the hell?}\]

If wh-expressions like those italicised in (86) always move to spec-C, it follows that the italicised subjects in (85) must likewise have moved to spec-C – and hence it is plausible to suppose that the same is true of the subject who in (83c) Who called the police? (See den Dikken and Giannakidou 2002 for more detailed discussion of the syntax and semantics of expressions like who the hell?)

Let’s therefore follow Pesetsky and Torrego in taking all wh-questions (including wh-subject questions) to be CPs which show movement of a wh-expression to spec-C. In particular, let’s suppose that after the TP who Af call the police has been formed, it is merged with an interrogative C constituent which carries tense and edge features, so forming the structure in (87) below (cf. (84) above):

\[(87)\]

\[
\begin{array}{c}
\text{CP} \\
\hline
\text{C} \\
\hline
\text{PRN} \\
\text{who} \\
\hline
\text{T} \\
\text{V} \\
\text{Af} \\
\text{call} \\
\text{the police} \\
\hline
\text{TP} \\
\end{array}
\]

The past tense affix in T will be lowered onto the main verb by Affix Hopping in the PF component, so that the verb is spelled out as called in (83c) Who called the police?
What we might expect to happen at this point is for the edge feature of C to attract who to move to spec-C, and for the tense feature of C to attract movement of the past tense affix Af from T to C, with the affix thereby stranded in C being spelled out as a form of the dummy auxiliary DO in the PF component. But such a derivation would wrongly predict that (83d) *Who'd call the police? is grammatical on the relevant interpretation (where ‘d’ is a contracted form of did). So it would seem that the tense feature of C does not attract the head T constituent of TP. So what does it attract?

The answer given by Pesetsky and Torrego is that the edge and tense features of C work in tandem in the sense that they jointly attract the nominative wh-pronoun who, with the edge feature of C ensuring that who moves to spec-C. A key assumption underlying Pesetsky and Torrego’s analysis is that the word who (by virtue of being the subject of a tensed clause) carries a tense feature as well as an interrogative feature. More specifically, they posit that agreement between T and its subject involves not only copying the person/number features of the subject onto T but also (conversely) copying the tense feature of T onto the subject. This is far from implausible from a cross-linguistic perspective, since in languages like Chamicuro, tense is overtly marked on subjects, as the following example shows:

(88) Y-áliyo ka ké:ni
     3-fall   thePAST rain   (‘The rain fell’ = ‘It rained’; example from Parker 1999, p.552)

In (88), the head D ka ‘the’ of the subject DP ka ké:ni ‘the rain’ is a past tense determiner (the corresponding non-past determiner being na), providing clear evidence of tense-marking on the subject. If tense-marking of subjects also takes place in English, we can assume that a tensed T will have a tensed subject, so that who in Who called the police? will be a past tense subject by virtue of being the subject of a past tense T. Now, at first sight this might seem implausible, since who doesn’t carry the regular past tense suffix -d: however, this is because -d is a verbal suffix which attaches only to (regular) verbs, hence not to a pronoun like who. Pesetsky and Torrego claim that the tense feature carried by the subject of a tensed clause in English is morphologically manifested as nominative case, so that a nominative subject is really the spellout of a subject carrying a (past or present) tense feature. On this view, who in (83c) Who called the police? will carry a tense feature which causes the subject pronoun to be spelled out as the tensed (nominative) form who, rather than as the accusative form whom or the genitive form whose.

In the light of these assumptions, let’s return to the stage of derivation we reached in (87) above. As assumed in (82), C in a main clause question carries a tense feature and an edge feature: the tense feature of C enables C to attract a tensed constituent to move to the edge of CP, and the edge feature of an interrogative C enables C to attract an interrogative expression to move to spec-C. One way of satisfying these requirements would be to move who from spec-T to spec-C, and move (a copy of) the Tense affix in T to C (with the affix in C being spelled out as an appropriately inflected form of DO). However (as we have already seen), this would wrongly predict that a sentence like (83d) *Who’d call the police? should be grammatical (where ‘d’ is a clitic form of did). Why should such a derivation (involving two movement operations, WH-MOVEMENT and T-TO-C MOVEMENT) lead to ungrammaticality? Pesetsky and Torrego’s answer is that simply moving who from spec-T to spec-C on its own (without T-to-C movement) can simultaneously satisfy the requirements of both features on C (viz. its tense feature and its edge feature), and The Economy Condition (43) dictates that a derivation involving a single movement operation M should be preferred to one involving both M and an additional movement operation. Movement of who to spec-C will satisfy the edge feature on C because it results in C having an interrogative specifier, and can at the same time satisfy the tense feature of C because who carries a tense feature (by virtue of being the
subject of a tensed clause). The resulting derived structure is as follows (with the arrow showing how wh-
movement applies):

\[(89)\]

\[
\text{CP} \quad \text{PRN} \quad \overset{\text{Who}}{\text{C'}} \quad \overset{\text{[TPS, EF]}}{\text{C}} \quad \overset{\varnothing}{\text{TP}} \quad \text{PRN} \quad \overset{\text{who}}{\text{T'}} \quad \overset{\text{T}}{\text{TP}} \quad \overset{\text{V}}{\text{VP}} \quad \overset{\text{DP}}{\text{DP}}
\]

Since movement of the tensed wh-pronoun who to spec-C is sufficient to satisfy the requirements of both
features carried by C, economy considerations dictate that T-TO-C MOVEMENT is unnecessary (hence not
permitted) in wh-subject question structures, Pesetsky and Torrego reason. (An incidental detail is that the
past tense affix in T will be subsequently be lowered onto the head V of VP in the PF component, with the
result that the verb *call* is ultimately spelled out as the past tense form *called*.)

A questionable aspect of Pesetsky and Torrego’s analysis is their claim that the subject of a finite
clause carries a tense feature: see Nordlinger and Sadler (2004) and Radford (2006) for arguments against
this assumption. However, there is a way in which we can revise their analysis while still retaining much
of the spirit behind it. This is to suppose that the tense feature on C is a T-feature which triggers
movement of something from the edge of the T-projection (i.e. from the head or specifier position in TP)
to the edge of C-projection (i.e. into the head or specifier position within CP). In an object question like
*Who are you calling?* the edge feature on C attracts *who* to move to spec-CP, and the tense feature on C
attracts the auxiliary *are* to move from T to C (movement of the subject from spec-TP to spec-CP being
barred because the spec-CP position is required for the preposed wh-expression). But in a subject question
like *Who called the police?* the edge and tense features on C can work together to jointly attract the wh-
pronoun *who* to move to spec-CP. Such an account captures the essential insight of Pesetsky and
Torrego’s analysis without the need to posit that subject pronouns carry a tense feature.

Pesetsky and Torrego’s analysis (whether revised along the lines suggested here or not) allows us to
maintain the generalisation in (82) that all main clause questions are CPs headed by a C constituent
carrying a tense feature and an edge feature. In non-subject questions, the requirements of the edge feature
of C are met by moving a wh-expression into spec-C, and the requirements of its tense feature are met by
T-to-C movement. But in questions where the attracted wh-expression is the subject of the interrogative
clause, the requirements of both features are met by moving the wh-subject into spec-C.

### 5.9 Exclamative and relative clauses

Although we have so far concentrated on interrogative clauses, there are a number of other types
of wh-clause found in English. These include exclamative clauses like:

\[(90)(a)\] *What fun we have had!*
\[(90)(b)\] *What a pain in the neck he must be!*
\[(90)(c)\] *How badly he is behaving!*
\[(90)(d)\] *How he longed to see her again!*

These show wh-movement of an (italicised) exclamative wh-expression (containing *what!* or *how!*) but no
auxiliary-inversion. Within the framework adopted here, we can account for this by supposing that wh-
exclamative clauses are CPs headed by an exclamative C – i.e. by a C containing an exclamative force
feature [EXCL-FORCE] – and that an exclamative C carries an edge feature requiring it to project a
specifier, but no tense feature to trigger auxiliary inversion. This means that when C merges with its TP
complement, (90a) will have the following structure:
If we suppose that (parallel to 25/32 above):

(92) A clause is interpreted as exclamative if (and only if) it is a CP with an exclamative specifier (i.e. a specifier containing an exclamative word)

it follows that the edge feature [EF] on C in an exclamative clause will have to trigger movement of an exclamative expression to spec-C, if the sentence is to be interpreted as exclamative in accordance with (92). In conformity with the Attract Closest Principle and the Economy Principle, C attracts the smallest maximal projection containing the closest exclamative wh-word, namely the QP what fun, resulting in the derived structure shown in simplified form below:

(93)

\[
\begin{align*}
\text{CP} & \quad \text{QP} \\
\text{what} & \quad \text{fun} \\
\text{C} & \quad [\text{EF}] \\
\text{T} & \quad \text{TP} \\
\text{we} & \quad \text{have} \\
\text{VP} & \quad \text{had} \\
\text{OP} & \quad \text{what} \quad \text{fun}
\end{align*}
\]

The auxiliary have remains in situ in the head T position of TP, since C in (91) and (93) does not have a tense feature and hence cannot attract have to move from T to C.

A further type of wh-construction are relative clauses like those bracketed below:

(94)(a) It’s hard to find someone [who you can relate to]  
(b) It’s hard to find someone [to whom you can relate]  
(c) Can you think of things [which she might need]?  
(d) Is there anybody [whose car I can borrow]?

They are called relative clauses because they contain a relative pronoun (who/whose/which) that ‘relates to’ (i.e. refers back to) an italicised antecedent in a higher clause (generally one which immediately precedes the bold-printed relative wh-expression). Each of the bracketed relative clauses in (94) contains a bold-printed wh-expression which has undergone wh-movement and thereby been positioned at the front of the bracketed relative clause. In (94b) the preposition to has been pied-piped along with the (relative) wh-pronoun whom, so that to whom is preposed rather than whom on its own; likewise in (94d) the noun car is pied-piped along with the genitive wh-pronoun whose.

Relative wh-clauses resemble exclamative wh-clauses in that they too show wh-movement without auxiliary inversion. We can therefore analyse them in a similar way, namely as CPs containing a C with an edge feature but no tense feature. On this view, the bracketed relative clause in (94a) would have the simplified structure shown below at the point where C is merged with its TP complement:

(95)  
\[
[C \theta_{EF}] [TP [\text{you} [T \text{can}]] [VP [V \text{relate}]] [PP [P \text{to} \text{who}]]]
\]
The edge feature of the null relative-clause C attracts the smallest possible maximal projection containing the **bold-printed** relative pronoun who – namely who (which is the maximal projection of the wh-word who). Who then moves to spec-C, thereby deleting the edge feature of C and so forming the CP (96) below:

\[(96) \ [cP \ who \ [c \ Φ_w] \ [TP \ you \ [T \ can] \ [VP \ [v \ relate] \ [TP \ [u \ to] \ who]]]\]

In more formal styles, whom is used in place of who and the Stranding Constraint prevents the preposition to from being stranded at the end of the relative clause. Consequently, in formal styles the preposition to has to be pied-piped along with the relative pronoun in order to ensure convergence, so that the whole PP to whom is moved to spec-C, deriving the structure shown in simplified form below:

\[(97) \ [cP \ to \ whom \ [c \ Φ_w] \ [TP \ you \ [T \ can] \ [VP \ [v \ relate] \ to \ whom]]\]

And (97) is the structure of the bracketed relative clause in (94b).

Although the relative pronoun is overtly spelled out as who/whom in structures like (96) and (97) above, relative pronouns in English can also be given a null spellout, so resulting in bare relative clauses (i.e. relative clauses which contain no overt relative pronoun) like those bracketed in the (b) examples below:

\[(98a) \ It’s \ hard \ to \ find \ people \ [who \ you \ can \ trust] \ (b) \ It’s \ hard \ to \ find \ people \ [you \ can \ trust]\]
\[(99a) \ This \ is \ something \ [which \ I \ will \ trust] \ (b) \ This \ is \ something \ [I \ will \ trust]\]
\[(100a) \ I \ know \ a \ place \ [where \ you \ can \ stay] \ (b) \ I \ know \ a \ place \ [you \ can \ stay]\]
\[(101a) \ I \ remember \ the \ time \ [when \ we \ first \ met] \ (b) \ I \ remember \ the \ time \ [we \ first \ met]\]
\[(102a) \ That’s \ the \ reason \ [why \ I \ was \ late] \ (b) \ That’s \ the \ reason \ [I \ was \ late]\]

Although the bare relative clauses in the (b) examples in (98-102) don’t contain an overt relative pronoun, there is reason to believe that they contain a null relative pronoun – and hence (e.g.) that (98b) contains a null counterpart of who. For one thing, the verb trust in (98b) is transitive and so requires a noun or pronoun expression as its complement: since trust has no overt object, it must have a null object of some kind. On the assumption that all relative clauses contain a relative pronoun, the object must be a relative pronoun (or relative operator, to use alternative technical terminology). For concreteness, let’s suppose that the object of the verb trust in (98b) is the relative pronoun who. If so, the bracketed relative clauses in (98a, b) will both have the structure shown below at the point where the null complementiser C is merged with its TP complement:

\[(103) \ [c \ Φ_w] \ [TP \ you \ [T \ can] \ [VP \ [v \ trust] \ who]]\]

The edge feature of the complementiser will attract the relative pronoun who to move to spec-C and is thereby deleted (along with the trace copy of the moved pronoun who), so deriving the CP (104) below:

\[(104) \ [cP \ who \ [c \ Φ_w] \ [TP \ you \ [T \ can] \ [VP \ [v \ trust] \ who]]\]

If we further suppose that the PF component permits a relative pronoun which occupies spec-C position in a relative clause to be given a null spellout, then who in (104) can be given a null spellout in the PF component, so deriving:

\[(105) \ [cP \ who \ [c \ Φ_w] \ [TP \ you \ [T \ can] \ [VP \ [v \ trust] \ who]]\]

One reason why the relative pronoun can be given a null spellout may be that its person/number/gender properties can be **identified** by its antecedent: e.g. who refers back to people in (98a) and so is identifiable as a third person plural animite pronoun even if deleted.

While the analysis of bare relative clauses sketched above is plausible, an important question to ask is whether there is any empirical evidence in support of the key assumption that bare relative clauses contain a relative pronoun which undergoes wh-movement in the same way as overt relative pronouns do. An interesting piece of evidence in support of a wh-movement analysis comes from **islandhood effects**. Ross (1967) noted that certain types of syntactic structure are **islands** – i.e. they are structures out of which no subpart can be moved via any kind of movement operation (the general idea behind his metaphor being that any constituent which is on an island is marooned there and can’t be got off the island by any
movement operation of any kind). One type of island identified by Ross are wh-clauses (i.e. clauses beginning with a wh-expression). In this connection, note the ungrammaticality of sentences like:

(106) *He is someone [who nobody knows [what the FBA did to]]

(intended to have a meaning which can be paraphrased somewhat clumsily as ‘He is someone such that nobody knows what the FBA did to him’). In (106), the relative pronoun who is the object of the preposition to, and is moved out of the bracketed did-clause to the front of the knows clause. However, the did-clause is a wh-clause (by virtue of being introduced by what) and wh-clauses are islands: this means that moving who out of the did-clause will lead to violation of Ross’s **wh-island constraint** forbidding any constituent from being moved out of a wh-clause. (See Sabel 2002 for a more detailed account of the constraint.)

What is of more immediate relevance to our claim that bare relative clauses contain a relative pronoun which undergoes wh-movement is that bare relative clauses exhibit the same islandhood effect, as we see from the ungrammaticality of:

(107) *He is someone [nobody knows [what the FBA did to]]

How can we account for this? Given our assumption that bare relative clauses contain a relative pronoun which moves to spec-C and is subsequently given a null spellout in the PF component, (107) will have the structure (108) below (simplified in numerous respects, including by not showing trace copies of moved constituents):

(108) *He is someone [CP who [C ø] nobody knows [CP what [C ø] they did to]]

The relative pronoun who is initially merged as the complement of the preposition to and is then moved out of the did-clause to the front of the knows clause, and receives a null spellout in the PF component. But since the did clause is a wh-clause (by virtue of containing the preposed wh-word what) and since wh-clauses are islands, movement of the relative pronoun out of the did-clause will lead to violation of the **wh-island constraint**. Thus, our assumption that bare relatives contain a relative pronoun that undergoes wh-movement provides a principled account of the ungrammaticality of structures like (107, 108).

In finite relative clauses like those bracketed in (98-102) above, the (italicised) relative pronoun can **optionally** be given a null spellout. But in infinitival relative clauses like those bracketed below, it is **obligatory** for a relative pronoun in spec-CP to have a null spellout: cf.

(109) (a) *Everyone needs someone [who to love] (b) Everyone needs someone [to love]
(110) (a) *I have no comment [which to make] (b) I have no comment [to make]
(111) (a) *I need a place [where to stay] (b) I need a place [to stay]
(112) (a) *It’s the right time [when to act] (b) It’s the right time [to act]
(113) (a) *There’s no reason [why to complain] (b) There’s no reason [to complain]

The bracketed structures in (109-113) above are control clauses, hence CPs containing a null intransitive complementiser and a null PRO subject. Given the assumptions made here, (109b) will have the partial, simplified structure shown in (114) below

(114) Everyone needs someone [CP who [C ø] PRO [T to] [VP [v love who]]]

The relative pronoun will move from VP-complement position to CP-specifier position, and obligatorily be given a null spellout.

It is also obligatory for a relative pronoun to be given a null spellout in infinitival relative clauses containing the transitive complementiser for – as we see from the examples below:

(115) (a) *Find someone [who for them to play with]! (b) Find someone [for them to play with]!
(116) (a) *Find a pen [which for me to write with]! (b) Find a pen [for me to write with]!
(117) (a) *I’ve got a place [where for him to stay] (b) I’ve got a place [for him to stay]
(118) (a) *This is the time [when for you to leave] (b) This is the time [for you to leave]
(119) (a) *There’s no reason [why for her to cry] (b) There’s no reason [for her to cry]
Accordingly, an infinitival relative clause like that bracketed in (115b) will contain a relative pronoun like who which is initially merged as the complement of the preposition with and then moves to become the specifier of the complementiser for, ultimately being given a null spellout.

So far, we have seen that relative pronouns in spec-CP are optionally given a null spellout in finite relative clauses, and obligatorily given a null spellout in non-finite (infinitival) relative clauses. However, there is an important complication which we have overlooked so far, which relates to pied-piping. In (both finite and non-finite) relative clauses in which other material is pied-piped along with the relative pronoun when it moves to the front of the relative clause, the relative pronoun cannot be null but rather must be overtly spelled out – as we see from the contrast below (where strikethrough is used to denote a ‘silent’ relative pronoun with a null spellout, and traces of moved wh-pronouns are omitted):

(120)(a) I need something [which I can write with]
(b) I need something [which I can write with] *I need something [with which I can write]
(c) I need something [with which I can write]
(d) I need something [with which I can write]

(121)(a) He is someone [who you can rely on]
(b) He is someone [who you can rely on] *He is someone [on whom you can rely]
(c) He is someone [on whom you can rely]
(d) *He is someone [on whom you can rely]

Why should it be that relative pronouns can have a null spellout in structures like (120b, 121b), but not in structures like (120d, 121d)?

The reason seems to be related to a difference in the superficial position occupied by the relative pronoun in the two types of clause. This positional difference becomes apparent if we compare the superficial structure of the bracketed relative clauses in (120a, b) with that of the relative clause in (120c, d), shown in (122) below:

(122)(a) CP PRN which C TP ø I can write with which
(b) CP PP P PRN C TP with which ø I can write with which

In (122a), the italicised relative pronoun which ends up (at the end of the syntactic derivation) as the specifier of the null complementiser heading the relative clause, and can be given a null spellout. By contrast, in (122b) the relative pronoun remains the complement of the preposition with throughout the derivation, and it is the whole PP with which that is in spec-C. The descriptive generalisation which this suggests is the following:

(123) Relative Pronoun Spellout Condition/RPSC

A relative pronoun occupying spec-C position in a relative clause is given a null spellout at PF (optionally in a finite clause, obligatorily in a non-finite clause)

In accordance with RPSC, which can receive a null spellout in (122a) by virtue of occupying CP-specifier position, but not in (122b) by virtue of occupying PP-complement position. (An alternative possibility – which we will not pursue here – is that a relative pronoun like which that moves on its own without pied-piping additional material moves into the head C position of CP and can there be given a null spellout in much the same way as a complementiser like that.)

Since it is obligatory for a relative pronoun in spec-C to receive a null spellout in a non-finite relative clause, relative pronouns in non-finite relative clauses are spelled out differently from their finite counterparts – as we can see by comparing the examples in (120) above with those in (124) below:

(124)(a) *I need something [which to write with]
(b) I need something [which to write with]
(c) I need something [with which to write]
(d) *I need something [with which to write]

The key difference is that whereas a relative pronoun which occupies the specifier position in a finite relative clause can either have an overt spellout as in (120a) or a null spellout as in (120b), a relative pronoun which occupies spec-C in an infinitival relative clause obligatorily receives a null spellout as in (124b), and cannot be overtly spelled out – as we see from the ungrammaticality of (124a).

In addition to wh-relatives like the (a) examples in (98-102) above and bare relatives like the corresponding (b) examples, we also find relative clauses introduced by that like those bracketed below:
(125)(a) It’s hard to find people [that you can trust]
(b) There is little [that anyone can do]
(c) We now have computers [that even a child can use]

What’s the status of that in such clauses? One answer (suggested by Sag 1997) is that the word that is a relative pronoun which behaves in much the same way as other relative pronouns like who and which. However, an alternative analysis which we will adopt here is to take that to be a relative clause complementiser (= C). The C analysis accounts for several properties of relative that. Firstly, it is homophonous with the complementiser that found in declarative clauses like that bracketed in:

(126) I said [that you were right]

and has the same phonetically reduced exponent /ðət/. Secondly, (unlike a typical wh-pronoun) it can only occur in finite relative clauses like those bracketed in (125) above, not in infinitival relative clauses like those bracketed below:

(127)(a) The director is looking for locations [in which to film a documentary about the FBA]
(b) *The director is looking for locations [that to film a documentary about the FBA in]

Thirdly, unlike a typical wh-pronoun such as who (which has the formal-style accusative form whom and the genitive form whose), relative that is invariable and has no variant case-forms – e.g. it lacks the genitive form that’s in standard varieties of English, as we see from (128) below:

(128)(a) Lord Lancelot Humpalot is someone [whose ego is even bigger than his libido]
(b) *Lord Lancelot Humpalot is someone [that’s ego is even bigger than his libido]

Fourthly, unlike a typical wh-pronoun, that does not allow pied-piping of a preposition: cf.

(129)(a) There are still diseases [for which there is no cure]
(b) *There are still diseases [for that there is no cure]

Observations such as these suggest that relative that is a complementiser rather than a relative pronoun, and hence that it occupies the head C position in the relative clause CP which it introduces. However, given the assumption that all relative clauses contain a relative pronoun, relative clauses headed by that will also contain a relative pronoun which moves to spec-C and which is ultimately given a null spellout in the PF component. The analysis of relative clause that as a complementiser which attracts a wh-pronoun to become its specifier is lent some plausibility by the fact that in earlier varieties of English we found relative clauses containing an overt (preposed) wh-pronoun followed by the complementiser that – as the following examples illustrate:

(130)(a) In every peril [which that is to drede]... (Chaucer, Troilus and Criseyde)
(b) He hathe seyd that he woulde lyfte them [whom that hym plese] (Middle English, from Traugott 1972, p.156)

Moreover, we have syntactic evidence from island constraints in support of analysing that-relatives in present-day English as involving movement of a relative pronoun to spec-CP. For example, relative clauses containing that show the same wh-island sensitivity as relative clauses containing an overt wh-pronoun like who: cf.

(131)(a) *He is someone [who nobody knows [what the FBA did to]]
(b) *He is someone [that nobody knows [what the FBA did to]]

This parallelism suggests that the derivation of that-relatives involves a relative pronoun moving to the spec-C position within the relative clause and subsequently being given a null spellout at PF, with the ungrammaticality of (131a, b) being attributed to the fact that the relative pronoun originates as the complement of the preposition to and is extracted out of the bracketed what-clause in violation of the wh-island constraint.

This being so, the bracketed relative clause in (125a) It’s hard to find people [that you can trust] will involve merging a relative pronoun like who as the object of the verb trust, so that the relative clause has the structure shown below at the point where the complementiser that is merged with its TP complement:

(132) [C that[wh]] [TP you [T can] [VP [v trust] who]]
The edge feature of the complementiser *that* will attract the relative pronoun *who* to become the specifier of *that* and is thereby deleted (along with the trace copy of the moved pronoun *who*), so deriving the CP (133) below:

(133) $[CP\ who\ [c\ that]\ [TP\ you\ [TP\ can\ [VP\ [v\ trust\ who]]]]$

The spellout condition (123) will allow the relative pronoun to be given a null spellout in the PF component, so deriving:

(134) $[CP\ who\ [c\ that]\ [TP\ you\ [TP\ can\ [VP\ [v\ trust\ who]]]]$

and (134) is the structure of the bracketed relative clause in (125a).

However, an important complication arises at this point. After all, our Relative Pronoun Spellout Condition/RPSC (123) tells us that a relative pronoun is *optionally* given a null spellout in a finite clause. So, while we would expect a structure like (134) in which the relative pronoun has a null spellout to be grammatical, we would also expect a structure like (133) to be grammatical in which the relative pronoun is overtly spelled out as *who*. It might at first sight seem as if we can get round this problem by modifying RPSC so as to specify that a relative pronoun is obligatorily given a null spellout in a relative clause headed by the complementiser *that*. However, this will not account for the fact that relative clauses headed by *that* are also ungrammatical if other material is pied-piped along with the relative pronoun: cf.

(135)(a) *Colombo has found the weapon [with which *that she was killed]*
(b) *She is someone [on whom *that you can rely]*

And indeed, the same is true of infinitival relative clauses headed by the complementiser *for*: cf.

(136)(a) *Try and find something [with which *for me to write]*
(b) *There must be someone [in whom *for me to confide]*

Why should sentences like (135) and (136) be ungrammatical?

The answer given to this question by Chomsky and Lasnik (1977) is that such sentences violate a constraint operating in present-day English which they call the *Multiply Filled COMP Filter/MFCF*, and which we can outline informally as follows:

(137) **Multiply Filled COMP Filter/MFCF**

Any CP containing an overt complementiser (*that*/*if*/*for*) with an overt specifier is ungrammatical.

The relevant ‘filter’ may be reducible to a lexical property of overt complementisers (namely that they don’t allow an overt specifier). Be that as it may, MFCF helps us account for contrasts such as the following in present-day English:

(139)(a) *They’re looking for places *[CP which [c that] FBA agents can hide]*
(b) *They’re looking for places *[CP in which [c that] FBA agents can hide]*
(c) *They’re looking for places *[CP which [c for] FBA agents to hide]*

(140)(a) *They’re looking for places *[CP which [c for] FBA agents to hide]*
(b) *They’re looking for places *[CP in which [c for] FBA agents to hide]*
(c) *They’re looking for places *[CP which [c for] FBA agents to hide]*

Sentences like (139a, b) and (140a, b) violate MFCF because they contain an overt wh-expression (*which* or *in which*) that serves as the specifier of an overt complementiser (*that* or *for*): (140b) is also ruled out by the spellout condition (123) which requires a relative pronoun which occupies the specifier position in a non-finite relative clause to have a null spellout. By contrast, (139c) and (140c) involve no violation of MFCF because they contain a *null* relative pronoun which serves as the specifier of an overt complementiser.

In some varieties of English, MFCF seems to have a rather different form, permitting *wh+that* clauses like that bracketed (141a) below, but not those like that bracketed in (141b):

(141)(a) *%I really don’t know [what kind of plan *that he has in mind]*
(b) *I really don’t know [what *that he has in mind]*

Zwicky (2002) claims that the relevant varieties permit *wh+that* structures when the wh-expression is a
wh-phrase like *what kind of plan*, but not when it is a wh-pronoun like *what*: this suggests that (in the
varieties concerned) MFCF prevents an overt complementiser having an overt *pronominal* specifier. If so,
it could be that in the relevant varieties, a wh-phrase moves to spec-C but a solo wh-word moves to C (and
is unable to move to C when C is already filled by a complementiser like *that*).

A final descriptive detail which should be noted is that our discussion of relative clauses in this section
and the last has concentrated on *restrictive relative clauses*, so called because in a sentence such as:

(142)  I saw the man [(who/that) they arrested] on TV

the bracketed relative clause restricts the class of men being referred to in the sentence to the one who they
arrested. A different type of clause are *appositive relative clauses* like those italicised below:

(143)(a)  John (*who used to live in Cambridge*) is a very good friend of mine
(b)     Yesterday I met my bank manager, *who was in a filthy mood*
(c)     Mary has left home – *which is very upsetting for her parents*

They generally serve as ‘parenthetical comments’ or ‘afterthoughts’ set off in a separate intonation group
from the rest of the sentence in the spoken language (this being marked by parentheses, or a comma, or a
hyphen in the written language). Unlike restrictives, appositives can be used to qualify unmodified proper
nouns (i.e. proper nouns like *John* which are not modified by a determiner like *the*). Moreover, they are
always introduced by an overt relative pronoun, as we see in relation to the parenthesised appositive
relative clauses below:

(144)(a)  John (*who you met last week*) is a good friend of mine
(b)     *John (*that you met last week*) is a good friend of mine
(c)     *John (*you met last week*) is a good friend of mine

Furthermore, whereas a restrictive relative clause like that bracketed in (145a) below can be *extraposed*
(i.e. moved) to the end of the containing clause and thereby be separated from its italicised antecedent, an
appositive relative clause like that bracketed in (145b) does not allow *extraposition*:

(145)(a)  A man has been arrested [*who the police want to interview about a series of burglaries*]
(b)     *John has been arrested [*who the police want to interview about a series of burglaries*]

A third type of relative clause are so-called *free relative clauses* such as the italicised in:

(146)(a)  *What you say is true*  (b)   *I will go where you go*
(c)     *I don’t like how he behaved towards her*

They are characterised by the fact that the wh-pronoun *what/where/how* appears to be antecedentless, in
that it doesn’t refer back to any other constituent in the sentence. Moreover, the set of relative pronouns
found in free relative clauses is slightly different from that found in restrictives or appositives: e.g. *what*
and *how* can serve as free relative pronouns, but not as appositive or restrictive relative pronouns; and
conversely *which* can serve as a restrictive or appositive relative pronoun but not as a free relative
pronoun. Appositive relatives (discussed in Citko 2002) and free relatives are interesting in their own
right, but we shall not attempt to explore their syntax here.

Although there are many interesting aspects of relative clauses which we will not go into here, the brief
outline given in this section suffices for the purpose of underlining that it is not only interrogative
wh-expressions which undergo wh-movement, but also exclamative wh-expressions and relative
wh-expressions (with the latter showing null spellout of a wh-pronoun in certain types of clause). Indeed,
there are a range of other constructions which have been claimed to involve wh-movement of a null
wh-operator, including comparative clauses like (147a) below, *as*-clauses like (147b), and so-called *tough-
clauses* like (147c):

(147)(a)  It is bigger than *I expected it to be*
(b)     Ames was a spy, *as the FBI eventually discovered*
(c)     Syntax is tough to understand

It is interesting to note that (147a) has a variant form containing the overt wh-word *what* in some
(nonstandard) varieties of English, where we find *It is bigger than *what* I expected it to be*: see Kennedy
and Merchant (2000), Lechner (2001), and Kennedy (2002) for discussion of comparative structures; see
also Potts (2002) for discussion of *as*-structures like (147b). We will not attempt to fathom the syntax of constructions like those in (147) here, however.

5.10 Summary

We began this chapter in §5.2 by arguing that main-clause wh-questions are CPs headed by a C constituent which attracts a tensed auxiliary to move to C via head movement, and a wh-expression to move into spec-C via wh-movement. In §5.3 we argued that wh-movement involves a copying operation whereby a moved wh-expression leaves behind a null copy of itself at its extraction site (i.e. in the position out of which it is extracted/moved); and we noted that in earlier work, copies were analysed as traces. In §5.4 we outlined an analysis of wh-questions under which an interrogative C carries an edge feature which attracts an interrogative wh-word to move to spec-C, and also (in main-clause questions) a tense feature which triggers auxiliary inversion. We saw that wh-movement provides a way of satisfying the constraint that a CP is only interpreted as a non-echoic question if it has an interrogative specifier. We also saw that the same constraint also requires us to assume that yes-no questions are CPs containing a null yes-no question operator (which can be thought of as a null counterpart of whether). In §5.5 we noted that (in consequence of the Chain Uniformity Condition) an interrogative word like which heading a larger phrase like which assignment cannot be preposed on its own, since this would violate the Chain Uniformity Condition, but rather has to pied-pipe the noun assignment along with it (e.g. in a sentence like Which assignment have you done?) We saw that pied-piping of the noun assignment along with the wh-word which was the consequence of an Economy Condition which requires movement of the smallest possible constituent containing the wh-word. We also noted that (since only heads and maximal projections can undergo grammatical operations) when a wh-word cannot move on its own, the smallest possible phrase (i.e. maximal projection) containing the wh-word moves instead, so that C attracts the smallest possible maximal projection containing an interrogative word to move to spec-C. We went on to note that in formal styles of English, a wh-expression which is the complement of a preposition pied-pipes the preposition along with it when it undergoes wh-movement, so that the whole prepositional phrase moves to spec-C in sentences like To whom was he referring? We further noted Chomsky’s suggestion that this is because in formal styles of English there is a Stranding Constraint which prevents prepositions from being stranded, and the Economy Principle therefore requires the next smallest maximal projection containing whom to move to spec-C – i.e. the prepositional phrase to whom. We also noted that Ross’s Left Branch Condition prevents genitive possessors like whose from being extracted out of the DP containing them, with the result that the whole DP containing whose has to be preposed in sentences such as Whose car have you borrowed? In §5.6, we presented evidence that wh-movement in long-distance questions like What might he think that she is hiding? applies in a successive-cyclic fashion (one clause at a time), with what first moving into the spec-C position at the front of the that-clause before subsequently going on to move into the spec-C position in the main clause. We noted that successive-cyclic application of wh-movement is forced by UG principles such as Chomsky’s Subjacency Condition (which only allows movement out of one TP at a time) or Rizzi’s Relativised Minimality Condition (requiring a moved expression to move to the nearest appropriate landing site). In §5.7, we looked at the syntax of multiple wh-questions, noting that in consequence of the Attract Closest Principle, C in multiple wh-questions attracts the closest wh-word which it c-commands. We noted that this condition (in conjunction with the Chain Uniformity and Economy conditions) means that the edge feature on C attracts the smallest possible maximal projection containing the closest wh-word to move to spec-C. In §5.8 we discussed the syntax of wh-subject questions like Who called the police? and noted that such questions do not involve auxiliary inversion. We outlined Pesetsky and Torrego’s account under which the relevant clauses are CPs, with the edge and tense features of C jointly attracting the wh-subject to move from spec-T to spec-C (the relevant wh-subject being assumed to carry a copy of the tense feature carried by T). In §5.9 we discussed the syntax of exclamative clauses, arguing that these are CPs in which the head C constituent carries an edge feature, but no tense feature: hence, exclamative clauses involve wh-movement without auxiliary inversion. We went on to look at the derivation of relative clauses, arguing that this involves movement to spec-C of a maximal projection comprising or containing a relative pronoun, with a relative pronoun receiving a null spellout (under certain conditions) when occupying spec-C. We noted that in consequence of the Multiply Filled COMP Filter (which bars an overt complementiser from having an overt specifier), the complementiser or relative pronoun (or both) must receive a null spellout in relative clauses.
Overall, the main main point of this chapter has been to look at the syntax of preposed (interrogative, exclamative and relative) wh-expressions. All three types of expression end up (via movement) in an A-bar position – i.e. a specifier position which can be occupied by either an argument or an adjunct. Because it moves wh-expressions into spec-C and spec-C is an A-bar position, wh-movement can be regarded as a particular instance of a more general A-bar movement operation. (As should be obvious, the term A-bar here is used in an entirely different manner from the way we employed it in 3.5, when we claimed that in an adjectival phrase like very proud of him, the string proud of him is an A-bar constituent and thus an intermediate projection of the adjective proud.)

**WORKBOOK SECTION**

**Exercise 5.1**
Discuss the derivation of the wh-clauses below, drawing tree diagrams to show their superficial structure and saying why they are grammatical or ungrammatical in standard varieties of English.

1a Which film have you seen?  
1b *Which have you seen film?  
2a Dare anyone say anything?  
2b Who hit him?  
3a Who have they spoken to?  
3b Who’ve they spoken to?  
3c To whom? To who have they spoken?  
3d *To who’ve they spoken?  
4a Which picture of who have you chosen?  
4b *Which picture of who’ve you chosen?  
4c *Who’ve you chosen which picture of?  
4d Which picture have you chosen of who?  
5a What excuse has he given?  
5b *What has he given excuse?  
5c *What excuse he has given?  
5d *What he has given excuse?  
6a How many places has he hidden in?  
6b In how many places has he hidden?  
6c *How has he hidden in many places?  
6d *In how many has he hidden places?  
7a Who? Whom do you think that they were talking to?  
7b To whom? To who do you think that they were talking?  
8a Whose car will he think has crashed into what?  
8b *Whose will he think car has crashed into what?  
8c *What will he think whose car has crashed into?  
9a He is wondering who has done what  
9b *He is wondering what who has done  
9c *Who is he wondering has done what?  
9d *What is he wondering who has done?

In addition, discuss the syntax of child wh-questions like that in (10) below:

10 Who will he think who the cat was chasing? ( = ‘Who will he think the cat was chasing?’)

And comment on relevant aspects of the syntax of the which/how clauses in (11) below:

11a To which of these groups do you consider that you belong to?  
11b May we ask you to indicate which of these ethnic groups that you belong to?  
11c It’s difficult to see how that we can keep these players

(11a and 11b being from an official form issued by the Tax Office in the town I live in, and 11c produced by a famous English soccer interviewed on TV). Say what is interesting about the which/how clauses in (11), what their counterparts would be in ‘standard’ varieties of English, and how the two varieties differ.

Finally, comment on relevant aspects of the syntax of the Shakespearean questions in (12) below, the African American English questions in (13) (from Green 1998, pp.98-99), the bracketed interrogative complement clauses in Belfast English (adapted from Henry 1995) in (14/15), and the bracketed exclamative complement clause in (16) (produced by an interviewee on BBC radio 5):

12a What sayst thou? (Olivia, Twelfth Night, III.iv)  
12b What dost thou say? (Othello, Othello, III.iii)  
12c What didst not like? (Othello, Othello, III.iii)
13a What I’m gon’ do? (= ‘What am I going to do?’)
  b   How she’s doing? (= ‘How is she doing?’)
14a They wondered [which one that he chose]
  b   They wondered [which one did he choose]
  c   *They wondered [which one that did he choose]
15a They wondered [if/whether (*that) we had gone]
  b   *They wondered [if/whether had we gone]
  c   They wondered [had we gone]
16 I’m surprised at [how hostile she’s had a reaction]

Helpful hints
In 2a, assume that dare, anyone and anything are polarity items (in a sense made precise in exercise 2.2), and so must be c-commanded by an interrogative constituent; assume also that dare originates in T. In 3 and 7, a prefixed question mark ? indicates that the use of who(m) in the relevant sentence (for speakers like me) leads to stylistic incongruity (in that the accusative form whom and preposition pied-piping are used in more formal styles, and the accusative form who and preposition stranding in less formal styles). In 3 and 4, assume (for the purposes of this exercise) that have can cliticise onto a preceding word W if W ends in a vowel or diphthong, if W asymmetrically c-commands have and if there is no (overt or null) constituent intervening between W and have. In 4, take which picture of who to be a QP formed by merging the quantifier which with the NP picture of who. In 6, take how many places to be a QP formed by merging the Q many with the N places to form the Q-bar many places and assume that this Q-bar is then merged with the wh-adverb how to form the QP how many places (so that the degree adverb how is the specifier of this QP): note that, irrelevantly, 6c is grammatical on a different interpretation on which how is a manner adverb with a meaning paraphraseable as ‘In what way?’ In 9, bear in mind the assumption in the main text that a clause can only be interpreted as a non-echoic wh-question if it is a CP with a specifier containing an interrogative word. In 10, bear in mind that the same child also produced How much do you think how much the bad guy stole? In 11b and 11c, concern yourself only with the structure of the which/how-clauses, not with the structure of the main clause; and take these ethnic groups to be a DP but don’t concern yourself with its structure. In 15, consider the possibility that both if and whether are complementisers in Belfast English (though only if is a complementiser in Standard English). In 16, take how hostile to be an adjectival phrase which (prior to wh-movement) is the specifier of the indefinite article a (but don’t concern yourself with the internal structure of how hostile

Model answer for (1)
(1a) is derived as follows. The interrogative quantifier which is merged with the noun film to form the QP which film. This is merged with the (perfect participle) verb seen to form the VP seen which film. This is then merged with the (present) tense auxiliary have to form the T-bar have seen which film. The resulting T-bar is merged with the pronoun you to form the TP you have seen which film. This TP is merged with a null C constituent carrying a tense feature and an edge feature, so forming the C-bar in (i) below:

(i)  
   C'  
     C  
       [TNS, EF]  
         φ  
           PRN  
             you  
               T'  
                 T  
                   have  
                     V  
                       seen  
                         Q  
                           QP  
                             N  
                               which  
                                 film
The tense feature of C attracts the present tense auxiliary have to move from T to C. In consequence of the Chain Uniformity Condition, the Economy Condition and the Attract Closest Principle (and for reasons which I leave you to work out for yourself), the edge feature of C attracts the smallest possible maximal projection containing the closest interrogative word to move to spec-C. Since the closest interrogative word to C (and indeed the only interrogative word in the structure) is which, and the smallest maximal projection containing which is the QP which film, and since preposing this QP on its own leads to a convergent derivation which does not violate any syntactic constraints, the QP which film moves to spec-C. Assuming that the features of C are deleted once their requirements are satisfied, the structure which results after head-movement and wh-movement have applied is that shown in simplified form below:

(ii)                             CP
QP                                               C
|                                  | TP
| which film                        | [TNS, EF]
C                                            PRN
[have+ø]                  you             T'
T                        VP
have     seen which film

Exercise 5.2
Discuss the derivation of the bracketed restrictive relative clauses in the sentences below, drawing tree diagrams to show their superficial structure and saying why they are grammatical or ungrammatical in standard varieties of English:

1a  There is no-one [who you can talk to]     b  There is no-one [you can talk to]
c  *There is no-one [to whom you can talk]   d *There is no-one [to you can talk]
2a  *There is no-one [who that you can talk to] b  There is no-one [that you can talk to]
c  *There is no-one [to whom that you can talk] d *There is no-one [to that you can talk]
3a  There is no-one [for you to talk to]     b  There is no-one [to talk to]
c  *There is no-one [for whom you to talk to] d *There is no-one [for whom you to talk]
4a  *This is the way [how he behaved]        b  This is the way [he behaved]
c  *This is the way [how that he behaved]    d  This is the way [that he behaved]
5a  *I need someone [who to love me]         b  I need someone [to love me]
c  *I need someone [who to love]            d  I need someone [to love]
6a  I need a place [in which to stay]        b  *I need a place [in to stay]
c  *I need a place [which to stay in]       d  I need a place [to stay in]
e  *I need a place [where to stay]          f  I need a place [to stay]
7a  *I need a place [in which for her to stay] b  *I need a place [in for her to stay]
c  *I need a place [which for her to stay in] d  I need a place [for her to stay in]
e  *I need a place [where for her to stay]   f  I need a place [for her to stay]
8a  *This is no way [how to behave]         b  This is no way [to behave]
c  *This is no way [how for you to behave]   d  This is no way [for you to behave]

In addition, comment on the syntax of the bracketed relative clause in the sentence in (9) below (produced by a sports commentator on Sky TV):

9  As Liverpool chase the game, there may be more room [in which for Manchester United to manoeuvre] and say what its ‘standard English’ counterpart would be and why. Finally, say what is interesting about the which-clause in the following sentence (produced a former manager of the Northern Ireland soccer team in a radio interview):
It’s a great opportunity to get a win, which we haven’t had a competitive win for over four years

**Helpful hints**
In relation to 4 and 8, assume that *how* is a pronominal manner adverb (which you can categorise as ADV or PRN) which originates as the complement of the verb *behave*: try and identify the way in which *how* differs from other restrictive relative pronouns like *who/which/where/why.*

**Model answer for (1a/b)**
1a is derived as follows. The preposition *to* merges with the wh-pronoun *who* to form the PP *to who*. This is merged with the verb *talk* to form the VP *talk to who*. The resulting VP is merged with the present tense auxiliary *can* to form the T-bar *can talk to who*, and this is then merged with the subject *you* to form the TP *you can talk to who*. This TP is subsequently merged with a null complementiser (perhaps a null counterpart of *that*) which carries an edge feature, so deriving the structure shown in (i) below:

(i)

```
C'  TP
  |  PRN    T'
  |      VP
  |      PP
C     | you     | can
[EF]  |         | talk
ø    |         | to
      |         | who

The edge feature of C attracts the smallest possible maximal projection containing a relative pronoun to move to spec-C. The smallest such maximal projection is the pronoun *who*, which is a maximal projection containing a relative pronoun by virtue of being the largest expression headed by the relative pronoun *who*. Hence, *who* moves to spec-C, and thereby erases the edge feature of C, so deriving the structure shown in simplified form below, which is the superficial structure of the bracketed relative clause in 1a:

(ii)

```
CP
  | PRN    C'
  |        | TP
  | who    | you
  |        | can
to

Given that a relative pronoun occupying the specifier position in a relative clause can be given a null spellout in the PF component, an alternative possibility is for the relative pronoun *who* in spec-C to be given a null spellout at PF, so deriving (iii) below, which is the superficial structure associated with the bracketed relative clause in 1b:

(iii)

```
CP
  | PRN    C'
  | who    | TP
  |        | you
to

```
6.

A movement

6.1 Overview
In this chapter, we look at the syntax of subjects. So far, we have assumed that subjects originate in the specifier position within TP and remain in situ (except where the subject undergoes wh-movement and moves to spec-C, e.g. in sentences like Who did he say was coming?). However, in this chapter we shall argue that subjects originate internally within the Verb Phrase as arguments of verbs, and are subsequently raised into the specifier position within TP, with the relevant movement operation being triggered by an [EPP] feature carried by T. Since spec-T is an A-position (i.e. a position which can generally only be occupied by argument expressions), the operation by which subjects move into spec-T is traditionally known as A-movement.

6.2 Subjects in Belfast English
Let’s begin our discussion of the syntax of subjects by looking at some interesting data from Belfast English (kindly supplied to me by Alison Henry). Alongside Standard English constructions like (1a/b) below:

(1)(a) Some students should get distinctions  (b) Lots of students have missed the classes

Belfast English also has structures like (2a/b):

(2)(a) There should some students get distinctions  (b) There have lots of students missed the classes

Sentences like (2a, b) are called expletive structures because they contain the expletive pronoun there. (The fact that there is not a locative pronoun in this kind of use is shown by the impossibility of replacing it by locative here or questioning it by the interrogative locative where? or focussing it by assigning it contrastive stress.) For the time being, let’s focus on the derivation of Belfast English sentences like (2a, b) before turning to consider the derivation of Standard English sentences like (1a/b).

One question to ask about the sentences in (2a, b) is where the expletive pronoun there is positioned. Since there immediately precedes the tensed auxiliary should/have, a reasonable conjecture is that there is the subject/specifier of should/have and hence occupies the spec-T position. If this is so, we’d expect to find that the auxiliary can move in front of the expletive subject (via T-to-C movement) in questions – and this is indeed the case in Belfast English, as the sentences in (3) below illustrate:

(3)(a) Should there some students get distinctions?  (b) Have there lots of students missed the classes?

But what position is occupied by the underlined quantified expressions some students/lots of students in (3)? Since they immediately precede the verbs get/missed and since subjects precede verbs, it seems reasonable to conclude that the expressions some students/lots of students function as the subjects of the verbs get/missed and (since subjects are typically specifiers) occupy spec-V (i.e. specifier position within VP). If these assumptions are correct, (2a) will have the structure (4) below (simplified by not showing the internal structure of the expressions some students/distinctions: we can take both of these to be QP/Quantifier Phrase expressions, headed by the overt quantifier some in one case and by a null quantifier [Q ø] in the other):

...
The analysis in (4) claims that the sentence contains two subjects/specifiers: there is the specifier (and syntactic subject) of should, and some students is the specifier (and semantic subject) of get.

Given the assumptions in (4), sentence (2a) will be derived as follows. The noun distinctions merges with a null quantifier [ø,ø] to form the QP ø distinctions. By virtue of being the complement of the verb get, this QP is merged with the V get to form the V-bar (incomplete verb expression) get ø distinctions. The resulting V-bar is then merged with the subject of get, namely the QP some students (itself formed by merging the quantifier some with the noun students), so deriving the VP some students get ø distinctions. This VP is in turn merged with the past-tense T-auxiliary should, forming the T-bar should some students get ø distinctions. Let’s suppose that every T constituent has an [EPP] feature requiring it to have a noun or pronoun expression as its specifier. In sentences like (2a, b) in Belfast English, the requirement for T to have such a specifier can be satisfied by merging expletive there with the T-bar should some students get ø distinctions, so forming the TP There should some students get ø distinctions. The resulting TP is then merged with a null declarative complementiser, forming the CP shown in (4) above.

But what about the derivation of the corresponding Standard English sentence (1a) Some students should get distinctions? Let’s suppose that the derivation of (1a) runs parallel to the derivation of (2a) until the point where the auxiliary should merges with the VP some students get ø distinctions to form the T-bar should some students get ø distinctions. As before, let’s assume that [T should] has an [EPP] feature requiring it to project a structural subject/specifier. But let’s also suppose that the requirement for [T should] to have a specifier of its own cannot be satisfied by merging expletive there in spec-T because in standard varieties of English there can generally only occur in structures containing an intransitive verb like be, become, exist, occur, arise, remain etc. Instead, the [EPP] requirement for T to have a subject with person/number properties is satisfied by moving the subject some students from its original position in spec-V into a new position in spec-T, in the manner shown by the arrows below:

Since spec-T is an A-position which can only be occupied by an argument expression (i.e. an expression which is the subject or complement of a verb or other predicate), the kind of movement operation illustrated by the dotted arrow in (5) is called A-movement.

Given the arguments presented in chapters 4 and 5 that Head Movement and Wh-Movement are composite operations involving copying and deletion, we would expect the same to be true of A-movement. One piece of evidence in support of a copying analysis of A-movement comes from scope.
properties in relation to sentences such as (6a) below, which will have the syntactic structure shown in simplified form in (6b) if everyone originates as the subject of the verb finished and is then raised up (by A-movement) to become the subject of the present tense auxiliary have:

(6)(a) Everyone hasn’t finished the assignment yet

(b) \[[CP [C ø] [TP Everyone [\_\_T has] [NegP not [Neg ø] [VP everyone [V finished] the assignment yet]]]]\]

For many speakers, sentences like (6a) are ambiguous between (i) a reading on which the quantifier expression everyone has scope over not so that the sentence means much the same as ‘Everyone is in the position of not having finished the assignment yet’, and (ii) another reading on which everyone falls within the scope of not (so that the sentence means much the same as ‘Not everyone has finished the assignment yet’). We can account for this scope ambiguity in a principled fashion if we suppose that A-movement involves copying, that scope is defined in terms of c-command (so that a scope-bearing constituent has scope over constituents which it c-commands), and that the scope of a universally quantified expression like everyone in negative structures like (6b) can be determined either in relation to the initial position of everyone or in relation to its final position. In (6b) everyone is initially merged in a position (marked by strikethrough) in which it is c-commanded by (and so falls within the scope of) not; but via A-movement it ends up in an (italicised) position in which it c-commands (and so has scope over) not. The scope ambiguity in (6a) therefore reflects the two different positions occupied by everyone in the course of the derivation. (See Lebeaux 1995, Hornstein 1995, Romero 1997, Sauerland 1998, Lasnik 1998/1999, Fox 2000, and Boeckx 2000, 2001 for discussion of scope in A-movement structures.)

The claim that (non-expletive) subjects like some students/lots of students in sentences like (1) originate internally within the VP containing the relevant verb (and from there move into spec-T in sentences like (1) above) is known in the relevant literature as the VP-Internal Subject Hypothesis (= VPISH), and has been widely adopted in research since the mid 1980s. An extensive body of evidence was adduced in support of the hypothesis from a variety of sources and languages in the 1980s and early 1990s, e.g. in Kitagawa (1986), Speas (1986), Contreras (1987), Zagona (1987), Kuroda (1988), Sportiche (1988), Rosen (1990), Ernst (1991), Koopman and Sportiche (1991), Woolford (1991), Burton and Grimshaw (1992), McNally (1992), Guilfoyle, Hung and Travis (1992), and Huang (1993). Since then, it has become a standard analysis. Below, we look at some of the evidence in support of VPISH.

6.3 Idioms

An interesting piece of evidence in support of the VP-Internal Subject Hypothesis comes from the syntax of idioms. We can define idioms as expressions (like those italicised below) which have an idiosyncratic meaning which is not a purely compositional function of the meaning of their individual parts:

(7)(a) Let’s have a couple of drinks to break the ice
(b) Be careful not to upset the applecart
(c) The president must bite the bullet

There seems to be a constraint that only a string of words which forms a unitary constituent can be an idiom. So, while we find idioms like those in (7) which are of the form verb+complement (but where the subject isn’t part of the idiom), we don’t find idioms of the form subject+verb where the verb has a complement which isn’t part of the idiom: this is because in subject+verb+complement structures, the verb and its complement form a unitary constituent (a V-bar), whereas the subject and the verb do not – and only unitary constituents can be idioms.

In the light of the constraint that an idiom is a unitary constituent with an idiosyncratic interpretation, consider idioms such as the following:

(8)(a) All hell broke loose (b) The shit hit the fan (c) The cat got his tongue

In (8), not only is the choice of verb and complement fixed, but so too is the choice of subject. In such idioms, we can’t replace the subject, verb or complement by near synonyms – as we see from the fact that sentences like (9) below are ungrammatical (on the intended idiomatic interpretation):
(9)(a) *The whole inferno escaped
(b) *Camel dung was sucked into the air conditioning
(c) *A furry feline bit his lingual articulator

However, what is puzzling about idioms like (8) is that one or more auxiliaries can freely be positioned between the subject and verb: cf.

(10)(a) All hell will break loose
(b) All hell has broken loose
(c) All hell could have broken loose

(11)(a) The shit might hit the fan
(b) The shit has hit the fan
(c) The shit must have hit the fan

How can we reconcile our earlier claim that only a string of words which form a unitary constituent can constitute an idiom with the fact that all hell...break loose is a discontinuous string in (10), since the subject all hell and the predicate break loose are separated by the intervening auxiliaries will/has/could have? To put the question another way: how can we account for the fact that although the choice of subject, verb and complement is fixed, the choice of auxiliary is not?

The VP-Internal Subject Hypothesis provides a straightforward answer, if we suppose that subjects originate internally within VP, and that clausal idioms like those in (8) are VP idioms which require a fixed choice of head, complement and specifier in the VP containing them. For instance, in the case of (8a), the relevant VP idiom requires the specific word break as its head verb, the specific adjective loose as its complement, and the specific quantifier phrase all hell as its subject/specifier. We can then account for the fact that all hell surfaces in front of the auxiliary will in (8a) by positing that the QP all hell originates in spec-V as the subject of break loose, and is then raised (via A-movement) into spec-T to become the subject of will break loose. Given these assumptions, (8a) will be derived as follows. The verb break merges with the adjective loose to form the idiomatic V-bar break loose. This is then merged with its QP subject all hell to form the idiomatic VP all hell break loose. The resulting VP is merged with the tense auxiliary will to form the T-bar will all hell break loose. The subject and predicate thereby come to be separated from each other – movement of the subject to spec-T being driven by an [EPP] feature carried by [t will] requiring will to have a subject with person/number features. Subsequently, the TP in (12) is merged with a null declarative complementiser, so deriving the structure associated with (10a) All hell will break loose.

(12)

We can then say that (in the relevant idiom) all hell must be the sister of break loose, and that this condition will be met only if all hell originates in spec-V as the subject (and sister) of the V-bar break loose. We can account for how the subject all hell comes to be separated from its predicate break loose by positing that subjects originate internally within VP and from there raise to spec-T (via A-movement) across an intervening T constituent like will, so that the subject and predicate thereby come to be separated from each other – movement of the subject to spec-T being driven by an [EPP] feature carried by [t will] requiring will to have a subject with person/number features. Subsequently, the TP in (12) is merged with a null declarative complementiser, so deriving the structure associated with (10a) All hell will break loose.

6.4 Argument Structure and theta roles

The assumption that subjects originate internally within VP ties up in interesting ways with traditional ideas from predicate logic, which maintains that propositions (which can be thought of as representing the substantive semantic content of clauses) comprise a predicate and a set of arguments. Simplifying somewhat, we can say that a predicate is an expression denoting an activity or event, and an argument is an expression denoting a participant in the relevant activity or event. For example, in sentences such as those below, the italicised verbs are predicates and the bracketed expressions represent
their arguments:

(13)(a) [The guests] have arrived
(b) [The police] have arrested [the suspect]

In other words, the arguments of a verb are typically its subject and complement(s). It has been widely assumed in work spanning more than half a century that complements of verbs are contained within a projection of the verb – e.g. the suspect in (13b) is the direct object complement of arrested and is contained within the verb phrase headed by arrested (so that arrested the suspect is a VP). Under the VP-Internal Subject Hypothesis, we can go further than this and make the following (more general) claim:

(14) **Predicate-Internal Argument Hypothesis**

All the arguments of a predicate originate within a projection of the predicate

Such an assumption allows us to maintain that there is a uniform mapping (i.e. relationship) between syntactic structure and semantic argument structure – more specifically, between the position in which arguments are initially merged in a syntactic structure and their semantic function.

To see what this means in practice, consider the derivation of (13b) *The police have arrested the suspect*. The verb *arrested* merges with its direct object complement *the suspect* (a DP formed by merging the determiner *the* with the noun *suspect*) to form the V-bar *arrested the suspect*. The resulting V-bar is in turn merged with the subject DP *the police* (formed by merging the determiner *the* with the noun *police*) to form the VP shown in (15) below (simplified by not showing the internal structure of the two DPs):

(15)

```
VP
  DP
  the police
V'
    V
    arrested
    DP
    the suspect
```

In a structure such as (15), the complement *the suspect* is said to be the **internal argument** of the verb *arrested* (in the sense that it is the argument contained within the immediate V-bar projection of the verb, and hence is a sister of the verb), whereas the subject *the police* is the **external argument** of the verb *arrested* (in that it occupies a position external to the V-bar constituent which is the immediate projection of the verb *arrested*). The VP in (15) is then merged with the present tense auxiliary [\(T\) have], forming the T-bar *have the police arrested the suspect*. Since a finite T has an [EPP] feature requiring it to have a subject of its own, the DP *the police* moves from being the subject of *arrested* to becoming the subject of [\(T\) have], forming *The police have the police arrested the suspect*. Merging the resulting TP with a null declarative complementiser in turn derives the structure shown in simplified form in (16) below:

(16)

```
CP
  \(\phi\)
  TP
    DP
    the police
    T'
      T
      have
      DP
      the police
      VP
        V'
        V
        arrested
        DP
        the suspect
```

Under the analysis in (16), the argument structure of the verb *arrest* is directly reflected in the internal structure of the VP which it heads, since *the suspect* is the internal (direct object) argument of *arrested* and *the police* was initially merged as its external (subject) argument – and indeed a null copy of *the police* is left behind in spec-VP, marking the spec-V position as associated with *the police*.

However, there is an important sense in which it is not enough simply to say that in a sentence such as (13b) *The police have arrested the suspect* the verb *arrest* is a predicate which has two arguments – the
internal argument *the suspect* and the external argument *the police*. After all, such a description fails to account for the fact that these two arguments play very different semantic roles in relation to the act of *arrest* – i.e. it fails to account for the fact that *the police* are the individuals who perform the act (and hence get to verbally and physically abuse the suspect), and that *the suspect* is the person who suffers the consequences of the act (e.g. being manhandled, handcuffed, thrown into the back of a windowless vehicle and beaten up). Hence, any adequate account of argument structure should provide a description of the semantic role which each argument plays.

In research spanning half a century – beginning with the pioneering work of Gruber (1965), Fillmore (1968), and Jackendoff (1972) – linguists have attempted to devise a universal typology of the semantic roles played by arguments in relation to their predicates. In the table in (17) below are listed a number of terms used to describe some of these roles (the convention being that terms denoting semantic roles are CAPITALISED), and for each role an informal gloss is given, together with an illustrative example in parentheses (in which the italicised expression has the semantic role specified):

(17) **List of roles played by arguments with respect to their predicates**

<table>
<thead>
<tr>
<th>Role</th>
<th>Gloss</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>THEME</td>
<td>Entity undergoing the effect of some action</td>
<td><em>Mary</em> fell over</td>
</tr>
<tr>
<td>AGENT</td>
<td>Entity instigating some action</td>
<td><em>Debbie</em> killed <em>Harry</em></td>
</tr>
<tr>
<td>EXPERIENCER</td>
<td>Entity experiencing some psychological state</td>
<td><em>I</em> like syntax</td>
</tr>
<tr>
<td>LOCATIVE</td>
<td>Place in which something is situated or takes place</td>
<td><em>He</em> hid it <em>under the bed</em></td>
</tr>
<tr>
<td>GOAL</td>
<td>Entity representing the destination of some other entity</td>
<td><em>John</em> went <em>home</em></td>
</tr>
<tr>
<td>SOURCE</td>
<td>Entity from which something moves</td>
<td><em>He</em> returned <em>from Paris</em></td>
</tr>
<tr>
<td>INSTRUMENT</td>
<td>Means used to perform some action</td>
<td><em>He</em> hit it <em>with a hammer</em></td>
</tr>
</tbody>
</table>

We can illustrate how the terminology in (17) can be used to describe the semantic roles played by arguments in terms of the following examples:

(18)(a) [The FBI] arrested [Larry Luckless] [AGENT] [THEME]
(b) [The suspect] received [a caution] [GOAL] [THEME]
(c) [The audience] enjoyed [the play] [EXPERIENCER] [THEME]
(d) [The president] went [to Boston] [THEME] [GOAL]
(e) [They] stayed [in a hotel] [THEME] [LOCATIVE]
(f) [The noise] came [from the house] [THEME] [SOURCE]

Given that – as we see from these examples – the **THEME** role is a central one, it has become customary over the past two decades to refer to the relevant semantic roles as thematic roles: and since the Greek letter \( \theta \) (= *theta*) corresponds to *th* in English and the word *thematic* begins with *th*, it has become standard practice to also use the synonymous expression theta-role or \( \theta \)-role (pronounced *thetarole* by some and *thaytarole* by others). Using this terminology, we can say (e.g.) that in (18a) *the FBI* is the **AGENT** argument of the predicate *arrested*, and that *Larry Luckless* is the **THEME** argument of *arrested*.

Thematic relations (like **AGENT** and **THEME**) have been argued to play a central role in the description of a range of linguistic phenomena. For example, it has been claimed that the distribution of certain types of adverb is thematically determined. Thus, Gruber (1976) maintains that adverbs like *deliberately* can only be associated with **AGENT** arguments: cf.

(19)(a) *John (= AGENT) deliberately* rolled the ball down the hill
(b) *The ball (= THEME) deliberately* rolled down the hill

Likewise, Fillmore (1972, p.10) argues that the adverb *personally* can only be associated with **EXPERIENCER** arguments:

(20)(a) *Personally, I (= EXPERIENCER) don’t like roses*
(b) *Personally, your proposal doesn’t interest me (= EXPERIENCER)*
(c) *Personally, I (= AGENT) hit you*
(d) *Personally, you hit me (= THEME)*

In a similar vein, Fillmore (1968, p.10) argues that only constituents with the same thematic function can be co-ordinated: cf.
(21)(a) John (= AGENT) broke the window
(b) A hammer (= INSTRUMENT) broke the window
(c) ??John (= AGENT) and a hammer (= INSTRUMENT) broke the window

And Jackendoff (1972) argues at length that a number of constraints on passive structures can be accounted for in thematic terms. For example, he argues (1972, p.44) that the ill-formedness of passive sentences like:

(22)(a) *Five dollars are cost by this book
(b) *Two hundred pounds are weighted by Bill

is attributable to violation of the following condition (formulated in thematic terms):

(23) **Passive Thematic Hierarchy Condition**

The passive by-phrase must be higher on the Thematic Hierarchy than the superficial subject

The hierarchy referred to in (23) is that in (24) below:

(24) **Thematic Hierarchy**

AGENT > LOCATIVE/SOURCE/GOAL > THEME

Jackendoff maintains that the by-phrase in both examples in (22) is a THEME argument of the relevant verb, whereas the superficial subject is a LOCATIVE argument. Since THEME is lower on the hierarchy (24) than LOCATIVE, sentences like (22) violate the condition (23) and so are ungrammatical.

If we look closely at the examples in (18), we see a fairly obvious pattern emerging. Each of the bracketed argument expressions in (18) carries one and only one $\theta$-role, and no two arguments of any predicate carry the same $\theta$-role. Chomsky (1981) suggested that these thematic properties of arguments are the consequence of a principle of Universal Grammar traditionally referred to as the **$\theta$-criterion**, and outlined in (25) below:

(25) **Theta Criterion/$\theta$-criterion**

Each argument bears one and only one $\theta$-role, and each $\theta$-role is assigned to one and only one argument

(Chomsky 1981, p.36)

A principle along the lines of (25) has been assumed (in some form or other) in much subsequent work.

However, a question which arises from (25) is how $\theta$-roles are assigned to arguments. It seems clear that in V-bar constituents of the form *verb+complement*, the thematic role of the complement is determined by the semantic properties of the verb. As examples like (18a, b, c) illustrate, the $\theta$-role associated with complements is often that of THEME (though this is not always the case – e.g. the complement *me* of the verb *bother* in *Personally, it doesn’t bother me* has the thematic role of EXPERIENCER). However, the question of how subjects are assigned theta-roles is more complex.

Marantz (1984, pp. 23ff.) and Chomsky (1986a, pp.59-60) argue that although verbs directly assign theta-roles to their internal arguments (i.e. complements), it is not the verb but rather the whole verb+complement (i.e. V-bar) expression which determines the theta-role assigned to its external argument. The evidence they adduce in support of this conclusion comes from sentences such as:

(26)(a) John threw a ball                (b) John threw a fit
(27)(a) John broke the window           (b) John broke his arm

Although the subject of the verb *threw* in both (26a) and (26b), *John* plays a different thematic role in the two sentences – that of AGENT in the case of *threw a ball*, but that of EXPERIENCER in *threw a fit*. Likewise, although the subject of the verb *broke* in both (27a) and (27b), *John* plays the role of AGENT in (27a) but that of EXPERIENCER on the most natural (accidental arm-breaking) interpretation of (27b). From examples such as these, Marantz and Chomsky conclude that the thematic role of the subject is not determined by the verb alone, but rather is compositionally determined by the whole verb+complement structure – i.e. by V-bar. On this view, a verb assigns a $\theta$-role directly to its internal argument, but only indirectly (as a compositional function of the semantic properties of the overall V-bar) to its external argument. To use the relevant technical terminology, we can say that predicates *directly $\theta$-mark* their complements, but *indirectly $\theta$-mark* their subjects/specifiers.

A related observation is that auxiliaries seem to play no part in determining the assignment of
theta-roles to subjects. For example, in sentences such as:

(28)(a) He will throw the ball/a fit  
(b) He was throwing the ball/a fit  
(c) He had been throwing the ball/a fit  
(d) He might have been throwing the ball/a fit

the thematic role of the subject he is determined purely by the choice of V-bar constituent (i.e. whether it is throw the ball or throw a fit), and is not affected in any way by the choice of auxiliary. Clearly, any theory of θ-marking should offer us a principled answer to questions such as the following: How are θ-roles assigned? Why do some constituents (e.g. verbs) play a key role in θ-marking, while others (e.g. auxiliaries) do not?

We can provide a principled answer to these questions in the following terms. Let us assume that θ-roles are assigned to arguments via merger with a predicative expression (i.e. an expression headed by an item which functions as a predicate – e.g. a verb). In the light of this observation, consider our earlier sentence (13b) The police have arrested the suspect. Since the verb arrested is a predicate which has a THEME complement, the complement the suspect will be assigned the θ-role of THEME argument of arrested when the verb merges with its complement. Since arrest is a predicate which (in addition to requiring a THEME complement) also requires an AGENT external argument, the subject the police will be assigned the θ-role of AGENT argument of arrest when it merges with the V-bar arrested the suspect. The resulting VP the police arrested the suspect is then merged with the auxiliary have to form the T-bar have the police arrested the suspect. Because a finite T has an [EPP] feature requiring it to have a specifier, the subject the police raises to spec-T, deriving The police have the police arrested the suspect. However, the subject the police does not receive any theta-role from the auxiliary have, since auxiliaries are not predicates (unlike main verbs) and hence do not theta-mark their subjects. The resulting TP is ultimately merged with a null declarative complementiser to derive the structure associated with (13b) The police have arrested the suspect.

Our discussion here suggests that thematic considerations lend further support to the VP-Internal Subject Hypothesis. By positing that subjects originate internally within VP, we can arrive at a unitary and principled account of θ-marking in terms of sisterhood, in that an argument is θ-marked by a predicative expression which is its sister: e.g. the verb arrested in (16) θ-marks its sister argument (complement) the suspect, and the V-bar arrested the suspect θ-marks its sister (subject) argument the police.

6.5 Unaccusative predicates

The overall conclusion to be drawn from our discussion so far is that subjects originate internally within VP, as theta-marked arguments of the verb. In all the structures we have looked at until now, the verb phrase has contained both a complement and a specifier (the specifier being the subject of the verb). However, in this and subsequent sections we look at VPs which contain a verb and a complement but no specifier, and where it is the complement of the verb which subsequently moves to spec-T.

One such type of VP are those headed by a special subclass of intransitive verbs which are known as unaccusative predicates for reasons which will become apparent shortly. In this connection, consider the syntax of the italicised arguments in structures such as the following:

(29)(a) There have arisen several complications  
(b) There could have occurred a diplomatic incident  
(c) There remains little hope of finding survivors

The fact that the italicised expressions are positioned after the bold-printed verbs suggests that they function as the complements of the relevant verbs – and indeed there is syntactic evidence in support of this view. Part of the evidence comes from their behaviour in relation to a constraint on movement operations discovered by Huang (1982) which can be characterised informally in the following terms:

(30) Constraint on Extraction Domains/CED

Only complements allow material to be extracted out of them, not specifiers or adjuncts.

We can illustrate Huang’s CED constraint in terms of the following contrasts:
(31a) He was taking [pictures of who]?
(b) Who was he taking [pictures of who]?

(32a) [Part of what] has broken?
(b) *What has [part of what] broken?

(33a) He was angry [when she hid what]?
(b) *What was he angry [when she hid what]?

(31a, 32a, 33a) are echo questions in which the wh-pronoun who/what remains in situ, while (31b, 32b, 33b) are their wh-movement counterparts. In (31b), who is extracted out of a bracketed nominal expression which is the complement of the verb taking, and yields a grammatical outcome because there is no violation of CED (extraction out of complement expressions being permitted by CED). By contrast, in (32b) what is extracted out of a bracketed expression which is the subject (and hence specifier) of the auxiliary has, and since CED blocks extraction out of specifiers, the resulting sentence is ungrammatical. Likewise in (33b) what is extracted out of a bracketed adjunct clause, and since CED blocks extraction out of adjuncts, the sentence is ungrammatical. (See Nunes and Uriagereka 2000, Sabel 2002 and Chomsky 2005b for attempts to devise a Minimalist account of CED effects.)

In the light of Huang’s CED constraint, consider a sentence such as:

(34) How many survivors does there remain [some hope of finding how many survivors]

Here, the wh-phrase how many survivors has been extracted (via wh-movement) out of the bracketed expression some hope of finding how many survivors. Given that the Condition on Extraction Domains tells us that only complements allow material to be extracted out of them, it follows that the bracketed expression in (34) must be the complement of the verb remain. By extension, we can assume that the italicised expressions in (29) are likewise the complements of the bold-printed verbs.

A further argument supporting the claim that unaccusative subjects are initially merged as complements comes from observations about quantifier stranding in the West Ulster variety of English. McCloskey (2000) notes that West Ulster English allows wh-questions such as (35) below which have the interpretation ‘What are all the things that you got for Christmas?:

(35)(a) What all did you get for Christmas?  (b) What did you get all for Christmas?

He argues that when the universal quantifier all is used to modify a wh-word like what, wh-movement can either move the whole expression what all to the front of the sentence (as in 35a), or can move the word what on its own, thereby stranding the quantifier in situ (as in 35b). In the light of his observation, consider the following sentence:

(36) What happened all at the party last night?

The fact that the quantifier all is stranded in a position following the unaccusative verb happened suggests that the wh-expression what all originates in postverbal position as the complement of the verb happened. More generally, sentences like (36) provide empirical evidence in support of positing that unaccusative subjects are initially merged as complements.

However, the unaccusative complements italicised in structures like (29) differ in an important respect from the complements of typical transitive verbs. A typical transitive verb has a thematic subject and a thematic complement, and assigns accusative case to its complement (as in She hit him, where hit has the nominative AGENT subject she and the accusative THEME complement him). Unlike transitive structures, unaccusative structures like (29) have a non-thematic there subject (which is non-thematic in the sense that it isn’t a theta-marked argument of the verb, but rather is a pure expletive), and (in languages which have a richer case system than English) the italicised complement receives nominative (= NOM) case, as the following Icelandic example (which Matthew Whelpton kindly asked Johannes Gisli Jónsson to provide for me) illustrates:

(37) Þad hafa kominð nokkrirNOM gestirNOM
There have come some guests

Because they don’t assign accusative case to their complements, such verbs are known as unaccusative predicates.

Not all intransitive verbs allow their arguments to be positioned after them, however – as we see from the ungrammaticality of sentences such as (38) below:

(38) ...
Intransitive verbs like *complain*/*groan*/*salute* are known as **unergative verbs**: they differ from
unaccusatives in that the subject of an unergative verb has the thematic role of an AGENT argument,
whereas the subject of an unaccusative verb has the thematic property of being a THEME argument.

In addition to the contrast illustrated in (29/38) above, there are a number of other important syntactic
differences between unaccusative verbs and other types of verb (e.g. unergative verbs or transitive verbs).
For example, Alison Henry (1995) notes that in one dialect of Belfast English (which she calls dialect A)
unaccusative verbs can have (italicised) postverbal subjects in imperative structures like:

(39)(a) Leave you now!  (b) Arrive you before 6 o’clock!
(c) Be going you out of the door when he arrives!

By contrast, other (e.g. unergative or transitive) verbs don’t allow postverbal imperative subjects, so that
imperatives such as (40) below are ungrammatical in the relevant dialect:

(40)(a) *Read you that book!  (b) *Eat you up!  (c) *Always laugh you at his jokes!

Additional evidence for positing that unaccusative verbs are syntactically distinct from other verbs comes
from **auxiliary selection** facts in relation to earlier stages of English when there were two perfect aspect
auxiliaries (*have* and *be*), each taking a complement headed by a specific kind of verb. Unaccusative verbs
differed from transitive or unergative verbs in being used with the perfect auxiliary *be*, as the sentences in
(41) below (taken from various plays by Shakespeare) illustrate:

(41)(a) Mistress Page *is come* with me (Mrs Ford, *Merry Wives of Windsor*, V.ii)
(b) *Is the duke gone? Then is your cause gone* too (Duke, *Measure for Measure*, V.iii)
(c) How chance thou *art returned* so soon? (Antipholus, *Comedy of Errors*, Lii)
(d) *She is fallen* into a pit of ink (Leonato, *Much Ado About Nothing*, IV.iii)

We find a similar contrast with the counterparts of perfect HAVE/BE in a number of other languages – e.g.
and Danish (cf. Spencer 1991): see Sorace (2000) for further discussion. A last vestige of structures like
(41) survives in present-day English sentences such as *All hope of finding survivors is now gone*.

A further difference between unaccusative predicates and others relates to the adjectival use of their
perfect participle forms. As the examples below indicate, perfect participle (-n/-d) forms of unaccusative
verbs can be used adjectivally (to modify a noun), e.g. in sentences such as:

(42)(a) The train *arrived* at platform 4 is the delayed 8.28 for London Euston
(b) The vice squad arrested a businessman recently *returned* from Thailand
(c) Several facts recently *come* to light point to his guilt
(d) Brigadier Bungle is something of a *fallen* hero

By contrast, perfect participle forms of (active) transitive verbs or unergative verbs cannot be used in the
same way, as we see from the ungrammaticality of examples like (43) below:

(43)(a) *The man committed* suicide was a neighbour of mine
(b) *The thief stolen* the jewels was never captured
(c) *The man overdosed* was Joe Doe
(d) *The yawned* student eventually fell asleep in class

In this respect, unaccusative verbs resemble passive participles, which can also be used adjectivally (cf. a
*changed man*, a *battered wife*, a *woman arrested for shoplifting*, etc.). Additional syntactic differences
between unaccusative verbs and others have been reported for other languages (see e.g. Burzio 1986 on ne
cliticization in Italian, and Contreras 1986 on bare nominals in Spanish).

We thus have a considerable body of empirical evidence that unaccusative subjects behave differently
from subjects of other (e.g. unergative or transitive) verbs. Why should this be? The answer given in work
dating back to Burzio (1986) is that the subjects of unaccusative verbs do not originate as the subjects of
their associated verbs at all, but rather as their complements, and that unaccusative structures with
postverbal arguments involve leaving the relevant argument in situ in VP-complement position – e.g. in
unaccusative expletive structures such as (29) above, and in Belfast English unaccusative imperatives such as (39). This being so, a sentence such as (29a) *There have arisen several complications* will be derived as follows. The quantifier *several* merges with the noun *complications* to form the QP *several complications*. This is merged as the complement of the unaccusative verb *arisen*, forming the VP *arisen several complications*. The resulting VP is merged with the auxiliary *have* to form the T-bar shown in simplified form below:

(44)

```
T
   
V  QP
arisen several complications
```

The [EPP] feature carried by the finite T constituent *have* requires it to have a nominal (i.e. noun or pronoun) expression as its specifier. This requirement is satisfied by merging expletive *there* in spec-T. The resulting TP *there have arisen several complications* is then merged with a null declarative-force complementiser to form the CP (45) below:

(45)

```
C
   
PRN
there
   
T
   
V  QP
arisen several complications
```

And (45) is the structure of (29a) *There have arisen several complications*.

However, an alternative way for the T constituent in (44) to satisfy the [EPP] requirement to have a nominal specifier is for T to attract a nominal to move to spec-T. In accordance with the Attract Closest Principle, T will attract the closest nominal within the structure containing it. Since the only nominal in (44) is the QP *several complications*, T therefore attracts this QP to move to spec-T in the manner shown in simplified form in (46) below:

(46)

```
TP
   
QP

T
   
V  QP
arisen several complications
```

The type of movement involved is the familiar A-movement operation which moves an argument from a position lower down in a sentence to become the structural subject (and specifier) of TP. The resulting TP in (46) is subsequently merged with a null complementiser marking the declarative force of the sentence, so generating the structure associated with *Several complications have arisen*.

The A-movement analysis of unaccusative subjects in (46) above allows us to provide an interesting account of sentences pairs like that in (47) below:

(47)(a) All hope of finding survivors has gone
(b) All hope has gone of finding survivors
Since GO is an unaccusative verb, the QP *all hope of finding survivors* will originate as the complement of *gone*. Merging *gone* with this QP will derive the VP *gone all hope of finding survivors*. The resulting VP is merged with the T constituent *has* to form the T-bar *has gone all hope of finding survivors*. Since T has an [EPP] feature requiring it to project a specifier, the QP *all hope of finding survivors* is raised to spec-T, leaving an italicised copy behind in the position in which it originated. Merging the resulting TP with a null complementiser marking the declarative force of the sentence derives the structure shown in simplified form in (48) below:

(48) [CP [C ø] [TP [QP All hope of finding survivors] [T has] [VP [V gone] [QP all hope of finding survivors]]]]

In the case of (47a), the whole of the QP *all hope of finding survivors* is spelled out in the bold-printed spec-T position which it moves to, and the italicised copy of the moved QP in VP-complement position is deleted in its entirety – as shown in simplified form in (49) below:

(49) [CP [C ø] [TP [QP All hope of finding survivors] [T has] [VP [V gone] [QP all hope of finding survivors]]]]

In the case of (47b), the quantifier *all* and the noun *hope* are spelled out in the bold-printed position they move to in (48), and the PP *of finding survivors* is spelled out in the VP-complement position in which it originates – as shown in simplified form in (50) below:

(50) [CP [C ø] [TP [QP All hope of finding survivors] [T has] [VP [V gone] [QP all hope of finding survivors]]]]

(50) thus presents us with another example of the discontinuous/split spellout phenomenon highlighted in §5.3. It also provides evidence in support of taking A-movement (like other movement operations) to be a composite operation involving copying and deletion.

### 6.6 Passive predicates

A class of predicates which are similar in some respects to unaccusative predicates are passive predicates. Traditional grammarians maintain that the bold-printed verbs in sentences such as the (a) examples in (51-53) below are in the active voice, whereas the italicised verbs in the corresponding (b) sentences are in the passive voice (and have the status of passive participles):

(51)(a) Hundreds of passers-by saw the attack
      (b) The attack was seen by hundreds of passers-by
(52)(a) Lex Luthor stole the kryptonite
      (b) The kryptonite was stolen by Lex Luthor
(53)(a) They took everything
      (b) Everything was taken

There are four main properties which differentiate passive sentences from their active counterparts. One is that passive (though not active) sentences generally require the auxiliary BE. Another is that the main verb in passive sentences is in the passive participle form (cf. *seen/stolen/taken*), which is generally homophonous with the perfect participle form. A third is that passive sentences may (though need not) contain a by-phrase in which the complement of by plays the same thematic role as the subject in the corresponding active sentence: for example, *hundreds of passers-by* in the active structure (51a) serves as the subject of *saw the attack*, whereas in the passive structure (51b) it serves as the complement of the preposition *by* (though in both cases it has the thematic role of EXPERIENCER argument of *see*). The fourth difference is that the expression which serves as the complement of an active verb surfaces as the subject in the corresponding passive construction: for example, *the attack* is the complement of *saw* in the active structure (51a), but is the subject of *was* in the passive structure (51b). Since this chapter is concerned with A-movement (and hence the syntax of subjects), we focus on the syntax of the superficial subjects of passive sentences (setting aside the derivation of by-phrases).

Passive predicates resemble unaccusatives in that alongside structures like those in (54a-56a) below containing preverbal subjects they also allow expletive structures like (54b-56b) in which the italicised argument can be postverbal (providing it is an indefinite expression):

(54)(a) No evidence of any corruption was found
      (a) There was found no evidence of any corruption
(55)(a) Several cases of syntactophobia have been reported
      (b) There have been reported several cases of syntactophobia
(56)(a) A significant change of policy has been announced
(b) There has been announced a significant change of policy

How can we account for the dual position of the italicised expression in such structures?

The answer given within the framework outlined here is that a passive subject is initially merged as the thematic complement of the main verb (i.e. it originates as the complement of the main verb as in (54b-56b) and so receives the θ-role which the relevant verb assigns to its complement), and subsequently moves from V-complement position into T-specifier position in passive sentences such as (54a-56a).

On this view, the derivation of sentences like (54) will proceed as follows. The noun corruption merges with the quantifier any to form the QP any corruption. The resulting QP then merges with the preposition of to form the PP of any corruption. This PP in turn merges with the noun evidence to form the NP evidence of any corruption. The resulting NP is merged with the negative quantifier no to form the QP no evidence of any corruption. This QP is merged as the complement of the passive verb found (and thereby assigned the thematic role of THEME argument of found) to form the VP found no evidence of any corruption. The VP thus formed is merged with the auxiliary was forming the T-bar was found no evidence of any corruption. The auxiliary [T was] carries an [EPP] feature requiring it to have a specifier. This requirement can be satisfied by merging the expletive pronoun there in spec-T, deriving the TP There was found no evidence of any corruption. Merging this TP with a null complementiser marking the declarative force of the sentence will derive the structure shown in simplified form in (57) below:

![Diagram of (57)](image)

However, an alternative way of satisfying the [EPP] feature of T is not to merge there in spec-T, but rather to passivise the QP no evidence of any corruption – i.e. to move it from being the thematic object of found to becoming the structural subject of was. Merging the resulting TP with a null complementiser which marks the sentence as declarative in force derives the CP shown in simplified form in (58) below (with the dotted arrow showing the movement which took place on the T-cycle):

![Diagram of (58)](image)

The arrowed movement operation (traditionally called passivisation) by which QP moves from thematic complement position into structural subject position turns out to be a particular instance of the more general A-movement operation which serves to create structural subjects (i.e. to move arguments into spec-T in order to satisfy the [EPP] feature of T). Note that an assumption implicit in the analyses in (57) and (58) is that verb phrases headed by intransitive passive participles remain subjectless throughout the derivation, because the T constituent was is the head which requires a structural subject by virtue of its [EPP] feature, not the verb found (suggesting that it is functional heads like T and C which trigger movement, not lexical heads like V).
In the case of (54a) *No evidence of any corruption was found*, the whole of the QP *no evidence of any corruption* is spelled out in the bold-printed spec-TP position in (58) at the head of the movement chain, and all the material in the italicised V-complement position at the foot of the movement chain is deleted. However, in §5.3 we saw that some structures in which a moved noun has a prepositional complement may allow discontinuous spellout, with the noun and any preceding expressions modifying it being spelled out at the head (i.e. on the highest link) of the movement chain, and its prepositional or clausal complement being spelled out at the foot (i.e. on the lowest link) of the movement chain. Discontinuous spellout is also permitted in (58), allowing for the possibility of the quantifier *no* and the noun *evidence* being spelled out in the bold-printed position at the head (i.e. top) of the movement chain, and the PP of *any corruption* being spelled out in the italicised VP-complement position at the foot (i.e. bottom) of the movement chain, so deriving the structure associated with the sentence in (59) below:

(59) **No evidence** was found of any corruption

Sentences such as (59) thus provide us with empirical evidence that passive subjects originate as complements, on the assumption that *of any corruption* is a remnant of the preposed complement *no evidence of any corruption*.

Further evidence that passive subjects originate as complements comes from the distribution of idiomatic nominals like those italicised below:

(60)(a) They **paid little heed** to what he said  
(b) **Little heed** was **paid** to what he said

(61)(a) They **paid due homage** to General Ghouly  
(b) **Due homage** was **paid** to General Ghouly

(62)(a) The FBI **kept close tabs** on the CIA  
(b) **Close tabs** were **kept** on the CIA by the FBI

In expressions such as *pay heed/homage to* and *keep tabs on*, the verb *pay/keep* and the noun expression containing *heed/homage to* and *tabs* form an idiom. Given the arguments in §6.3 that idioms are unitary constituents, it is apparent that the bold-printed verb and the italicised noun expression must form a unitary constituent when they are first introduced into the derivation. This will clearly be the case if we suppose that the noun expression originates as the complement of the associated verb (as in 60a-62a), and becomes the subject of the passive auxiliary was/were in (60b-62b) via passivisation/A-movement.

Additional evidence that passive subjects are initially merged as complements comes from quantifier stranding in West Ulster English structures such as the following (from McCloskey 2000, p.72):

(63) **What** was said **all** at the meeting?

Recall from our earlier discussion of sentences like (35) that McCloskey argues that stranded quantifiers modifying wh-expressions are left behind via movement of the wh-expression without the quantifier. This being so, sentences such as (63) provide evidence that *what all* originates as the complement of the passive participle *said* (with *what* subsequently being passivised on its own, stranding *all*) – and more generally, that passive subjects are initially merged as thematic objects.

A claim which is implicit in the hypothesis that passive subjects originate as thematic objects is that the subjects of active verbs and the complements of passive verbs have the same thematic function. Evidence that this is indeed the case comes from the traditional observation that the two are subject to the same pragmatic restrictions on the choice of expression which can occupy the relevant position, as we see from sentences such as the following (where ?, ?! and ! mark increasing degrees of anomaly):

(64)(a) *The students/?the camels/?The flowers/?The ideas* were arrested

(b) They arrested *the students/?the camels/?the flowers/?the ideas*

We can account for this if we suppose that pragmatic restrictions on the choice of admissible arguments for a given predicate depend jointly on the semantic properties of the predicate and the thematic role of the argument: it will then follow that two expressions which fulfil the same thematic role in respect of a given predicate will be subject to the same pragmatic restrictions on argument choice. Since passive subjects like those italicised in (64a) originate as complements, they will have the same θ-role (and so be subject to the same pragmatic restrictions on argument choice) as active complements like those italicised in (64b).

We can arrive at the same conclusion (that passive subjects originate as thematic complements) on theoretical grounds. It seems reasonable to suppose that principles of UG correlate thematic structure with syntactic structure in a uniform fashion: this assumption is embodied in the **Uniform Theta Assignment**
Hypothesis/UTAH argued for at length in Baker (1988). Given UTAH, it follows that two arguments which fulfil the same thematic function with respect to a given predicate will occupy the same initial position in the syntax. Hence if passive subjects have the same theta-role as active objects, it is plausible to suppose that passive subjects originate in the same V-complement position as active objects.

6.7 Long-distance passivisation

Thus far, the instances of passivization which we have looked at have been clause-internal in the sense that they have involved movement from complement to subject position within the same clause. However, passivisation can also apply across certain types of clause boundary – as can be illustrated in relation to structures such as (65) and (66) below:

(65)(a) There are alleged to have been stolen a number of portraits of the queen
   (b) A number of portraits of the queen are alleged to have been stolen

(66)(a) There are believed to have occurred several riots
   (b) Several riots are believed to have occurred

It seems clear that the italicised expression in each case is the thematic complement of the bold-printed verb in the infinitive clause, so that a number of portraits of the queen is the thematic complement of the passive verb stolen in (65), and several riots is the thematic complement of the unaccusative verb occurred in (66). In (65a, 66a), the italicised argument remains in situ as the complement of the bold-printed verb; but in (65b, 66b) the italicised argument moves to become the structural subject of the auxiliary are. Let’s look rather more closely at the derivation of sentences like (66a) and (66b).

(66a) is derived as follows. The quantifier several merges with the noun riots to form the QP several riots. This QP merges with (and is assigned the θ-role of THEME argument of) the unaccusative verb occurred to form the VP occurred several riots. The resulting VP merges with the perfect auxiliary have to form the AUXP have occurred several riots. This in turn merges with the infinitival tense particle to, so forming the T-bar to have occurred several riots. As we saw in section 3.2, infinitival to (like all T-constituents) has an [EPP] feature which requires it to have a noun or pronoun expression as its subject/specifier. One way of satisfying this requirement is for expletive there to be merged in spec-T, forming the TP there to have occurred several riots. The resulting TP then merges with the passive verb believed to form the VP believed there to have occurred several riots. This VP then merges with the present-tense T-auxiliary are to form the T-bar are believed there to have occurred several riots. A T-constituent like are has an [EPP] feature requiring it to have a suitable subject of its own, and one way of satisfying this requirement is for T to attract a (pro)noun expression which it c-commands to become its subject, with the Attract Closest Principle requiring T to attract the closest such expression. Accordingly, the T-auxiliary are attracts the expletive pronoun there to become its subject (via passivisation), so forming the TP there are believed there to have occurred several riots. This TP is then merged with a null C marking the sentence as declarative in force, so deriving the following structure:
And (67) is the structure of (66a) There are believed to have occurred several riots.

Now consider the derivation of (66b) Several riots are believed to have occurred. Assume that the derivation proceeds as for (66a) until we reach the stage where we have formed the T-bar to have occurred several riots. But this time, suppose that the EPP requirement that the infinitival T-constituent to should have a subject of its own is satisfied by moving the QP several riots to spec-T to become the subject of to, so forming the TP several riots to have occurred several riots. The resulting TP merges with the passive verb believed to form the VP believed several riots to have occurred several riots. This then merges with the present-tense T-auxiliary are to form the T-bar are believed several riots to have occurred several riots. Since the T-constituent are has an [EPP] feature, it can attract the closest noun or pronoun expression (= the QP several riots) to become its subject/specifier, so forming the TP several riots are believed several riots to have occurred several riots. The resulting TP is then merged with a null C constituent marking the sentence as declarative in force, so forming the CP shown below:

Our discussion illustrates that (in consequence of the EPP feature on T), long-distance passivisation takes place in a series of short steps (i.e. in a successive-cyclic fashion), moving the relevant expression one TP at a time. Its successive-cyclic (one-TP-at-a-time) application ensures that long-distance passivization
obeys UG locality principles such as Chomsky’s (1973) Subjacency Condition (barring movement out of more than one containing TP in any single movement operation), or Rizzi’s (1990) Relativized Minimality Condition (requiring a passivized constituent to move to become the specifier of the closest TP above it). Since operations which move a noun or pronoun expression into spec-T are instances of A-movement, long-distance passivisation involves a series of applications of the familiar A-movement operation: thus, each of the two arrowed movements in (68) is a particular instance of A-movement.

A key assumption made in (67) and (68) is that the to-infinitive complement of the verb believed is a TP and not a CP. This is in line with our assumption in §3.8 that believe is an ECM verb when used with an infinitival complement, and that its complement is a defective clause (lacking the CP layer found in canonical clauses) and hence a TP. Recall that we have independent evidence from contrasts such as:

(69)(a) Nobody intended [you to get hurt]  
(b) You weren’t intended [to get hurt]

(70)(a) Nobody intended [for you to get hurt]  
(b) *You weren’t intended [for to get hurt]

that an italicised expression contained within a TP complement like that bracketed in (69) can passivise, but not one contained within a CP complement like that bracketed in (70). Hence, the fact that several riots can passivise in (68) suggests that the to-infinitive complement of believed must be a TP, not a CP.

It is traditionally said that passivisation is an operation by which the complement of a VP becomes the subject/specifier of a higher TP. However, while this is true of the kind of passive structures which we have looked at so far, it is not true of those like (71) below:

(71)(a) All hell was said to have broken loose  
(b) The shit is expected to hit the fan

In (71a, b) the italicised passivised nominal is an idiomatic expression which originates as the subject of the bold-printed expression – demonstrating that passivisation can target subjects as well as complements. The derivation of (71b) proceeds as follows. The verb hit merges with the DP the fan to form the V-bar hit the fan. This V-bar in turn merges with the DP the shit to form the (idiomatic) VP the shit hit the fan. This VP is merged with the infinitival T-constituent to, forming the T-bar to the shit hit the fan. In conformity with the Attract Closest Principle, the [EPP] feature on T to enables it to attract the closest noun expression (= the shit) to become its subject, so forming the TP the shit to the shit hit the fan. The resulting TP is merged as the complement of the passive verb expected, forming the VP expected the shit to the shit hit the fan. This VP is then merged as the complement of the present-tense T-auxiliary is, forming the T-bar is expected the shit to the shit hit the fan. In accordance with the Attract Closest Principle, the [EPP] feature on the T-auxiliary is enables it to attract the closest nominal (= the shit) to become its subject, so forming the TP The shit is expected the shit to the shit hit the fan. Merging this TP with a null complementiser marking the sentence as declarative in force derives the structure below (with arrows showing the two movement operations which take place in the course of the derivation):
Although structures like (72) are traditionally said to involve long-distance passivisation, in actual fact they involve two separate local A-movement operations by which the idiomatic nominal the shit moves first to become the specifier of the lower TP (thereby becoming the subject of infinitival to) and then to become the specifier of the higher TP (thereby becoming the subject of is). In each case (in conformity with the Attract Closest Principle) T attracts the closest nominal expression which it c-commands to move to spec-TP, and the relevant movement operation satisfies the Subjacency Condition (which bars movement out of more than one containing TP in any single movement operation).

### 6.8 Raising

A further type of structure which involves movement of an argument expression out of one clause to become the subject of another clause is illustrated by the (b) examples in (78-81) below:

(73)(a) There does seem [to remain some hope of peace]

(b) Some hope of peace does seem [to remain]

(74)(a) There does appear [to have been made remarkably little progress on disarmament]

(b) Remarkably little progress on disarmament does appear [to have been made]

(75)(a) It would seem [that Senator Slyme has been lying to Congress]

(b) Senator Slyme would seem [to have been lying to Congress]

(76)(a) It would appear [that they have underestimated her]

(b) They would appear [to have underestimated her]

In (73), the italicised expression some hope of peace is the thematic complement of the unaccusative predicate remain; it remains in situ in the expletive structure (73a), but raises to become the subject of the seem-clause in (73b). In (74), the italicised expression remarkably little progress on disarmament is the thematic complement of the passive verb made; it remains in situ in the expletive structure (74a) but raises to become the subject of the appear-clause in (74b). In (75), the italicised expression Senator Slyme is the thematic subject of the verb lying: if the complement clause is a finite clause as in (75a), it surfaces as the subject of the complement clause; but if the complement clause is infinitival as in (75b), it surfaces as the subject of the seem clause. Likewise, in (76), the italicised pronoun they is the thematic subject of the verb underestimate: if the complement clause is finite as in (76a), it surfaces as the subject of the complement clause; if the complement clause is infinitival as in (76b), it surfaces as the subject of the appear clause.

Examples like (73-76) suggest that verbs like seem and appear resemble passive verbs in that they allow an expression which is a theta-marked argument of a predicate in a lower clause to raise to become the subject of the seem/appear-clause. Given this assumption, a sentence such as (73b) will have the following simplified derivation. At the point where the QP some hope of the peace has been formed (the noun peace having been merged with a null quantifier), it will be merged with (and θ-marked by) the verb remain to form the VP remain some hope of peace. This VP is then merged with the infinitival tense particle to, forming the T-bar to remain some hope of peace. Infinitival to (like all T constituents) has an [EPP] feature requiring it to have a noun or pronoun expression as its subject. One way of satisfying this requirement is by merging the expletive pronoun there in spec-T, so deriving the TP there to remain some hope of peace. The resulting infinitival TP is subsequently merged with the verb seem to form the VP seem there to remain some hope of peace. This in turn is merged with the present-tense auxiliary does to form the T-bar does seem there to remain some hope of peace. Like all T constituents, [T does] has an [EPP] feature which enables it to attract the closest noun or pronoun expression (= the expletive pronoun there) to become its subject, so forming the TP There does seem there to remain some hope of peace. This TP is then merged with a null complementiser marking the sentence as declarative in force, so forming the structure shown in simplified form below (with movement indicated by an arrow):

(77) \[CP \ [c \ \varnothing] \ [TP \ there \ [\varnothing \ [\text{does} \ [\varnothing \ [v \ \text{seem}] \ [\text{there} \ [\varnothing \ [\text{to} \ [\varnothing \ [v \ \text{remain} \ [\text{some hope of peace}]])])]]]  

And (77) is the structure of (73a) There does seem to remain some hope of peace.

Now consider the derivation of (73b) Some hope of peace does seem to remain. Assume that this proceeds as for (73a) until we have formed the T-bar to remain some hope of peace. Since infinitival to
(like all T constituents in English) has an [EPP] feature, it can (in conformity with the Attract Closest Principle) attract the closest nominal (= some hope of φ peace) to become its subject, so forming the TP some hope hope of φ peace to remain some hope of φ peace. The resulting TP is then merged with the verb seem to form the VP seem some hope of φ peace to remain some hope of φ peace. This VP is in turn merged with the present-tense T-constituent does to form the T-bar does seem some hope of φ peace to remain some hope of φ peace. Like all T-constituents, the T-auxiliary does has an [EPP] feature which allows it to attract the closest nominal (= some hope of φ peace) to become its subject, so forming the TP some hope of φ peace does seem some hope of a peace to remain some hope of a peace. Merging this TP with a null declarative complementiser forms the following structure (with arrows indicating A-movement operations which take place in the course of the derivation):

\[
(78) \quad [CP \ [c \emptyset] \ [TP \ some \ hope \ of \ φ \ peace \ [T \ does] \ [VP \ [v \ seems] \ [TP \ some \ hope \ of \ φ \ peace \ [T \ to] \ [[VP \ [v \ remain] \ some \ hope \ of \ φ \ peace]]]]
\]

The movement operation by which the noun or pronoun expression moves from being the specifier of a lower TP to becoming the specifier of a higher TP in (77) and (78) is traditionally known as raising (because it raises a noun or pronoun expression from being the subject of a lower clause to becoming the subject of a higher clause) but in reality it turns out to be yet another instance of the more general A-movement operation by which T attracts the closest nominal which it c-commands to become its specifier (and thereby move to spec-T). Words like seem/appear (when used with an infinival complement) have the property that the subject of the seem/appear-clause is created by being raised out of a complement clause, and so (for this reason) are known as raising predicates. The parallels between raising in structures like (78) and long-distance passivisation in structures like (68) should be obvious.

Note in addition that the assumption that the nominal some hope of peace moves from its underlying position as the complement of the verb remain into its superficial position as the subject of does in two successive steps (moving one TP at a time) means that A-movement in (78) obeys the Subjacency Condition (which bars extraction out of more than one containing TP in any single movement operation).

### 6.9 Comparing raising and control predicates

It might at first sight seem tempting to conclude from our discussion of long-distance passivisation structures like (72) and raising structures like (78) that all clauses containing a structure of the form verb+to+infinitive have a derivation in which some expression is raised out of the infinitive complement to become the subject of the main clause. However, any such conclusion would be undermined by our claim in §3.2 and §3.7 that some verbs which take to+infinitive complements are control predicates. In this connection, consider the difference between the two types of infinitive structure illustrated below:

\[
(79) \begin{align*}
(a) \quad & \text{He does seem [to scare them]} \\
(b) \quad & \text{He does want [to scare them]}
\end{align*}
\]

As used in (79), the verb seem is a raising predicate, but the verb want is a control predicate. We will see that this reflects the fact that the verbs seem and want differ in respect of their argument structure. We can illustrate this by sketching out the derivation of the two sentences.

In the raising structure (79a), the verb scare merges with (and assigns the EXPERIENCER θ-role to) its internal argument/thematic complement them. The resulting V-bar scare them then merges with (and assigns the AGENT θ-role to) its external argument/thematic subject he. The resulting VP he scare them is then merged with the infinitival tense particle to, so forming the T-bar to he scare them. Like all T constituents, to has an [EPP] feature which enables it to attract the closest noun or pronoun expression to become its subject, so forming the TP he to he scare them. This in turn merges with the raising verb seem to form the VP seem he to he scare them. The resulting VP is subsequently merged with the (emphatic) T-auxiliary does. The [EPP] feature carried by [γ does] enables it to attract he to become its subject, so forming the TP he does seem he to he scare them. The resulting TP is merged with a null C which marks
the clause as declarative in force, so forming the structure shown in simplified form below (with each of the arrows marking a separate application of A-movement):

(80) \[ CP \ [c \ θ] \ [TP he \ [T does] \ [VP \ [v \ seem] \ [TP he \ [T to] \ [VP he \ [v \ scare] \ them]]]] \]

The successive-cyclic (one-TP-at-a-time) application of A-movement in (80) satisfies the Subjacency Condition (which bars a constituent from being extracted out of more than one TP in any single movement operation).

A key assumption made in the raising analysis in (80) is that the verb *seem* (as used there) is a one-place predicate whose only argument is its infinitival TP complement, to which it assigns an appropriate \( θ \)-role – perhaps that of *Theme* argument of *seem*. This means that the VP headed by *seem* has no thematic subject: note, in particular, that the verb *seem* does not \( θ \)-mark the pronoun *he*, since *he* is \( θ \)-marked by *scare*, and the \( θ \)-criterion (25) rules out the possibility of any argument being \( θ \)-marked by more than one predicate. Nor does the VP headed by *seem* have a structural subject at any stage of derivation, since *he* raises to become first the subject of the lower TP headed by infinitival *to*, and then to become the subject of the higher TP headed by the present-tense T-auxiliary *does*. This underlines the point that syntactic movement operations can only move a constituent to the edge (i.e. head or specifier position) of a *functional projection* like TP or CP, not to the edge of a lexical projection like VP.

Now let’s turn to consider the derivation of the control infinitive structure (79b) *He does want to scare them*. As before, the verb *scare* merges with (and assigns the EXPERIENCER \( θ \)-role to) its internal argument (i.e. thematic complement) *them*. The resulting V-bar *scare them* then merges with (and assigns the AGENT \( θ \)-role to) its external argument. Given the assumption we made in §3.2 that control infinitives have a particular kind of null pronominal subject known as ‘big PRO’, the thematic subject of *scare them* will be PRO, and this will be merged in spec-V (in accordance with the VP-Internal Subject Hypothesis), and thereby be assigned the \( θ \)-role of AGENT argument of *scare*. The resulting VP PRO *scare them* then merges with infinitival *to*, forming the T-bar to PRO *scare them*. The [EPP] feature of infinitival *to* enables it to attract PRO to become its subject, so forming the TP PRO to PRO *scare them*. Given the conclusion we drew in §3.8 that control infinitives are CPs, this TP will in turn merge with a null infinitival complementiser to form the CP PRO to PRO *scare them*. The CP thereby formed serves as the internal argument (and thematic complement) of the verb *want*, so is merged with *want* and thereby assigned the \( θ \)-role of THEME argument of *want*. The resulting V-bar *want θ PRO to PRO scare them* then merges with its external argument (and thematic subject) *he*, assigning *he* the thematic role of EXPERIENCER argument of *want*. The resulting VP *he want θ PRO to PRO scare them* then merges with the T-auxiliary *does*, forming the T-bar *does he want θ PRO to PRO scare them*. The [EPP] feature carried by [\( T \) does] enables it to attract the closest noun or pronoun expression which it c-commands (= *he*) to become its subject, so forming the TP *he does he want θ PRO to PRO scare them*. Merging the resulting TP with a null declarative complementiser forms the structure shown in simplified form below (with arrows indicating the two different A-movement operations taking place in the course of the derivation):

(81) \[ CP \ [c \ θ] \ [TP He \ [T does] \ [VP he \ [v want] \ [CP \ [c \ θ] \ [TP PRO \ [T to] \ [VP PRO \ [v \ scare] \ them]]]] \]

The resulting structure satisfies the \( θ \)-criterion (which requires each argument to be assigned a single \( θ \)-role, and each \( θ \)-role to be assigned to a single argument), in that *he* is the EXPERIENCER argument of *want*, the bracketed CP in (81) is the THEME complement of *want*, PRO is the AGENT argument of *scare*, and *them* the EXPERIENCER argument of *scare*.

The analysis of control predicates presented here differs from that presented in chapter 3 in that it assumes that the PRO subject of a control infinitive like that bracketed in (79b) *He does want to scare them* is merged in spec-V, and not (as assumed in chapter 3) in spec-T. The requirement for PRO to be generated in spec-V follows from the VP-Internal Subject Hypothesis and the Predicate-Internal Theta-Marking Hypothesis which posit that arguments are generated and theta-marked internally to a projection of their predicate, so that PRO (by virtue of being the agent argument of *scare*) is generated as the specifier.
of the VP headed by *scare*. However, given that all T constituents in English have an [EPP] feature, the [EPP] feature on infinitival *to* will attract PRO to move out of the VP in which it originates into the specifier position within the TP headed by infinitival *to*. Since movement of an empty category like PRO out of the VP into spec-T is by nature invisible, an obvious question which arises is whether there is any empirical evidence that PRO moves to spec-T rather than remaining in situ within VP. The answer, as we shall see, is ‘Yes’.

One piece of evidence suggesting that PRO does indeed move to spec-T in control infinitives comes from the syntax of constituents like those italicised in (82) below which have the property that they are construed as modifying a bold-printed antecedent which is not immediately adjacent to them in the relevant structure:

(82)(a) They were both priding themselves on their achievements
(b) I don’t *myself* think that Svengali was the best choice for England manager
(c) He was *personally* held responsible

*Both* in (82a) is a floating quantifier (and each/all can be used in a similar fashion); *myself* in (82b) is a floating emphatic reflexive; and *personally* in (82c) is an argument-oriented adverb (construed as modifying an argument, in this case *he*). In each sentence in (82), the italicised expression is construed as modifying the bold-printed subject of the clause. Contrasts such as those in (83) and (84) below:

(83)(a) Two republican senators *were themselves* thought to have been implicated
(b) *There were themselves* thought to have been implicated two republican senators

(84)(a) Two republican senators *are both* thought to have been implicated
(b) *There are both* thought to have been implicated two republican senators

suggest that a floating modifier must be c-commanded by its bold-printed antecedent.

In the light of the requirement for a floating modifier to be c-commanded by its antecedent, consider the syntax of the bracketed clauses in the following sentences:

(85)(a) [To *both* be betrayed by their friends] would be disastrous for Romeo and Juliet
(b) [To *themselves* be indicted] would be unfair on the company directors
(c) It was upsetting [to *personally* have been accused of corruption]

In each of these examples, the bracketed clause is a control clause containing a PRO argument. In each case, PRO is the thematic complement of a passive participle (viz. betrayed/indicted/accused). Hence, if control *to* had no [EPP] feature and PRO remained in situ, the TP in the bracketed infinitive complement in (85b) would have the skeletal structure (86a) below, but if (as suggested here) control *to* has an [EPP] feature, this will trigger movement of PRO to become the structural subject of *to* – as in (86b):

(86)(a) \[CP [c \ø] [TP [I to] [AUXP themselves [AUX be] [VP [V \ø] indicted] PRO]]\]
(b) \[CP [c \ø] [TP PRO [I to] [AUXP themselves [AUX be] [VP [V \ø] indicted] PRO]]\]

Given the requirement for a floating emphatic reflexive to be c-commanded by its antecedent, and given that PRO is the intended antecedent of *themselves* in (86), it is clear that (86a) cannot be the right structure, since PRO does not c-command *themselves* in (86a). By contrast, movement of PRO to spec-T in (86b) means that PRO will indeed c-command *themselves*, so correctly predicting that (86b) is grammatical. Thus, sentences such as (85) provide us with empirical evidence that PRO moves to spec-T in control clauses, and thereby becomes the subject of infinitival *to*. This in turn is consistent with our more general claim that all T-constituents in English have an [EPP] feature requiring them to have a subject.

Having compared the syntax of control predicates with that of raising predicates, we end this chapter by looking briefly at the question of how we can determine whether a given predicate which selects an infinitival *to* complement is a control predicate or a raising predicate (See Davies and Dubinsky 2004 for a more detailed analysis). In this connection, it should be noted that there are a number of syntactic differences between raising and control predicates which are a direct reflection of the different thematic properties of these two types of predicate. For example, raising predicates like *seem* can have expletive *it*/*there* subjects, whereas control predicates like *want* cannot: cf.

(87)(a) *It seems/**wants* to be assumed that he lied to Congress
(b) *There seem/**want* to remain several unsolved mysteries
(The expletive nature of *it* in (87a) is shown by the fact that it cannot be substituted by a referential pronoun like *this/that*, or questioned by *what*? Likewise, the expletive nature of *there* in (87b) is shown by the fact that it cannot be substituted by a referential locative pronoun like *here*, or questioned by *where*?) This is because control predicates like *want* are two-place predicates which project a thematic subject (an EXPERIENCER in the case of *want*, so that the subject of *want* must be an expression denoting a sentient entity capable of experiencing desires), and non-referential expressions like expletive *it/there* clearly do not denote sentient entities and so cannot serve as the thematic subject of a verb like *want*. By contrast, raising predicates like *seem* have no thematic subject, and hence impose no restrictions on the choice of structural subject in their clause, so allowing a (non-thematic) expletive subject.

Similarly, raising predicates like *seem* (but not control predicates like *want*) allow idiomatic subjects such as those italicised below:

(88) Whenever they meet, ...

(a) all hell *seems/#wants* to break loose  
(b) the fur *seems/#wants* to fly  
(c) the cat *seems/#wants* to get his tongue

The ungrammaticality of sentences like *All hell wants to break loose* can be attributed to the fact that *want* is a control predicate, and hence (in order to derive such a structure) it would be necessary to assume that all hell originates as the subject of *want*, and that *break loose* has a separate PRO subject of its own; but this would violate the requirement that (on its idiomatic use) all hell can only occur as the subject of *break loose*, and conversely *break loose* (in its idiomatic use) only allows all hell as its subject. By contrast, *all hell seems to break loose* is grammatical because *seem* is a raising predicate, and so all hell can originate as the subject of *break loose* and then be raised up to become the subject of the tense affix in T in the *seem* clause.

A further property which differentiates the two types of predicate is that raising predicates like *seem* preserve truth-functional equivalence under passivisation, so that (89a) below is synonymous with (89b):

(89)(a) John seems to have helped Mary  
(b) =Mary seems to have been helped by John

By contrast, control predicates like *want* do not preserve truth functional equivalence under passivisation, as we see from the fact that (90a) below is not synonymous with (90b):

(90)(a) John wants to help Mary  
(b) ≠Mary wants to be helped by John

Moreover, there are pragmatic restrictions on the choice of subject which control predicates like *want* allow (in that the subject generally has to be a rational being, not an inanimate entity) – as we see from (91) below (where ! marks pragmatic anomaly):

(91) My cat/!My gesture wants to be appreciated

By contrast, raising predicates freely allow animate or inanimate subjects: cf.

(92) My cat/My gesture seems to have been appreciated

The different properties of the two types of predicate stem from the fact that control predicates like *seem* do not 0-mark their subjects, whereas raising predicates like *seem* do not: so, since *want* selects an EXPERIENCER subject as its external argument (and prototypical EXPERIENCERS are animate beings), *want* allows an animate subject like *my cat*, but not an inanimate subject like *my gesture*. By contrast, since raising predicates like *seem* do not 0-mark their subjects, they allow a free choice of subject. An important point to note is that although our discussion of raising and control predicates has revolved around verbs, a parallel distinction is found in adjectives. For example, in sentences such as:

(93)(a) John is *likely* to win the race  
(b) John is *keen* to win the race

the adjective *likely* is a raising predicate and *keen* a control predicate. We can see this from the fact that *likely* allows expletive and idiomatic subjects, but *keen* does not: cf.

(94)(a) There is *likely/#keen* to be a strike  
(b) *All hell is likely/#keen* to break loose

This is one reason why throughout this chapter we have talked about different types of *predicate* (e.g. drawing a distinction between raising and control predicates) rather than different types of *verb*.
A final comment to make is that in this chapter we have presented the ‘classical’ account of control, which assumes an embedded PRO subject carrying a theta-role of its own controlled by a matrix subject which carries a separate theta role of its own. However, an alternative Movement Theory of Control/MTC has been developed by O’Neil (1995), Hornstein (1999, 2001, 2003), Boeckx (2000) and Boeckx and Hornstein (2003, 2004, 2006). MTC argues that control structures involve the same kind of A-movement operation as raising structures, but with the difference that the raised subject moves into a non-thematic position in raising structures but into a thematic position (thereby acquiring a second theta-role) in control structures. On this view, a sentence like *Jim will try to open it would have the structure shown in simplified form below:

(95) \[
\begin{array}{c}
\text{CP} \\
\text{[C \theta]} \\
\text{TP Jim [T will]} \\
\text{[TP Jim [v try] [TP Jim [T to] [VP Jim [v open] it]]]]}
\end{array}
\]

That is, Jim (which is a DP headed by a null determiner) will originate within the embedded VP as the AGENT argument of open, then raise into the specifier position within the embedded TP, then into the specifier position in the matrix VP (where it receives a second theta-role as AGENT argument of try), and finally into specifier position within the matrix TP. On this view (which entails rejection of the Theta Criterion 25), control is unified with raising, and control complement clauses are TPs rather than CPs.

However, the movement analysis of control proves problematic in respect of certain types of control structure such as those below (96b being from Landau 2006, p.156):

(96)(a) It is difficult [PRO to learn a foreign language]
(b) Mary proposed to Paul [PRO to become partners]

In an arbitrary control structure like (96) where PRO denotes ‘any arbitrary person you care to think of’, it is implausible that PRO could be a null copy of a moved antecedent, since it has no antecedent within the sentence containing it. Equally problematic for the movement analysis of control is a split control sentence like (96b) in which PRO has split (i.e. multiple) antecedents and refers back both to Paul and to Mary: clearly, it would be implausible to suppose that PRO is a copy of two separate moved constituents. Moreover, if a control predicate like try selects a TP complement, we should expect to find that the subject of its infinitive complement can be passivised – and yet the ungrammaticality of sentences such as (97) below suggests that this is not the case:

(97)(a) *Jim will be tried to open it
(b) *That was tried to be done last year

For reasons such as these, we shall keep to the classical account of control structures here. (For completeness, we should also note a further account of control which posits that PRO does not exist, and that control clauses are subjectless: See e.g. Jackendoff and Culicover 2003; Culicover and Jackendoff 2001, 2005, 2006).

6.10 Summary
This chapter has primarily been concerned with the syntax of subjects. In §6.2 we argued that Belfast English structures such as *There should some students get distinctions provide us with evidence that subjects originate internally within VP, and we noted that the claim that subjects originate internally within VP is known as the VP-Internal Subject Hypothesis/VPISH. We also maintained that sentences such as Some students should get distinctions involve movement of some students from the specifier position within VP to the specifier position within TP, and we noted that the relevant movement operation is known as A-movement. In §6.3 we suggested that idiomatic structures like All hell will break loose provide empirical support for the VPISH. In §6.4 we argued that the VP-Internal Subject Hypothesis allows us to posit a uniform mapping (i.e. relationship) between thematic argument structure and (initial) syntactic structure, if we suppose that all arguments of a predicate originate (and are theta-marked) internally within a projection of the predicate. In §6.5, we looked at the syntax of unaccusative predicates like arise/remain/occur etc. and hypothesised that the argument of an unaccusative verb originates as its complement but differs from the complement of a transitive verb in that it has no subject, and receives nominative rather than accusative case. We highlighted a number of further differences between unaccusative predicates and other types of predicate (e.g. in relation to the position of subjects in Belfast English imperatives, and auxiliary selection in earlier varieties of English). In §6.6, we looked at
the structure of simple passive clauses, arguing that a passive subject originates as the thematic complement of a subjectless passive participle, and is raised into spec-T (via A-movement) in order to satisfy the [EPP] feature of T. In §6.7 we saw that passivisation can be a long distance operation involving movement of an argument contained within an infinitival TP which is the complement of a passive participle. We saw that (in consequence of every T carrying an EPP feature requiring it to have a subject), the passivised nominal moves in a successive cyclic fashion, from a lower spec-T position into a higher one – in conformity with locality constraints such as Chomsky’s Subjacency Condition or Rizzi’s Relativised Minimality Condition. In §6.8 we argued that predicates like seem/appear function as raising predicates in the sense that their subjects originate internally within their infinitive complement, and from there are raised to spec-T position within the seem/appear-clause: hence, in a sentence such as All hell would appear to have broken loose, the idiomatic expression all hell originates as the subject of broken loose and from there is raised up (one TP at a time) first to become the specifier of the lower TP headed by infinitival to, and then to become the specifier of the higher TP headed by would. In §6.9, we contrasted raising predicates with control predicates, noting that they differ in that control predicates theta-mark their subjects (and hence generally require an animate subject) and have a CP complement, whereas raising predicates do not theta-mark their subjects (and hence freely allow inanimate, expletive and idiomatic subjects) and have a TP complement. We also noted that (unlike control predicates), raising predicates preserve truth-functional equivalence under passivisation.

WORKBOOK SECTION

Exercise 6.1

Say whether the italicized verbs as used in the type of construction illustrated in the examples below function as raising or control predicates (or are ambiguous and can serve as both), and what evidence there is to support your analysis. Provide a detailed outline of the derivation of any one of the control sentences and any one of the raising sentences, giving arguments in support of your answer.

1. Employers tend to exploit employees
2. He has decided to admit it
3. We came to appreciate the classes
4. You have to help me
5. They failed to hit the target
6. He tried to rectify the situation
7. He refused to sign the petition
8. He’s beginning to irritate me
9. They attempted to pervert the course of justice
10. I happened to be passing your house
11. He is going to help me
12. He stands to lose a fortune
13. John promises to be a good student
14. He needs to have a shave
15. They managed to open the door
16. We intend to close the store
17. The weather is threatening to ruin the weekend
18. We are hoping to get a visa
19. She has chosen to ignore him
20. They are planning to visit London

In addition, comment on what is interesting about the following sentence (produced by a former captain of the England soccer team in a TV interview):

21. Racism has been trying to be cut out of the game for a number of years now

Model answer for 1

There are a number of reasons for suggesting that tend functions as a raising predicate when it takes an infinitive complement. For one thing (as we would expect if tend is a one-place raising predicate which does not theta-mark its subject), tend imposes no restrictions on its choice of subject, and so freely allows either an expression like Professor Brainstorm (denoting an animate being) or an expression like Syntax (denoting an inanimate entity) as the subject of its containing clause – as illustrated in (i) below:

(i) Professor Brainstorm/Syntax tends to baffle people

Moreover, tend allows a nonthematic subject like expletive there/it – as in the examples below:

(ii) There tends to be a lot of confusion about syntax
(iii) It tends to be assumed that syntax is hard

(We can tell that there is an expletive pronoun in (ii) from the fact that it cannot be substituted by here or questioned by where? Likewise, it must be expletive in (iii) because it cannot be substituted by this/that or
questioned by what?) Moreover, *tend* can have an idiomatic subject, as in (iv) below:

(iv)  All hell tends to break loose

Given that *all hell* can serve only as the subject of *break loose* in the relevant idiom in (iv), it is clear that we could not analyse *tend* as a control predicate in (iv) and claim that *all hell* originates as the subject of *tend* and PRO as the subject of *break loose*, since this would violate the requirement that *all hell* can occur only as the subject of *break loose* and conversely that *break loose* can only have the subject *all hell* (in the relevant idiom). By contrast, if *tend* is a raising predicate, we can claim that *all hell* originates as the subject of *break loose* and then raises up to become the subject of the (null T constituent in the) *tend* clause. Furthermore, *tend* preserves truth-functional equivalence under passivisation, as we can see from the fact that (v) and (vi) are truth-functionally equivalent:

(v) Employers tend to exploit employees   (vi)  =Employees tend to be exploited by employers

If (as argued here) *tend* is a raising predicate, sentence 1 will be derived as follows. The noun *employees* merges with a null quantifier (which has a generic interpretation paraphrasable as ‘employees in general’) to form the QP ø employees. The resulting QP merges with (and is assigned the θ-role of THEME argument of) the verb *exploit* to form the V-bar exploit ø employees. The QP ø employers (itself formed by merging a null generic quantifier with the noun *employers*) is then merged with (and assigned the θ-role of AGENT argument of) this V-bar, forming the VP ø employers exploit ø employees. This VP is merged as the complement of the infinitival tense particle *to*, forming the T-bar to ø employers exploit ø employees. Infinitival *to* (like all T constituents) has an [EPP] feature which enables it to attract the closest nominal (= the QP ø employers) to become its subject, so forming the TP ø employers to ø employers exploit ø employees. The relevant TP is in turn merged with the verb *tend*, forming the VP ø employers to ø employers exploit ø employees (with the TP complement of *tend* having the semantic function of being a THEME argument of *tend*). The resulting VP is merged with a T-constituent containing a present-tense affix (= Af) forming the T-bar Af ø employers to ø employers exploit ø employees. The [EPP] feature on T enables it to attract the closest nominal which it c-commands (= the QP ø employers) to become its subject, so forming the TP ø employers Af ø employers to ø employers exploit ø employers. The resulting TP is merged with a null declarative C to form the CP shown in simplified form below (with arrows showing the two A-movement operations which take place in the course of the derivation):

(vii)  \[ CP \[ C \[ ø employees \[ T [ Af \[ VP \[ v tend \[ TP \[ ø employers \[ t to \[ VP \[ ø employers \[ v exploit \[ employees \[ ]] \[ ]] \[ ]] \[ ]] \[ ]] ] \[ ]] ] \[ ]] ] \[ ]] ]

The derivation satisfies the θ-criterion by virtue of the fact that each argument carries one and only one θ-role: i.e. ø employees is the THEME argument of exploit, ø employers is the AGENT argument of exploit and the TP complement of *tend* is its THEME argument. It also satisfies the Subjacency Condition (which bars extraction out of more than one TP in any single movement operation) in that neither A-movement operation in (vii) moves the italicised QP out of more than one containing TP.

**Exercise 6.2**

Discuss the derivation of the following sentences:

1a  There are certain to remain some problems
b  There were reported to remain some problems
c  There were thought likely to remain some problems

2a  A change of policy was envisaged
b  A change is thought to be envisaged
c  A change seems likely to be envisaged

3a  Differences of opinion are emerging
b  Differences of opinion are starting to emerge
c  Differences of opinion appear to be starting to emerge
4a He is leaving the country
b He is planning to leave the country
c He is thought to be planning to leave the country

5a No details are going to be revealed
b No details of any threats are expected to emerge
c No details are expected to emerge of any threats

6a Nothing has happened
b Nothing is expected to happen
c What is thought likely to happen?

**Helpful hints**
Assume that the infinitive form *be* is an auxiliary occupying the head AUX position of AUXP when immediately followed by a passive or progressive participle. Assume that T always has an [EPP] feature, whether finite or infinitival. In addition, assume that *he* has the thematic role of an EXPERIENCER argument of the relevant predicates in 4, but that all other arguments in 1-6 are THEME arguments of their associated predicates. In relation to 5b and 5c assume that *any* is a partitive quantifier which has the property of being a polarity item (in the sense specified in exercise 2.2), and so must be c-commanded by a negative or interrogative constituent; in relation to 5c, bear in mind the discussion of discontinuous spellout in the text.

**Model answer for 1a**
The quantifier *some* merges with the noun *problems* to form the QP *some problems*. This QP is merged with (and assigned the θ-role of THEME complement of) the unaccusative predicate *remain* to form the VP *remain some problems*. This in turn is merged with the infinitival tense particle *to*, forming the TP *to remain some problems*. Like all T constituents, infinitival *to* has an [EPP] feature requiring it to have a noun or pronoun expression as its subject, and this requirement can be met by merging the expletive pronoun *there* with the T-bar already formed, so generating the TP *there to remain some problems*. This TP is then merged with the raising adjective *certain* to form the AP *certain there to remain some problems*. The resulting TP in turn is merged with the copular verb *are* to form the VP *are certain there to remain some problems*. This VP is subsequently merged with a null finite T which attracts the copula *are* to move from V to T in the manner showed by the dotted arrow in (i), so forming the following structure (simplified by not showing the internal structure of the QP *some problems*):

(i)  
```
T''
  |   T
  |   V
  |   AP
  |   a
  |   certain
  |   PRN
  |   there
  T
  to
  V
  QP
```

Like all T constituents, the T-auxiliary *are* has an [EPP] feature (not shown above) which allows it to attract *there* to move to spec-T to become its subject in the manner shown in simplified form in (ii) below:
The TP in (ii) is subsequently merged with a null complementiser which serves to mark the sentence as declarative in force. The italicised A-movement operation satisfies the Subjacency Condition (which prevents a constituent from being extracted out of more than one containing TP in any single movement operation), since the arrowed movement operation in (ii) crosses only one TP boundary – as shown in simplified schematic form below:

![Diagram](image)

The analysis presented here assumes that *certain* is a raising adjective. Evidence that this is so comes from the fact that clauses containing *certain* allow expletive and idiomatic subjects, as in:

(iv)(a) *It* is certain to be raining in Manchester

(b) *The fur* is certain to fly

The expletive nature of *it* in (iiiia) is shown by the fact that it cannot be substituted by referential pronouns like *this*/*that* or questioned by *what*?

---

(ii)

TP

PRN

there

T

are

VP

are
certain

there
to

remain

some

problems
7.

Agreement, Case and A-Movement

7.1 Overview

In this chapter, we take a look at the syntax of agreement. We begin by outlining the claim made by Chomsky in recent work that agreement involves a relation between a probe and a goal (though it should be noted that the term goal in this chapter is used in an entirely different way from the term GOAL – written in capital letters – which was used to denote the thematic role played by a particular kind of argument in relation to its predicate in §6.4). We look at the nature of agreement, and go on to show that nominative and null case-marking involve agreement with T. In addition, we explore the relationship between the [EPP] feature carried by T and agreement, and look at the consequences of this for control infinitives on the one hand and raising infinitives on the other.

7.2 Agreement

In traditional grammars, finite auxiliaries are said to agree with their subjects. Since (within the framework used here) finite auxiliaries occupy the head T position of TP and their subjects are in spec-T, in earlier work agreement was said to involve a specifier-head relationship (between T and its specifier). However, there are both theoretical and empirical reasons for doubting that agreement involves a spec-head relation. From a theoretical perspective (as we saw in §3.9), Minimalist considerations lead us to the conclusion that we should restrict the range of syntactic relations used in linguistic description, perhaps limiting them to the relation c-command created by merger. From a descriptive perspective, a spec-head account of agreement is problematic in that it fails to account for agreement between the auxiliary were and the nominal several prizes in passive structures such as:

(1) There were awarded several prizes

Since the auxiliary were occupies the head T position of TP in (1) and the expletive pronoun there is in spec-T, a spec-head account of agreement would lead us to expect that were should agree with there. But instead, were agrees with the in situ complement several prizes of the passive participle awarded. What is going on here? In order to try and understand this, let’s take a closer look at the derivation of (1).

The quantifier several merges with the noun prizes to form the QP several prizes. This QP is merged with the passive verb awarded to form the VP awarded several prizes. The resulting VP is in turn merged with the passive auxiliary BE, forming the T-bar shown in simplified form in (2) below (where the notation BE indicates that the morphological form of the relevant item hasn’t yet been determined):

(2) \[
\begin{array}{c}
T' \\
T \\
BE \\
VP \\
V \\
awarded \\
QP \\
several prizes \\
\end{array}
\]

The tense auxiliary \([T \ BE]\) needs to agree with an appropriate nominal within the structure containing it. Given Pesetsky’s Earliness Principle (which requires operations to apply as early as possible in a derivation), T-agreement must apply as early as possible in the derivation, and hence will apply as soon as BE is introduced into the structure. On the assumption that c-command is central to syntactic operations, T will agree with a nominal (i.e. a noun or pronoun expression) which it c-commands. Accordingly, as soon as the structure in (2) is formed, \([T \ BE]\) searches for a nominal which it c-commands to agree with.

To use the terminology introduced by Chomsky (1998, 1999, 2001), by virtue of being the highest head in the overall structure at this point in the derivation, BE serves as a probe which searches for a c-commanded nominal goal to agree with. The only nominal goal c-commanded by \([T \ BE]\) within the structure in (2) is the QP several prizes: \([T \ BE]\) therefore agrees in person and number with several prizes,
and so is ultimately spelled out as the third person plural form *were* in the PF component. Chomsky refers to person and number features together as *φ*-features (where φ is the Greek letter phi, pronounced in the same way as *fie* in English): using this terminology, we can say that the probe [*T BE*] agrees in *φ*-features with the goal *several prizes*. If we follow the analysis of expletives in Chomsky (1999), expletive *there* will be directly merged in spec-T to satisfy the [EPP] requirement for T to project a nominal specifier, and the resulting TP is in turn merged with a null declarative complementiser to form the CP shown in simplified form below:

(3)

```
CP
  
  C
  φ
  PRN
  there
  T
  T'
  VP
  were
  QP
  awarded
  *several prizes*
```

And (3) is the structure of (1) *There were awarded several prizes*.

However, there are a number of details which we have omitted in (3); one relates to the case assigned to the complement (*several prizes*) of the passive participle *awarded*. Although case is not overtly marked on the relevant noun expressions in English, evidence from languages like Icelandic with a richer case system suggests that the complement of a passive participle in finite expletive clauses is assigned nominative case via agreement with T – as the following contrast (from Sigurðsson 1996, p.12) illustrates:

(4)(a) Þad voru lesnar fjórar bækur
    There were read four NOM.PL books NOM.PL

(b) Þad var skilað fjórum bókum
    There was returned four DAT.PL books DAT.PL

In (4a), the auxiliary *voru* is a third person plural form which agrees with the NOM.PL/nominative plural complement *fjórar bækur* ‘four books’. In (4b), the auxiliary is in the agreementless form *var* ‘was’, and the complement of the passive participle is DAT.PL/dative plural. (*Var* is a third person singular form, but can be treated as an agreementless form if we characterise agreement by saying that ‘An auxiliary is first/second person if it agrees with a first/second person subject, but third person otherwise; it is plural if it agrees with a plural subject, but singular otherwise.’ This means that a third person singular auxiliary can arise either by agreement with a third person singular expression or – as here – can be a default form used as a fall-back when the auxiliary doesn’t agree with anything.) Sigurðsson argues that it is an inherent lexical property of the participle *skilað* ‘returned’ that (like around a quarter of transitive verbs in Icelandic) it assigns so-called inherent dative case to its complement (inherent case being assigned by a verb to one of its arguments which has a specific thematic role, and hence being thematically based: see Svenonius 2002a, b on dative complements): consequently, (because it can’t agree with a non-nominative complement) the auxiliary surfaces in the agreementless form *var* in (4b); by contrast, the participle *lesnar* ‘read’ in (4a) does not assign inherent case to its complement, and instead the complement is assigned (so-called) structural nominative case via agreement with the past Tense auxiliary *voru* ‘were’.

Icelandic data like (4) suggest that there is a systematic relationship between nominative case assignment and T-agreement: they are two different reflexes of an agreement relationship between a finite T probe and a nominal goal. In consequence of the agreement relationship between the two, the T probe agrees with a nominal goal which it c-commands, and the nominal goal is assigned nominative case. Accordingly, *several prizes* in (3) receives nominative case via agreement with [*T are*]. (It should be noted in passing that throughout this chapter, we focus on characterising syntactic agreement. On so-called ‘semantic agreement’ in British English structures like *The government are ruining the country*, see den Dikken 2001, and Sauerland and Elbourne 2002.)

The approach to case assignment outlined here (in which subjects are assigned nominative case via agreement with a finite T) might at first sight seem to be competely at odds with our earlier claim in §3.9.
that subjects are case-marked by a c-commanding C constituent. But in one sense, our revised hypothesis that finite subjects are case-marked by T is consistent with our earlier analysis. In chapter 3, we argued that (in consequence of the Earliness Principle) a noun or pronoun expression is case-marked by the closest case-assigner which c-commands it: since we also assumed in chapter 3 that subjects originate in spec-T, it was natural to assume that they are case-marked by the closest functional head above them, namely C. But once we move to an analysis like that in chapter 6 in which subjects originate internally within VP, our assumption that they are case-marked by the closest functional head above them leads to the conclusion that nominative subjects are case-marked by T rather than by C (because T is the closest functional head above a VP-internal subject). The apparent discrepancy between these two approaches can be resolved if (as argued in Chomsky 2005b, 2006) agreement features originate on C but are ‘handed over’ to T in the course of the derivation (for theoretical reasons which we look at in chapter 9).

### 7.3 Feature Valuation

Let’s think through rather more carefully what it means to say that case is systematically related to agreement, and what the mechanism is by which case and agreement operate. To illustrate our discussion, consider the derivation of a simple passive such as that produced by speaker B below:

(5) **SPEAKER A:** What happened to the protestors?

**SPEAKER B:** They were arrested

Here, discourse factors determine that a third person plural pronoun is required in order to refer back to the third person plural expression *the protestors*, and that a past tense auxiliary is required because the event described took place in the past. So (as it were) the person/number features of *they* and the past tense feature of *were* are determined in advance, before the items enter the derivation. By contrast the case feature assigned to *they* and the person/number features assigned to *were* are determined via an agreement operation in the course of the derivation: e.g. if the subject had been the singular pronoun *one*, the auxiliary would have been third person singular via agreement with *one* (as in *One was arrested*); and if *THEY* had been used as the object of a transitive verb (as in *The police arrested them*), it would have surfaced in the accusative form *them* rather than the nominative form *they*.

Generalising at this point, let’s suppose that noun and pronoun expressions like *THEY* enter the syntax with their (person and number) φ-features already valued, but their case feature as yet unvalued. (The notation *THEY* is used here to provide a case-independent characterisation of the word which is variously spelled out as *they/them/their* depending on the case assigned to it in the syntax.) Using a transparent feature notation, let’s say that *THEY* enters the derivation carrying the features \[3-Pers, Pl-Num, u-Case\], where \(Pers = \text{person}, Pl = \text{plural}, Num = \text{number}, \text{and} \ u = \text{unvalued}\). Similarly, let’s suppose that finite T constituents (like the tense auxiliary BE) enter the derivation with their tense feature already valued, but their person and number φ-features as yet unvalued (because they are going to be valued via agreement with a nominal goal). This means BE enters the derivation with the features \[Past-Tns, u-Pers, u-Num\]. In the light of these assumptions, let’s see how the derivation of (5B) proceeds.

The pronoun *THEY* is the thematic complement of the passive verb *arrested* and so merges with it to form the VP *arrested THEY*. This is in turn merged with the tense auxiliary BE, forming the structure (6) below (where already-valued features are shown in **bold**, and unvalued features in *italics*):

(6)

```
T
   T'
      BE [Past-Tns] V arrested PRN THEY
            [u-Pers] [3-Pers]
            [u-Num] [Pl-Num]
            [u-Case]
```

Given Pesetsky’s **Earliness Principle**, the T-auxiliary BE will probe at this point and search for a suitable goal. Chomsky (1999, p.4) posits that ‘Probe and Goal must both be active’ for operations like agreement or case-marking to apply, and that a constituent (whether Probe or Goal) is active only if it contains one or more uninterpretable features. BE is active by virtue of its uninterpretable (and unvalued) person/number
features, and THEY is active by virtue of its uninterpretable (and unvalued) case-feature. Accordingly, BE serves as an active probe which locates THEY as the only active goal in its c-command domain. The unvalued φ-features on the probe are then valued by the goal, and (conversely) the unvalued case-feature on the goal is valued by the probe. (In Chomsky’s use of these terms, it is the unvalued person/number features which serve as probes rather than the item BE itself, but this is a distinction which we shall overlook throughout, in order to simplify exposition.) For concreteness, let us suppose that Agreement can be characterised informally as involving the two feature-valuation suboperations sketched below:

(7) **Agreement**
   When an active probe (like T) agrees with one or more active goals in its local domain
   
   (i) the unvalued (person/number) φ-features on the probe will be valued (i.e. assigned a value which is a copy of that on the goal/s)
   
   (ii) the unvalued case feature/s on the goal/s will be valued (i.e. assigned a value dependent on the nature of the probe – e.g. nominative if the probe is a finite T)

In the light of our informal characterisation of agreement in (7), let’s return to consider what happens when we reach the stage of derivation in (6) above where Agreement applies. In consequence of φ-feature-valuation suboperation in (7i), the values of the person/number features of THEY are copied onto BE, so that the unvalued person and number features [u-Pers, u-Num] on BE in (6) are assigned the values [3-Pers, Pl-Num] carried by THEY. At the same time, via the case-valuation suboperation (7ii), the unvalued case feature [u-Case] carried by the goal THEY is valued as nominative by the finite T-probe BE.

Thus, application of Agreement to the structure in (6) results in the structure shown in (8) below (where the underlined features are the ones which have been valued via Agreement):

(8)   T
    BE
    VP
    [Past-Tns]
    [3-Pers]
    [Pl-Num]
    V
    arrested
    PRN
    [3-Pers]
    [Pl-Num]
    [Nom-Case]

Since all the features carried by BE are now valued, BE can ultimately be spelled out in the phonology as the third person plural past tense form *were*. Likewise, since all the features carried by THEY are also valued at this point, THEY can ultimately be spelled out as the third person plural nominative form *they*. However, the derivation in (8) is not yet terminated: the [EPP] feature of T (not shown above) will subsequently trigger A-movement of THEY to become the structural subject of *were*, and the resulting TP *they were arrested* will then be merged with a null declarative complementiser to form the structure shown in skeletal form below:

(9)   [CP [c ə] [TP They [T were] [VP [v arrested] they]]]

But since our immediate concern is with case and agreement, we skip over these details here.

### 7.4 Uninterpretable features and feature-deletion

Our discussion of how case and agreement work in a sentence such as (5b) has wider implications. One of these is that items may enter the derivation with some of their features already valued and others as yet unvalued: e.g. BE enters the derivation in (6) with its tense feature valued, but its (person and number) φ-features unvalued; and THEY enters with its φ-features valued but its case feature unvalued. This raises the question of which features are initially valued when they first enter the derivation, which are initially unvalued – and why. Chomsky (1998) argues that the difference between valued and unvalued grammatical features correlates with a further distinction between those grammatical features which are interpretable (in the sense that they play a role in semantic interpretation), and those which are uninterpretable (and hence play no role in semantic interpretation). For example, it seems clear that the case feature of a pronoun like THEY is uninterpretable, since a subject pronoun surfaces as
nominative, accusative or genitive depending on the type of [bracketed] clause it is in, without any effect on meaning – as the examples in (10) below illustrate:

(10)(a) It is said [they were arrested]
(b) He expected [them to be arrested]
(c) He was shocked at [their being arrested]

By contrast, the (person/number/gender) \( \phi \)-features of pronouns are interpretable, since e.g. a first person singular pronoun like I clearly differs in meaning from a third person plural pronoun like they, and a masculine pronoun like he differs in meaning from a feminine pronoun like she. We can illustrate the interpretable and uninterpretable features carried by auxiliaries (or, more abstractly, finite T constituents) in terms of the sentences below:

(11)(a) She is working/She was working
(b) He is writing the assignment/He has written the assignment
(c) He insists that she is respected/He insists that she be respected
(d) They are working/*They am working

The choice of tense feature on the auxiliary is/was determines whether the sentence is interpreted as describing a present or past state of affairs, and so tense is clearly an interpretable feature. Likewise, the choice between the progressive auxiliary is and the perfect auxiliary has in (11b) determines whether the sentence is interpreted as describing an action which is in progress or one which is completed, and so aspect is also an interpretable feature of the auxiliary. In much the same way, the choice between the indicative auxiliary is and its subjunctive counterpart be in (11c) determines whether the sentence is interpreted as describing a realis (i.e. existing) state of affairs or an irrealis one (i.e. one which does not exist at present but which may exist in the future), and so mood must also be an interpretable feature of auxiliaries. By contrast, the (person/number) \( \phi \)-features of auxiliaries are uninterpretable, in that they serve purely to mark agreement with a particular nominal: consequently, if we replace the third person plural T-auxiliary are by the first person singular form am in a sentence like (11d) with a third person plural subject, we do not change the meaning of the sentence but rather simply make it ungrammatical.

We can summarise the picture which we get from sentences like (10) and (11) above in terms of the table in (12) below:

<table>
<thead>
<tr>
<th>Type of constituent</th>
<th>Interpretable features include</th>
<th>Uninterpretable features include</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auxiliary (T-constituent)</td>
<td>Tense, aspect and mood</td>
<td>Person and number</td>
</tr>
<tr>
<td>Pronoun or noun expression</td>
<td>Person, number and gender</td>
<td>Case</td>
</tr>
</tbody>
</table>

As we saw in the simplified model of grammar which we presented in §1.3, each structure generated by the syntactic component of the grammar is subsequently sent to the PF component of the grammar to be spelled out (i.e. assigned a PF representation which provides a representation of its Phonetic Form). If we assume that unvalued features are illegible to (and hence cannot be processed by) the PF component, it follows that every unvalued feature in a derivation must be valued in the course of the derivation, or else the derivation will crash (i.e. fail) because the PF component is unable to spell out unvalued features: in the words of Chomsky (2006, p.13) ‘If transferred to the interface unvalued, uninterpretable features will cause the derivation to crash.’ In more concrete terms, this amounts to saying that unless the syntax specifies whether we require e.g. a first person singular or third person plural present-tense form of BE, the derivation will crash because the PF component cannot determine whether to spell out BE as am or are.

In addition to being sent to the PF component, each structure generated by the syntactic component of the grammar is simultaneously sent to the semantic component, where it is converted into an appropriate semantic representation. Clearly, interpretable features play an important role in computing semantic representations. Equally clearly, however, uninterpretable features play no role whatever in this process: indeed, since they are illegible to the semantic component, we need to devise some way of ensuring that uninterpretable features do not input into the the semantic component. How can we do this?

The answer suggested in work by Chomsky over the past decade is that uninterpretable features are deleted in the course of the derivation, and thereby become invisible to the syntactic and semantic
components (while remaining visible to the PF component). But how? As a first approximation (to be slightly revised in terms of the Completeness Condition in (67) subsequently), let us suppose that Feature Deletion works along the lines sketched informally below:

(13) **Feature Deletion**

An uninterpretable feature is deleted immediately any operation it is involved in applies, and is thereafter invisible in the syntactic and semantic components (but visible in the PF component).

By saying that a feature becomes invisible in the syntax once it is deleted, we mean that it becomes inactive: for example, an EPP feature can no longer trigger movement once deleted, and a pronoun which has been assigned case cannot subsequently be assigned another case. In this connection, consider the case-marking of the italicised subject of the bracketed complement clause in the sentences below:

(14)(a) They believe [John to be lying]

(b) They believe [John is lying]

In (14a), the complement-clause subject John is not assigned case by any constituent internally within its own clause, and so can receive exceptional accusative case from the transitive verb believe in the higher clause – as we see from They believe him to be the best candidate. But in (14b), John is assigned nominative case by the finite T-constituent is within its own clause, and consequently (given (13) above) is inactivated for further case/agreement operations at that point, and so cannot subsequently be assigned accusative case by the verb believe – as we see from the ungrammaticality of *They believe him is innocent.

In the light of our informal characterisation of Feature Deletion in (13) above, let’s re-consider how Agreement applies in a structure like (6) above, repeated as (15) below (though with the addition of the uninterpretable EPP feature on T):

(15)                      T′
            T
        BE
       [Past-Tns]  V
         [u-Pers] arrested  PRN
               [u-Num]
       [EPP]

The agreement features of the probe BE are valued as third-person, plural-number via the φ-feature valuation suboperation (7i); the case feature of the goal THEY is valued as nominative via the case valuation suboperation (7ii); and the EPP feature on T triggers movement of the goal THEY to spec-T. But at the same time as these operation apply, the Feature Deletion operation in (13) also applies, concomitantly deleting the uninterpretable (italicised) person, number and EPP features on the probe, and the uninterpretable (italicised) case-feature on the goal. The result of all these various operations applying simultaneously is to derive the structure in (16) below (where items are shown in their spellout forms, and the structure is simplified by showing the original occurrence of THEY as *they*):

(16)                       TP
              PRN
  they
       [3-Pers]
   [Pl-Num]
  [Nom-Case]

               T′
          T
      BE
     [Past-Tns]  V
       [3-Pers] arrested  they
               [Pl-Num]
       [EPP]

In accordance with (13), the deleted uninterpretable features will be invisible in the semantic and syntactic components – hence they and were will be inactive for further operations which involve case or agreement.
features (e.g., agreement, case assignment, and A-movement). However, the deleted features will remain visible in the PF component: accordingly, the PF component can ‘see’ the deleted [nominative-case] feature on the pronoun THEY and so spells out the pronoun in the nominative form *they*; likewise, the PF component can ‘see’ the deleted [third-person, plural-number] features on the T-constituent BE, and so spells it out as the third-person-plural form *were*.

An interesting complication which arises from our assumption in (13) that uninterpretable features are deleted once they have ‘done their work’ is the following. If case-marking were to apply before agreement or movement in (15) above, the uninterpretable case-feature on the pronoun *they* would be inactivated, and the pronoun would then no longer be active for agreement or movement. One way of getting round this problem is to suppose that agreement, case-marking, A-movement and feature-deletion all apply simultaneously on the T-cycle in (15), and to assume that this is the consequence of a more general condition such as (17) below:

(17) **Simultaneity Condition**
All syntactic operations which apply on a given cycle apply simultaneously

And indeed we shall assume (17) for the time being (though we will revisit this issue in chapter 9). In a fairly obvious sense, (17) follows from the **Earliness Principle**, in the sense that e.g. if all (case and agreement) feature-valuation, feature-deletion and agreement operations which apply on the T-cycle apply as early as possible, they will apply simultaneously.

### 7.5 Expletive *it* subjects

So far, all the constructions we have looked at have involved a finite T agreeing with a noun or pronoun expression which carries interpretable person/number ϕ-features. However, English has two **expletive pronouns** which (by virtue of being non-referential) carry no interpretable ϕ-features. One of these is expletive *it* in sentences such as:

(18)(a) *It* is said that he has taken bribes
(b) *It* can be difficult to cope with long-term illness
(c) *It’s* a pity that she can’t come
(d) *It’s* a long way from here to Lands End

The pronoun *it* in sentences like these appears to be an **expletive**, since it cannot be replaced by a referential pronoun like *this* or *that*, and cannot be questioned by *what*. Let’s examine the syntax of expletive *it* by looking at the derivation of a sentence like (18a).

If (as we did in our earlier discussion of (3) above) we follow Chomsky (1999) in assuming that expletive pronouns are directly merged in spec-T, the main clause in sentence (18a) will be derived as follows. The (passive participle) verb *said* is merged with its CP complement *that he has taken bribes* to form the VP *said that he was taking bribes*. Merging this VP with the tense auxiliary BE forms the structure shown in simplified form below:

(19)

```
T
  \-----
  |    |  VP
  |    |  BE
  |\----/    
 [Pres-Tns] V CP
   [u-Pers] said that he has taken bribes
   [u-Num]
```

In accordance with Pesetsky’s **Earliness Principle**, we might expect T-agreement to apply at this point. Accordingly, the probe BE (which is active by virtue of its uninterpretable person/number ϕ-features) searches for an active goal to value its unvalued ϕ-features. It might at first sight seem as if the CP headed by *that* is an appropriate goal, and is a third person singular expression which can value the person/number features of BE. However, it seems unlikely that such clauses have person/number features. One reason for thinking this is that even if the *that*-clause in (19) is coordinated with another *that*-clause as in (20) below, the verb BE remains in the singular form *is*:

(20) *It* is said [*that he has taken bribes* and *that he has embezzled company funds*]
If each of the italicised clauses in (20) were singular in number, we would expect the bracketed coordinate clause to be plural (in the same way as the co-ordinate structure John and Mary is a plural expression in a sentence like John and Mary are an item): but the fact that the passive auxiliary is remains singular in (20) suggests that the CP has no number properties of its own. Nor indeed does the that-clause in (20) have an unvalued case-feature which could make it into an active goal, since that-clauses appear to be caseless (as argued by Safir 1986), in that a that clause cannot be used in a position like that italicised in (21) below where it would be assigned accusative case by a transitive preposition such as of:

(21) There have been reports of bribery/*of that he has taken bribes

If the CP in (19) has no uninterpretable case feature, it is inactive and so cannot value the φ-features of BE.

However, a question we might ask about (19) is whether BE could instead agree with the subject of the that-clause, namely *he: after all, he enters the derivation with an uninterpretable case-feature (making it active), and so is a third person singular expression and so could seemingly value the unvalued person and number features of BE. Yet it is clear that BE does not in fact agree with *he, since if we replace he by the first person plural subject we, BE still surfaces in the third person singular form is – as in (22) below:

(22) It is said [CP that [TP we have taken bribes]]

Something, then, must prevent BE from agreeing with we – but what? The answer is that by the time we have reached the stage of derivation in (19), the case feature on *we has already been valued as nominative and deleted, and so is invisible to other probes (and hence inactive) at this point – cf. (13) above.

Consequently, BE cannot agree with *we in (22) – and by the same token, BE cannot agree with *he in (19).

So far, what we have established in relation to the structure in (19) is that BE cannot agree with the CP headed by the complementiser that because that is inactive and has no φ-features or case-feature; nor can BE agree with *he, because the case feature on *he has been valued and deleted and so is inactive at this point. It is precisely because BE cannot agree with CP or with any of its constituents that expletive it has to be used, in order to value the φ-features of T and to satisfy the EPP feature on T requiring it to have a subject of its own. In keeping with the Minimalist spirit of positing only the minimal apparatus which is conceptually necessary, let’s further suppose that expletive it has ‘a full complement of φ-features’ (Chomsky 1998, p.44) but that (as Martin Atkinson suggests) these are the only features it carries. Now, while it clearly carries an interpretable (neuter/inanimate) gender feature when used as a referential pronoun (e.g. in a sentence like This book has lots of exercises in it, where it refers back to this book), it has no semantic interpretation in its use as an expletive pronoun, and so can be assumed to carry no interpretable gender feature in such a use. The reason for positing that expletive it is a caseless pronoun is that it is already active by virtue of its uninterpretable φ-features, and hence does not ‘need’ a case-feature to make it active for agreement (unlike subjects with interpretable φ-features). Some suggestive evidence that expletive it may be a caseless pronoun comes from the fact that it has no genitive form its – at least for speakers like me who don’t say *He was annoyed at its being claimed that he lied.

If our reasoning in the previous paragraph is along the right lines, expletive it enters the derivation carrying the features [third-person, singular-number]. Since expletive it is a ‘meaningless’ expletive pronoun, these features will be uninterpretable. Given this assumption, merging it as the specifier of the T-bar in (16) above will derive the structure (23) below (with interpretable features shown in bold, and uninterpretable features in italics):

(23)  

Chomsky (1999) suggests that expletive it can serve as a probe (active by virtue of its uninterpretable person/number features) which locates the T-auxiliary BE as a suitable goal (active by virtue of is uninterpretable and unvalued person/number features). If this is so, agreement between the two will lead
to valuation of the unvalued person/number features on BE, and deletion of the uninterpretable person/number features on both BE and it.

However, such an account of expletive structures is problematic from a theoretical perspective. For one thing, a probe is typically the head of a phrase (and hence a minimal projection), whereas it in (23) is a specifier (and hence a maximal projection). Moreover, agreement (e.g. in a structure like (16) above) typically involves a goal valuing unvalued person/number features on a probe, whereas under the account offered above, agreement in (23) involves the converse situation of a probe valuing person/number features on a goal. The conclusion we reach is thus that an expletive ‘can’t be a probe’ (Noam Chomsky, pc. 5 June 2005) and that having an expletive as a probe is ‘an option barred under narrower… conceptions of the role of the probe in controlling operations’ (Chomsky 2006, p.6). Consequently, BE must be the probe in (23) and expletive it the goal. However, given the assumption that a probe can only agree with a goal which it c-commands, it follows that the expletive goal it cannot be directly merged in spec-T, because if so it would not be c-commanded by the probe BE, and agreement would not be able to apply – with the result that the derivation would crash (because unvalued features would not be valued, and uninterpretable features would not be deleted), and sentence (22) would wrongly be predicted to be ungrammatical. Since a goal must occupy a lower position than its probe, the conclusion we reach is thus that expletive it must originate in a position below the T-auxiliary BE. But where?

Bearing in mind that the core assumption of the VP-Internal Subject Hypothesis outlined in §6.2 is that subjects originate within VP and subsequently raise from their original position within VP into the specifier position within TP, a plausible suggestion is that expletive pronouns likewise originate internally within VP, and subsequently raise to the subject/specifier position within TP. In this connection, compare the following pair of sentences:

(24)(a) They had said that he was taking bribes
(b) I won’t have it said that he was taking bribes

In (24a), said is an active perfect participle, and the specifier position within the VP headed by said is occupied by the external argument of the verb said (namely its subject they). However, said in (24b) is a passive participle form of the verb, and it is a property of passive verbs that they project no external argument, with the result that the specifier position is free to be occupied by an expletive. In (24b), expletive it appears immediately in front of (and hence can be plausibly be taken to originate as the specifier of) the passive participle said.

Let us therefore suppose that in sentence (18a) It is said that he has taken bribes, the expletive pronoun it originates in spec-V. This means that the main clause in (18a) will be derived as follows. The passive participle said merges with its CP complement that he was taking bribes to form the V-bar said that he was taking bribes. This V-bar is then merged with the expletive pronoun it, deriving the VP it said that he was taking bribes. The resulting VP merges with a present-tense T constituent containing the passive auxiliary BE, so deriving the structure shown in simplified form below:

(25)                                       T'   VP
                             [Pres-Tns] BE
                                            [u-Pers] PRN it
                                            [u-Num] [3-Pers] V CP
                                            [EPP] [Sg-Num] said that he was taking bribes

At this point, BE can serve as an active probe which locates the c-commanded expletive pronoun it as an active goal (both BE and it being active by virtue of their uninterpretable person/number features). Via Agreement (7), the goal it values the unvalued person/number features on the probe BE. At the same time as Agreement applies, the EPP feature on the T-auxiliary BE attracts the goal it to move to spec-T. Feature Deletion (13) results in deletion of the uninterpretable person/number features on both probe and goal, and of the EPP feature on the probe. Simultaneous application of agreement, case-marking, movement and deletion thus derives the structure in (26) below:
The resulting structure (26) is subsequently merged with a null C constituent carrying an interpretable declarative-force feature. Since the initially-unvalued person/number features on \(BE\) have been valued, and all uninterpretable features on both \(BE\) and \(it\) have been deleted, the relevant derivation converges. Given that deleted features remain visible in the PF component, the T-auxiliary \(BE\) will be spelled out as the third person singular present tense form \(is\).

7.6 Expletive \(there\) subjects

Having looked at the syntax of expletive \(it\) in the previous section, we now turn to look at expletive \(there\). As a starting point for our discussion, we’ll go back to the very first sentence we looked at in this chapter, namely (1) \(There\ were\ awarded\ several\ prizes\). However, given the conclusion we reached in the previous section that expletives originate internally within VP, our earlier analysis in (3) above (which assumed that expletive \(there\) originates in spec-T) will now have to be revised along the following lines. The (passive participle) verb \(awarded\) merges with the QP complement \(several\ prizes\) to form the V-bar \(awarded\ several\ prizes\). This V-bar is then merged with the expletive pronoun \(there\) to form the VP \(there\ awarded\ several\ prizes\). Let’s assume that (like expletive \(it\)), expletive \(there\) carries no case feature (and hence has no genitive form, as we see from the ungrammaticality of *She\ was\ upset\ by\ there’s\ being\ nobody\ to\ help\ her\). Let’s also follow Chomsky (1998, 1999, 2001) in positing that the only feature carried by expletive \(there\) is an uninterpretable person feature, and let’s further suppose that \(there\) is intrinsically third person (consistent with the fact that a number of other words beginning with \(th\)- are third person – e.g. \(this\), \(that\), \(these\), \(those\) and \(the\)). Given these (and earlier) assumptions, the VP headed by he passive participle \(awarded\) will have the following structure:

(27)

\[
\begin{array}{c}
\text{PRN} \\
\text{there} \\
[3-Pers] \\
V \\
awarded \\
\text{QP} \\
\text{several\ prizes} \\
[3-Pers] \\
[Pl-Num] \\
[u-Case]
\end{array}
\]

A question which arises at this juncture is whether the uninterpretable person feature on \(there\) can be deleted via agreement with the φ-complete QP \(several\ prizes\). The answer is: ‘No’, because there is no probe-goal agreement relation between \(there\) and \(several\ prizes\). There are two reasons why \(there\) cannot agree with \(several\ prizes\). For one thing, \(there\) is not the head of a phrase (and so is not a minimal projection), and hence cannot serve as a probe: rather, \(there\) is a specifier (and maximal projection) and hence can only serve as a goal, not as a probe. Secondly, agreement typically involves a relation between a valued feature on one member of a probe-goal pair and a matching unvalued feature on the other (with the unvalued feature being valued via agreement); but since \(there\) and \(several\ prizes\) both enter the derivation valued as [third-person], there cannot in principle be any agreement relation between them. Consequently, agreement cannot apply at the stage of derivation in (27).

The derivation therefore continues by merging the VP already formed in (28) with a past tense T constituent containing the passive auxiliary \(BE\) will derive the structure shown in simplified form below:
(28)  

Given the **Earliness Principle**, Agreement and Case Assignment will apply at this point in the derivation. Because BE is the head of the overall structure (and is active by virtue of its uninterpretable person and number features) it serves as a probe which searches for one or more active goals. It locates two such goals: one is *there* (which is active by virtue of its uninterpretable person feature); the other is the QP *several prizes* (which is active by virtue of its uninterpretable case feature). Let’s suppose (following Chomsky 2001, 2005b) that when a probe locates more than one active goal, it undergoes simultaneous **multiple agreement** with all active goals accessible to it. Accordingly, via the φ-feature valuation suboperation (7i), the T-probe BE agrees in person with both goals (the third-person expressions *there* and *several prizes*) and the unvalued person feature on BE is accordingly valued as third person. However, BE also agrees in number with the plural expression *several prizes*, and so the unvalued number feature on BE is valued as plural. At the same time, the unvalued case feature on the goal *several prizes* is valued as nominative by the finite T-probe, in accordance with the case-valuation suboperation (7ii) above. The [EPP] feature on T attracts the closest goal, and so triggers movement of *there* to spec-T. In accordance with the Feature Deletion (13), the uninterpretable person and number features on BE, the uninterpretable case-feature on *several prizes* and the uninterpretable EPP feature on BE are deleted. Simultaneous application of agreement, case-marking, movement and deletion thus derives the structure shown below (where outline font marks a copy which receives a null spellout in the PF component):

(29)  

The resulting TP is then merged with a null C carrying an interpretable declarative force feature. Since all features are valued, the derivation converges at the PF interface; since all uninterpretable features have been deleted, it also converges at the semantics interface.

Our assumption that T in (28) undergoes multiple agreement with both the expletive goal *there* and the non-expletive goal *several prizes* and that *there* is intrinsically third person carries with it the tacit implication that the non-expletive goal must likewise be a third person expression, if we make the plausible assumption that a probe cannot agree in person with multiple goals which have different person properties (because this will lead to a feature mismatch). Such an assumption accounts for contrasts like:

(30)(a)  Only I am suspected of cheating  
(b)  *There am/is only I suspected of cheating
In (30a), the only goal for the T-probe \( \text{BE} \) is the first person singular expression \( \text{only I} \), and consequently \( \text{BE} \) can agree with this (single) goal and thereby be marked as first person singular. But in (30b), \( \text{BE} \) has two goals which it must agree with – namely the first person singular expression \( \text{only I} \) and the third person expletive \( \text{there} \). If \( \text{BE} \) agrees in person and number with \( \text{only I} \), it will be marked as first person singular and ultimately be spelled out as \( \text{am} \); but this will mean that \( \text{am} \) does not agree in person with \( \text{there} \). On the other hand, if \( \text{BE} \) agrees in person with \( \text{there} \) and in number with \( \text{only I} \), it will be marked as third person singular and ultimately be spelled out as \( \text{is} \); but this will mean that \( \text{is} \) does not agree in person with \( \text{only I} \). Since there is no way of resolving this feature mismatch, (30b) is ungrammatical. (On structures like \( \text{There's lots of people in the room} \), see Sobin 1997, Schütze 1999, and den Dikken 2001.)

An important question to ask in the context of our discussion of expletive \( \text{it} \) in the previous section and expletive \( \text{there} \) in this section is what conditions govern the use of expletives. We can give an informal characterisation of the relevant conditions in the following terms:

(31) **Expletive Conditions**

(i) **External Argument Condition:**

An expletive can only be merged as the highest argument of a verb with no external argument

(ii) **Indefiniteness Condition:**

Expletive \( \text{there} \) can only be merged with a verb which has an indefinite nominal or pronominal internal argument

(iii) **Inactivity Condition**

Expletive \( \text{it} \) can only be merged with a constituent which does not contain a nominal or pronominal expression with active case- or \( \phi \)-features

The conditions in (31) provide us with a basis to account for contrasts such as the following:

(32)(a) **There** was awarded only one prize  (b) \*It was awarded only one prize

(33)(a) **It** is said that he has taken bribes  (b) \*There is said that he has taken bribes

(34)(a) \***There** was impeached the president  (b) \*It was impeached the president

Sentences (32a) and (32b) both satisfy the External Argument Condition (31i) because the verb \( \text{arrested} \) is a passive participle with no external argument: (31a) also satisfies the Indefiniteness Condition (31ii) because the italicised associate of \( \text{there} \) is an indefinite expression; by contrast, (32b) violates the Inactivity Condition (31iii) because the italicised associate of \( \text{it} \) is the QP \( \text{only one prize} \) and this is active by virtue of its uninterpretable case feature. Sentences (33a) and (33b) both satisfy the External Argument Condition (31i) because the verb \( \text{said} \) is a passive participle with no external argument: (33a) also satisfies the Inactivity Condition (31iii) because the italicised associate of \( \text{it} \) is a clause whose head C \( \text{that} \) carries no active person/number/case feature (nor are any of the constituents of the \( \text{that} \)-clause active, their uninterpretable features having been valued and deleted at an earlier stage of derivation); but (33b) violates the Indefiniteness Condition (31ii) because the italicised associate of \( \text{there} \) is not an indefinite noun or pronoun expression. Sentences (34a) and (34b) both satisfy the External Argument Condition (31i) because the verb \( \text{impeached} \) is a passive participle with no external argument: (34a) violates the Indefiniteness Condition because the italicised associate of \( \text{there} \) is not an indefinite expression but rather the definite DP \( \text{the president} \); and (34b) violates the Inactivity Condition because the italicised associate of \( \text{it} \) is the DP \( \text{the president} \) and this is active by virtue of its uninterpretable case feature. The only grammatical outcome for a structure in which a passive participle has a definite DP complement in English is not to use an expletive but rather to passivise the complement – as in \( \text{The president was impeached} \). So, we see that the conditions in (31) provide a descriptively adequate account of the syntax of expletives (but see Bowers 2002 for an alternative account of the \( \text{there}/\text{it} \) distinction). Incidentally, note that an interesting consequence of the Inactivity Condition (31iii) is that a weather verb like \( \text{rain} \) which has no thematic argument will require use of expletive \( \text{it} \); and given the highest argument condition in (31i), \( \text{it} \) will originate as the highest (and only) argument of the verb \( \text{rain} \), in the same VP-complement position as an accusative subject (with \( \text{it} \) subsequently raising to spec-T and yielding a structure like \( \text{It is raining it} \), with strikethrough marking the initial position of \( \text{it} \)).

However, the conditions in (31) are essentially descriptive stipulations which have no explanatory force. The question we need to ask therefore is \( \text{why} \) such conditions should obtain. Consider first the
External Argument Condition (31i). If we suppose that a verb phrase can only have a single specifier and that the italicised external argument of the verb in a transitive structure like (35a) below originates as the specifier for the verb, then it follows that the verb cannot also have an expletive specifier like that bold-printed as in (35b):

(35)(a) A spokesman for the president has denied allegations of impropriety
(b) *There has a spokesman for the president denied allegations of impropriety

An alternative possibility is to follow Felser and Rupp (2001, p.312) in analysing an expletive as ‘a thematic or quasi-thematic subject’, so that ‘the expletive is characterised as an argument expression’. More specifically, they maintain (ibid.) that expletive there ‘is thematic without referring to an actual participant or event depicted – rather, in the spirit of Kratzer (1995), we may take it to be associated with an abstract location.’ If an expletive is ‘the last argument to be added’ in a derivation (Felser and Rupp 2001, p.314), it follows that (in a sentence like There occurred several unfortunate incidents), the expletive will be merged in spec-V: thus, the QP several unfortunate incidents will be the first argument to be merged with the verb occur (as its complement), and the expletive there the second argument (as the specifier of occur). We should also note in passing that expletive it also has some argument-like properties, e.g. in being able to serve as the antecedent of PRO in sentences like It can be difficult to achieve one’s goals without PRO being impossible.

The question of why the Inactivity Condition in (31iii) should hold also seems to have a relatively straightforward answer: given that VP is merged as the complement of T, and a finite T carries agreement features which require it to agree with an active constituent within VP, we can see the function of using expletive it in a structure which would otherwise lack a goal which is active for agreement as being to provide an active goal which can value unvalued person/number features on a T-probe – as was implicit in our earlier discussion of sentences like (18a) It is said that he has taken bribes. Moreover, given the assumption that (in consequence of the Economy Condition) an active head probes only as far as it needs to in order to satisfy its requirements, we can see why expletive it cannot be used in a structure like (32b) *It was awarded only one prize: this is because if it is merged as the specified of the verb awarded, the T-constituent BE will agree in person and number with the closest φ-complete goal it, so leaving the case feature on only one prize unvalued and undeleted, and thereby causing the derivation to crash.

What remains to be accounted for is the Indefiniteness Condition (31ii). This condition raises two questions: firstly, why an expletive should be used at all, and secondly why (if one is used) it has to be there and not it. Let’s look at each of these questions in turn. Use of an expletive in association with an indefinite internal argument may well be motivated by semantic considerations. A number of linguists (including Milsark 1974, 1977; Jenkins 1975; Diesing 1992; Groat 1995; Felser and Rupp 2001) have observed that indefinites which move to spec-T are ambiguous between a specific and a non-specific reading, whereas indefinites which remain in situ within VP in expletive structures allow only a non-specific reading – as illustrated by the contrast below:

(36)(a) A man is in the room     (b) There is a man in the room

Groat (1995, p.355) notes that while a man in (36a) can have either a specific or a non-specific interpretation, in (36b) it can only have a non-specific interpretation. This suggests that the use of an expletive pronoun in sentences like (36b) is a device for ensuring that the associated indefinite expression does not receive a specific interpretation.

However, this still leaves us with the question of why there rather than it should be the expletive pronoun used in conjunction with an indefinite internal argument. The answer we shall suggest here is that the choice of pronoun in an expletive structure is determined by the Economy Condition, in the sense that economy considerations dictate that (in expletive structures) we use an expletive carrying as few uninterpretable features as possible. Since there carries only one uninterpretable feature (its third-person feature) and it carries two (its third-person and singular-number features), what this means in practical terms is that there will be used wherever possible, with it only being used when use of there results in ungrammaticality.

We can illustrate how the economy account works by considering why there is used rather than it in sentences with an indefinite associate like (32a) There was awarded only one prize. Given the assumptions made here, (32a) will be derived as follows. The passive verb awarded merges with its indefinite complement only one prize to from the V-bar awarded only one prize. This is then merged with expletive
there to form the VP *there awarded only one prize*. The resulting VP is then merged with a past tense T constituent containing the passive auxiliary BE, so deriving the structure shown below:

(37)  
```
T'                        
/  
T  VP                         
/    
BE [Past-Tns]  PRN          V'          QP 
[3-Pers]                   [EPP]        [3-Pers]    
[u-Pers] there             awarded only one prize    [Sg-Num]     
[u-Num] [EPP] [u-Case]  
```

The active T-probe BE locates two active goals within its search space – namely the expletive pronoun *there* (active by virtue of its uninterpretable person feature) and the QP *only one prize* (active by virtue of its uninterpretable case feature). Four things then happen at the same time: (i) BE agrees in person with *there*, and in person and number with *only one prize*; (ii) the unvalued case feature on *only one prize* is valued as nominative; (iii) the EPP feature on T triggers movement of the closest goal (= expletive *there*) to spec-T; and (iv) all uninterpretable features on the probe and goals are deleted. The result of these four operations is to derive the structure in (38) below:

(38)  
```
TP                                      
/  
PRN there T' VP                         
/    /    
[3-Pers] [Past-Tns] V' QP              
[3-Pers] [EPP] [Nom-Case]             
[u-Pers] [3-Pers] [Sg-Num]        [EPP] 
[u-Num] [u-Case] awarded only one prize [EPP] [Nom-Case] 
```

The resulting TP is subsequently merged with a null C containing an uninterpretable declarative force feature. The resulting derivation converges both at the PF interface (because all features have been valued) and at the semantics interface (because all uninterpretable features have been deleted). Since use of expletive *there* in (38) leads to convergence, economy considerations rule out the use of expletive *it* in structures with an indefinite associate (because *it* is more ‘costly’ to use by virtue of having two uninterpretable features which need to be deleted).

But now consider why expletive *it* (but not expletive *there*) is used in a sentence like (18a) above, repeated as (39a) below:

(39)(a) *It* is said that he has taken bribes  (b) *There* is said that he has taken bribes

The main clause in each of the sentences in (39) will be derived by merging the verb *said* with its that-clause complement to form the V-bar *said that he has taken bribes*, and then merging this V-bar with the expletive pronoun *it or there*. The resulting VP is then merged with a present-tense T-constituent containing the progressive auxiliary BE, so forming the T-bar in (40) below:
If the expletive used is *there*, the unvalued and uninterpretable person feature on *BE* can be valued via agreement with *there*, but not the unvalued and uninterpretable number feature on *BE*. The result is that the derivation crashes, and the corresponding sentence (39b) is ungrammatical. Because use of the more economical expletive *there* would cause the derivation to crash, expletive *it* is used instead: agreement between the probe *BE* and the expletive goal *it* in (40) will both value and delete the unvalued person/number features on *BE*, and delete the uninterpretable person/number features on *it*. The resulting sentence (39a) is therefore correctly predicted to be grammatical.

### 7.7 Agreement and A-movement

So far, we have seen that agreement plays an important role not only in valuing the φ-features of T but also in valuing the case-features of nominalis. Chomsky (1998, 1999, 2001) goes further and suggests that agreement also plays an important role in A-movement. To see why, let’s return to consider the derivation of our earlier sentence (5b) *They were arrested*. Assume that the derivation proceeds as sketched earlier until we reach the stage of derivation in (15) above, repeated as (41) below:

![Diagram](41)

In (41), [T BE] is an active probe (by virtue of its uninterpretable person and number features) and has an uninterpretable EPP feature. It therefore searches for active nominal goals which can value and delete its person/number features, locating the pronoun *THEY* (which is active by virtue of its uninterpretable case feature and which has person and number features that match those of BE). Since the matching goal *THEY* is a definite pronoun, the EPP feature of [T BE] cannot be deleted by merging an expletive in spec-TP, but rather can only be deleted by movement of the goal to spec-TP: accordingly, *THEY* moves to become the specifier of *BE*. Assuming that agreement, case marking and feature deletion work as before, the structure which is formed at the end of the T-cycle will be that shown below:

![Diagram](42)

(To avoid excessive visual clutter, the trace copy of *they* left behind in VP-complement position is shown here simply as *they*, but is in fact an identical copy of *they*, containing the same features as *they*. The same
A key assumption underlying the analysis sketched here is that T triggers movement of a nominal goal with which it agrees in person/number. In a passive sentence like (5B) *They were arrested*, the nominal which agrees with T and which moves to spec-T is the thematic complement of the verb *arrested*. But in an active sentence like:

(43)  He has arrested them

it is the subject *he* which agrees with T and moves to spec-T, and not the complement *them*. Why should this be? In order to answer this question, let’s look at how (43) is derived.

The verb *arrested* merges with its THEME complement *them* to form the V-bar *arrested them*. This V-bar is in turn merged with its AGENT argument *he* to form the VP *he arrested them*. The resulting VP is then merged with a present-tense T constituent to form the T-bar shown in simplified form below:

(44)                             T
   HAVE
   VP
   PRN  he
   V    PRN  them
   arrested

T serves as a probe at this point and looks for a goal to value (and delete) its unvalued person/number features. However, if (as we assumed in our discussion of the passive structure in (42) above) T can agree with the complement of a verb, an important question to ask is why T can’t agree with the complement *them* in an active structure like (44), and why in fact HAVE must agree with the subject *he* and hence is ultimately spelled out as the third person singular present-tense form *has*.

The answer is that (by the time we reach the stage of derivation in (44) above), the pronoun *them* will already have had its case-feature valued (as accusative) and deleted, and so will no longer be active for case/agreement operations. If all structural case assignment involves agreement (as tacitly assumed in (7) above), it follows that accusative case assignment will involve the kind of operation outlined informally below:

(45)  Accusative Case Assignment

An unvalued case feature on a goal is valued as accusative via agreement with a transitive probe

Agreement between a transitive verb and its object is invisible in English (in the sense that it has no overt phonetic manifestation), but is visible in languages like Swahili with overt object-agreement morphology. Given the Earliness Principle, the pronoun *them* in (44) will have had its case feature valued as accusative (and deleted) via agreement with the transitive verb *arrested* on the V-cycle, and so be inactive for subsequent case/agreement operations by the time we reach the T-cycle in (44) above. Consequently, when the T-probe HAVE searches for a goal in (44), the only active goal (with an unvalued case feature) which it locates is the pronoun *he*. Accordingly, HAVE agrees with, assigns nominative case to, and attracts movement of *he* to spec-T, so forming a TP whose overt constituents are *He has arrested them*. Merging the resulting TP with a null declarative complementiser derives the structure associated with (43) *He has arrested them*.

7.8 EPP and agreement in control infinitives

The analysis presented in the previous section assumes that a finite T carries an EPP feature which (in conjunction with agreement) drives A-movement. But what about the kind of infinitival [T to] constituent found in control clauses? In the previous chapter, we argued that infinitival to in a control clause like that bracketed in (46a) below has an EPP feature which attracts PRO to move out of the VP in which it originates into spec-TP in the manner indicated by the arrow in (46b):
(46)(a) They don’t want [to see you]
      (b) They don’t want [CP [TP PRO [T to] [VP PRO [V see] you]]]

Let us follow Chomsky (1998, 1999, 2001) in positing that control to has an EPP feature triggering raising of PRO to spec-T. Let’s also follow Chomsky in positing that PRO is assigned null case by agreement with a c-commanding T with null (non-finite) tense in much the same way as subjects in tensed clauses are assigned nominative case by agreement with a c-commanding T which has finite (present or past) tense. More specifically, let’s assume that to in control infinitives contains not only an abstract non-finite tense feature, but also abstract φ-features; and let’s further suppose that null case assignment can be characterised informally as follows:

(47) **Null Case Assignment**

An unvalued case feature on a pronoun goal is valued as null via agreement with a T-probe carrying null (non-finite) tense.


In the light of these assumptions, consider the derivation of the bracketed control clause in:

(48) They have decided [PRO to help you]

*Decide* is a control predicate (as we see from the fact that (48) is paraphrasable as *They have decided that they will help you*, and from the fact that *decide* does not allow an expletive subject in a sentence like *There has decided to be an enquiry*). Given the VP-Internal Subject Hypothesis, the PRO subject of the bracketed infinitive clause will originate in spec-V, as the specifier of *help you*. More specifically, the derivation proceeds as follows. The verb *help* merges with its complement *you*, and the resulting V-bar *help you* in turn merges with its PRO subject to form the VP *PRO help you*. Merging control to with this VP forms the TP *PRO help you*. Let’s suppose that since PRO refers back to they in (48), PRO (as used here) carries the interpretable features [3-Pers, Pl-Num]; let’s also suppose that PRO enters the derivation with an unvalued case feature [u-Case]. In addition, let’s assume that control to carries an interpretable nonfinite-tense feature [Nf-Tns] (denoting an irrealis event which has not yet happened but may happen in the future), and also has uninterpretable (and unvalued) person/number features. Finally (for the reasons given in §6.9), let’s assume that to carries an EPP feature in control clauses. Given all these assumptions, merging to with [vp PRO help you] will form the T-bar (49) below (simplified by showing only features on constituents of immediate concern to us):

(49)

```
(49)                         T'
                          T
                        [Nf-Tns]       [u-Pers]
                    [u-Num]  PRN  PRO  [3-Pers]
                    [EPP]     [Pl-Num]  V  [u-Case]
                      help  you
                  PRN
```

Since to is the highest head in the structure and is active (by virtue of its uninterpretable φ-features), it serves as a probe which searches for a goal to value and delete its φ-features. Since to c-commands PRO and PRO is active by virtue of its uninterpretable case feature, PRO can serve as a goal for the probe to. The unvalued φ-features on the probe are assigned the same third person plural values as those on the goal by Agreement (7) and are deleted by Feature Deletion (13). The unvalued case-feature on PRO is assigned the value [Null-Case] by Null Case Assignment (47) and deleted by Feature Deletion (13). The EPP feature of to is deleted by movement of PRO to spec-T. The result of applying these various operations is to derive the TP shown in simplified form in (50) below:
The resulting TP is subsequently merged with the null nonfinite complementiser which introduces control clauses. As required, the structure which will serve as input to the semantic component contains only (bold-printed) interpretable features – all uninterpretable features having been deleted.

### 7.9 EPP and person agreement in defective clauses

In §7.7 we suggested that a finite T has an EPP feature which triggers movement of the closest active matching goal to spec-T, in conformity with the Attract Closest Principle. In §7.8, we suggested that control to likewise carries an EPP feature triggering movement of the closest active goal to spec-T. If (as we did in the previous chapter) we make the unitary assumption that all T-constituents in English have an EPP feature, it follows that raising to will likewise carry an EPP feature. Chomsky (2001, fn.56) argues that (somewhat contrived) sentences like (51) below provide empirical evidence that this is so:

(51) John seems to Fred [to appear to himself [to like Mary]]

Here, himself refers to John, not to Fred. This is puzzling if we assume that the antecedent of a reflexive must be an argument locally c-commanding the reflexive (and hence contained within the same TP as the reflexive), since if raising to has no EPP feature and John moves directly from being the subject of the like clause to becoming the subject of the seem clause, the lefthand bracketed TP containing the reflexive will contain no antecedent for himself, and hence we will wrongly predict that sentences like (47) are ill-formed. By contrast, argues Chomsky, if we posit that raising to does indeed have an EPP feature, John will move from being subject of like Mary to becoming subject of to like Mary, then later becoming subject of to appear to himself to like Mary, before finally moving to become the subject of the null T constituent in the seem clause. This will mean that a null trace copy of John is left behind as the subject of each of the two infinitive clauses, as shown in skeletal form in (52) below:

(52) John seems to Fred [John to appear to himself [John to like Mary]]

Since the reflexive himself is locally c-commanded by the bold-printed trace John in (52) within the lefthand bracketed TP containing the reflexive, (52) correctly predicts that himself will be interpreted as referring to John. (Recall that Chomsky posits that trace copies are deleted in the phonological component but remain visible in the syntactic and semantic components. Further evidence that A-movement in raising structures is successive-cyclic is presented in Bošković 2002b.)

Sentences like (51) suggest that raising to must have an EPP feature triggering movement of an argument to spec-T. But it’s important to bear in mind that the EPP feature on T works in conjunction with the person/number φ-features of T: more specifically, the EPP feature on T triggers movement to spec-T of an active goal which T agrees with in respect of one or more φ-features (i.e. in person or number or both). It therefore follows that T in raising clauses must carry one or more φ-features if it is to trigger movement of a nominal carrying φ-features of its own. Now it clearly cannot be the case that raising to carries both person and number, since if it did we would wrongly predict that raising clauses require a null PRO subject (given that infinitival to assigns null case to its subject by (47) when carrying both person and number). The conclusion we reach, therefore, is that raising to must carry only one φ-feature. But which φ-feature – person or number?

The answer is provided by raising sentences such as the following:

(53) There do seem to remain several problems
On the assumption that raising to carries an EPP feature requiring it to attract a subject, the expletive pronoun there will raise (in successive cyclic fashion) from its original position as the specifier of the unaccusative verb remain to become the specifier of infinitival to, and thereafter raise still further to become the specifier of the present-tense T-auxiliary do, in the manner shown by the arrows in the skeletal structure in (54) below:

(54) \[
\begin{array}{l}
\text{[CP} [\text{C} \emptyset] [\text{TP} \text{There} [\text{T} \text{do}] [\text{VP} \text{[v seem] [TP there [T to] [VP there [V remain] several problems]]}]])
\end{array}
\]

If the EPP feature on a T-constituent attracts a goal which the probe agrees with in respect of one or more φ-features, movement of there to become the specifier of raising to on the subordinate clause T-cycle means that the φ-feature carried by to in (54) must match that carried by expletive there. Since we argued in §7.6 that expletive there carries person (but not number), it also follows that to in (54) must carry a person feature. This being so, the EPP feature of raising to will require it to project a specifier carrying a person feature, and expletive there clearly satisfies this requirement.

Our conclusion can be generalised from raising sentences like (53) to long-distance expletive passives like (55a) below, involving the movement operation arrowed in (55b):

(55)(a) There are thought to remain several problems
(b) \[
\begin{array}{l}
\text{[CP} [\text{C} \emptyset] [\text{TP} \text{There} [\text{T} \text{are}] [\text{VP} \text{[v thought] [TP there [T to] [VP there [V remain] several problems]]}]])
\end{array}
\]

Passive to (i.e. the kind of to found in long-distance passives) cannot carry both person and number features, since otherwise it would wrongly be predicted to require a subject with null case. Since there is attracted to become the specifier of to in (55b) and there has a person feature, it seems reasonable to conclude that passive to (like raising to) carries person but not number.

We can generalise our finding still further to infinitival TPs like those bracketed in (56, 57) below:

(56)(a) They were expecting [TP the visitors to be met at the airport]
(b) They were expecting [TP there to be someone to meet the visitors at the airport]
(57)(a) I will arrange [CP for [TP the visitors to be met at the airport]]
(b) I will arrange [CP for [TP there to be someone to meet the visitors at the airport]]

The bracketed TPs in (56) are ECM clauses (with the properties noted in §3.8). Since the visitors originates as the thematic complement of the passive verb met in (56a) but ends up as the subject of [T to], it is clear that the head T of the bracketed complement-clause TP must contain an EPP feature and at least one φ-feature. Since the infinitive subject can be expletive there in (56b), and since there carries only person, it follows that the head T of an ECM clause must carry a person feature as well as an EPP feature. But if we suppose that a non-finite T which carries a full set of person and number features (like the head T of a control clause) assigns null case to its subject, then it is apparent from the fact that the subject of an ECM clause is an overt constituent and hence does not have null case that the head T of an ECM clause must also be defective, and so carry an EPP feature and a person feature, but no number feature. Our conclusion can be generalised in a straightforward fashion to for-infinitive structures like those bracketed in (57): if we define ECM structures as structures in which a constituent within TP is assigned case by an external head lying outside the relevant TP, it follows that for-infinitives are also ECM structures.

Our argumentation here leads us to the following more general conclusions about the feature composition of T in English:

(58) \textbf{Feature Composition of T in English}

(i) T always carries an EPP feature and a person feature in all types of (finite and non-finite, main and complement) clauses
(ii) T also carries a number feature in complete clauses which are CPs (i.e. in finite clauses and control clauses), though not in defective clauses which are only TPs (hence not in raising clauses, or long-distance passives, or ECM clauses)

And these are essentially the assumptions made in Chomsky (2001).
In the light of the assumptions in (58), consider the derivation of the following sentence:

(59) Several prizes are thought likely [to be awarded]

Since the bracketed infinitive complement in (59) is the TP complement of the raising adjective likely, it is a defective clause and so $[T \text{to}]$ will carry uninterpretable EPP and person features (but no number feature) in accordance with (58i/ii). This means that at the point where $to$ is merged with its complement we have the structure shown in skeletal form below:

(60) $[T \text{to}]$ be awarded $[\text{several prizes}]

\begin{align*}
[u-Pers] & \quad [3-Pers] \\
[EPP] & \quad [Pl-Num] \\
[u-Case] &
\end{align*}

Since $[T \text{to}]$ is the highest head in the structure at this point and is active by virtue of its uninterpretable person feature, $[T \text{to}]$ serves as a probe which searches for an active goal and locates several prizes, which is active by virtue of its unvalued case feature. The unvalued person feature on the probe $to$ is valued as third person (and deleted) via agreement in person with the goal several prizes. But what of the unvalued case feature on the goal several prizes? This cannot be valued by infinitival $to$ in (60) because $to$ is not a case assigner (and, more generally, it would seem that only non-defective probes can be structural case assigners); consequently, the case feature of several prizes cannot be deleted either, on the assumption that an unvalued feature can only be deleted as part of an operation which values it. The EPP feature of $to$ is deleted by movement of several prizes to spec-T, thereby deriving the structure (61) below (simplified in various ways, including by showing the deleted trace of several prizes without its features):

(61) several prizes $[T \text{to}]$ be awarded several prizes

\begin{align*}
[3-Pers] & \quad [3-Pers] \\
[Pl-Num] & \quad [EPP] \\
[u-Case] &
\end{align*}

Note that several prizes remains active at this point, because its uninterpretable case feature has not yet been valued or deleted. Merging the structure (61) with the raising adjective likely, merging the resulting AP with the passive verb thought and then merging the resulting VP with a finite present-tense T constituent containing BE will derive:

(62) $[T \text{BE}]$ thought likely several prizes $[T \text{to}]$ be awarded several prizes

\begin{align*}
[Pres-Tns] & \quad [3-Pers] \\
[u-Pers] & \quad [3-Pers] \\
[Pl-Num] & \quad [EPP] \\
[u-Num] & \quad [u-Case] \\
[EPP] &
\end{align*}

Because it is the head of the overall TP structure and is active by virtue of its uninterpretable φ-features, BE serves as a probe which searches for an active goal and locates several prizes (which is active by virtue of the fact that its uninterpretable case feature has not been valued or deleted at this point); consequently, the goal several prizes values and deletes the uninterpretable person/number features of the probe BE. By virtue of being finite and non-defective, BE values the unvalued case-feature of the agreeing nominal several prizes as nominative, and deletes it. The EPP feature of BE is deleted by moving several prizes to spec-T, so deriving:

(63) several prizes $[T \text{BE}]$ thought likely several prizes $[T \text{to}]$ be awarded several prizes

\begin{align*}
[3-Pers] & \quad [Pres-Tns] \\
[Pl-Num] & \quad [3-Pers] \\
[Nom-Case] & \quad [3-Pers] \\
[Pl-Num] & \quad [EPP] \\
[EPP] &
\end{align*}

The resulting TP is subsequently merged with a null declarative complementiser, and BE is ultimately spelled out as are. Since all unvalued features have been valued and all uninterpretable features have been deleted, the derivation converges (i.e. results in a well-formed structure which can be assigned an appropriate phonetic representation and an appropriate semantic representation).
7.10 Defective clauses with expletive subjects

In the previous section, we looked at the syntax of defective clauses which have thematic subjects; in this section, we turn to look at defective clauses with expletive subjects. Let’s begin by comparing the derivation of (59) above with the derivation of the corresponding expletive sentence:

(64) There are thought likely to be awarded several prizes

The derivation of (64) proceeds as follows. The passive verb awarded merges with its complement several prizes to form the V-bar awarded several prizes. Since the internal argument several prizes is indefinite, the resulting V-bar can be merged with the expletive pronoun there (in accordance with the Indefiniteness Condition (33ii) above) to form the VP there awarded several prizes. This VP is then merged with the passive auxiliary be to form the AUXP be there awarded several prizes. The resulting AUXP is subsequently merged with infinitival to (which – by virtue of heading the complement of the raising adjective likely – is a defective T constituent carrying person and EPP features only) to form the structure shown in skeletal form below:

(65) [T to] be there awarded [several prizes]
    [u-Pers] [3-Pers] [3-Pers]
    [EPP] [Pl-Num] [u-Case]

Infinitival to (by virtue of being the head of the overall structure and being active) serves as a probe and identifies both there and several prizes as active goals (there being active by virtue of its uninterpretable person feature, and several prizes by virtue of its uninterpretable case feature). Person agreement between the probe to and its two third-person goals (there and several prizes) results in the unvalued person feature on to being valued as third-person via (7) and deleted via (13). The unvalued case-feature on the goal several prizes cannot be valued or deleted by infinitival to, given our earlier assumption that to is a defective probe which cannot value or delete an unvalued case feature on a goal. But what about the uninterpretable person feature on expletive there? If this gets deleted at this point, there will be inactivated at the end of the T-cycle, once it has moved to become the specifier of infinitival to: and this will wrongly predict that sentences such as the following should be grammatical:

(66) *It is thought likely there to be awarded several prizes

However, the fact that this sentence is ungrammatical (while that in (64) above is grammatical) suggests that there does not have its person feature deleted or inactivated at this point. Why should this be? Chomsky (1999) suggests a condition on deletion of case/agreement features which we can outline informally in the following terms (where α is a probe and β a goal, or conversely β is a probe and α a goal):

(67) Completeness Condition

An uninterpretable case/agreement feature on a constituent α is deleted when α agrees (in respect of one or more φ-features) with a φ-complete constituent β (i.e. with a non-defective β which carries a complete set of φ-features – both person and number)

In consequence of the Completeness Condition (67), the uninterpretable person feature on the expletive goal there cannot be deleted by the T-probe to in (65) because to is a defective probe (by virtue of carrying person but not number), and only agreement with a φ-complete probe (i.e. one with both person and number) can delete case/agreement features on a goal. The EPP feature on to triggers movement of the closest active goal (= there) to spec-T and (if we continue to assume that movement of any goal – whether φ-complete or not – to spec-T deletes the EPP feature on T) is thereby deleted, deriving:

(68) there [T to] be there awarded [several prizes]
    [3-Pers] [u-Pers] [3-Pers]
    [EPP] [Pl-Num] [u-Case]

Merging the TP in (68) with the raising adjective likely, merging the resulting AP with the passive verb thought and merging the resulting VP with a present tense T containing BE will derive:
At this point, \([T \ BE]\) is the highest head in the overall structure and so serves as a probe. Its uninterpretable person and number features make it active, and mean that \([T \ BE]\) looks for one or more active goals which can value its person/number features. There are two such active nominal goals in (69) – namely the expletive pronoun \(there\) (active by virtue of its undeleted uninterpretable third person feature) and the quantifier phrase \(several\ \ prizes\) (active by virtue of its undeleted uninterpretable case feature, and carrying both person and number features): accordingly, the probe \(BE\) simultaneously agrees with both \(there\) and \(several\ \ prizes\). The unvalued person feature of \(BE\) will be valued as third-person via agreement with the third-person goals \(there\) and \(several\ \ prizes\), and the unvalued number feature of \(BE\) will be valued as plural via agreement with the plural goal \(several\ \ prizes\). The uninterpretable person/number features on the probe \(BE\) are deleted in accordance with the Completeness Condition (67) because \(BE\) agrees with the \(\phi\)-complete goal \(several\ \ prizes\). The unvalued case feature on the goal \(several\ \ prizes\) will be valued as nominative via (7ii) and deleted via agreement with the \(\phi\)-complete probe \(BE\) in conformity with the Completeness Condition (67). The EPP feature of \(BE\) attracts the closest active goal (namely \(there\)) to move to become the specifier of \(BE\) (movement resulting in deletion of the EPP feature on \(BE\)), so deriving:

\[
\text{(70) } \begin{array}{ccc}
&T \ BE& \text{ thought likely } \begin{array}{c} \text{there} \\
& \text{to} \\
& \text{awarded} \\
& \text{several prizes} \\
\end{array}
\end{array}
\]

The resulting structure will then be merged with a null declarative complementiser, and \(BE\) will ultimately be spelled out as the third-person-plural present-tense form \(are\). As required, all uninterpretable features have been deleted from (70), so only the bold interpretable features are seen by the semantic component.

Note that an important assumption which is incorporated into the analysis presented here is that all the agreement, case assignment, movement and deletion operations which apply on the T-cycle apply simultaneously, in conformity with the Simultaneity Condition (17). A further key assumption we have made is that \(T\) can agree with multiple goals, so that (e.g.) \([T \ BE]\) agrees with both \(there\) and \(several\ \ prizes\) in (69). At first sight, it might seem that allowing a probe to agree with multiple goals creates unwelcome asymmetries between movement and agreement. This is because (in consequence of the Attract Closest Principle) the EPP feature of \(T\) only triggers movement of a single goal (viz. the closest one) to spec-\(T\), whereas agreement can target more than one goal. However, this potential difference between movement and agreement can be reconciled if we suppose that an agreeing head probes only as far as the closest \((\phi\)-complete) goal which can value all its agreement features – so allowing \(BE\) to probe as far as \(several\ \ prizes\) in (69). It would then follow that agreement and EPP features alike can only probe as far as the closest constituent which will satisfy all their requirements – and this condition in turn is arguably reducible to the Economy Condition of Chomsky (1989, p.69) requiring that there should be ‘no superfluous steps in derivations’ (so that once a probe has satisfied its requirements, it ceases to probe any further). Since the [EPP] feature on BE in (69) searches for a goal with person, it ceases to probe once it locates the closest person-specified goal, namely \(there\). But since the agreement features on BE require a \(\phi\)-complete goal with both person and number, they probe as far as the QP \(several\ \ prizes\).

Finally, let’s turn to consider the derivation of an ECM structure such as:

\[
\text{(71) } \begin{array}{c}
\text{John is expecting there to be some problems}
\end{array}
\]

This is derived as follows. The verb \(be\) merges with its QP complement \(some\ \ problems\) to form the V-bar \(be\ \ some\ \ problems\). This V-bar is then merged with the expletive pronoun \(there\) to form the VP \(there\ \ be\ \ some\ \ problems\). The resulting VP is in turn merged with infinitival \(to\) (which, being defective in ECM clauses, carries only EPP and person features), so forming the structure shown in simplified form below:
Accordingly, the (abstract) person and number features on the verb continue to probe until it locates a goal like the QP agreement with the unvalued and uninterpretable case feature) and which carries both person features have been valued. It locates expletive goal which is active (by virtue of its uninterpretable person feature on the expletive goal there cannot be deleted by the probe to), because to is a defective probe which does not have a complete set of phi-features (in that to has person but not number). The EPP feature on to triggers raising of the closest person-specified goal (= there) to spec-T and is thereafter deleted, so deriving the structure shown below:

\[
\begin{array}{c}
\text{there} & [\text{T to}] & \text{there} & \text{be} & \text{[several problems]} \\
[\text{u-Pers}] & [\text{3-Pers}] & [\text{3-Pers}] & [\text{3-Pers}] & [\text{Pl-Num}] & [\text{u-Case}]
\end{array}
\]

The ECM verb expecting then merges with the TP in (73) (and with its subject John) to form the VP shown in (74) below:

\[
\begin{array}{c}
\text{John} & \text{expecting} & \text{there} & [\text{T to}] & \text{there} & \text{be} & \text{[several problems]} \\
[\text{u-Pers}] & [\text{3-Pers}] & [\text{3-Pers}] & [\text{3-Pers}] & [\text{Pl-Num}] & [\text{u-Case}]
\end{array}
\]

If (as Chomsky posits), structural case-marking involves agreement between probe and goal, it follows that the transitive verb expecting in (74) will enter the derivation with unvalued, uninterpretable person and number features which make it an active probe. The verb expecting thus probes until all its agreement features have been valued. It locates expletive there as a goal (active by virtue of its uninterpretable person feature), but since there can only value the person (and not the number) feature on the verb expecting, it continues to probe until it locates a goal like the QP several goals which is active (by virtue of its unvalued and uninterpretable case feature) and which carries both person and number features.

Accordingly, the (abstract) person and number features on the verb expecting are valued as third-person via agreement with both there and several problems, and as plural via agreement with several problems: the person and number features on the probe expecting are also deleted via agreement with the \( \varphi \)-complete goal several problems. The case feature on the goal several problems is valued as accusative in accordance with (45) above (and concomitantly deleted) via agreement with the \( \varphi \)-complete probe expecting (the transitivity of the verb expecting being reflected in the fact that it has an external argument – namely John). The uninterpretable third-person feature on the expletive goal there is deleted via person agreement with the \( \varphi \)-complete probe expecting. After all these various operations have taken place simultaneously, we derive the structure in (75) below at the end of the V-cycle:

\[
\begin{array}{c}
\text{John} & \text{expecting} & \text{there} & [\text{T to}] & \text{there} & \text{be} & \text{[several problems]} \\
[\text{Pl-Num}] & [\text{3-Pers}] & [\text{3-Pers}] & [\text{3-Pers}] & [\text{Pl-Num}] & [\text{Acc-Case}]
\end{array}
\]

Merging the resulting VP with a T constituent containing the progressive auxiliary BE, and then merging the resulting TP with a null declarative complementiser ultimately derives the structure associated with (71) John is expecting there to be several problems.

An interesting descriptive observation which we note in passing is that although we implicitly treated the verb BE as an unaccusative predicate in structures like (69) above, it nonetheless differs from other unaccusative predicates (e.g. remain) in seemingly requiring the use of expletive there with an indefinite associate – as we see from contrasts such as:
(76)(a) **There** has remained/been *some dissatisfaction*
(b) *Some dissatisfaction* has remained/*been*

This might perhaps suggest that (when used as an existential predicate – i.e. a predicate describing the existence of some entity) **BE** is listed in the lexicon as obligatorily requiring expletive **there** as its specifier, (with **there** perhaps having some kind of locative function, as suggested by Moro 1997). However, we set this (and other descriptive details) aside here.

A conclusion which comes out of the assumption that T always has an **EPP** feature and a person feature is that A-movement will always be a **local** operation which (in complex structures where a noun or pronoun expression moves out of one or more lower TP constituents to become the subject of a higher TP) applies in a **successive-cyclic** fashion, with the relevant expression moving to become the subject of a lower TP before going on to become the subject of a higher TP. Since we saw in §4.5 that head movement is also successive-cyclic (in that a moved head moves into the next highest head position within the structure immediately containing it), and since we saw in §5.6 that wh-movement is also successive cyclic (in that an expression which undergoes wh-movement moves one clause at a time), the greater generalisation would appear to be that all movement is local (and hence successive cyclic in complex structures), so that any moved constituent moves into the closest appropriate landing site above it (in conformity with locality principles such as Chomsky’s 1973 Subjacency Condition or the Relativised Minimality Condition of Rizzi 1990, 2001a).

A final comment to make before closing this chapter is that although T in defective clauses in English seems to carry an incomplete set of agreement features, there is evidence that in languages which use subjunctive clauses in contexts where English uses infinitives (e.g. in **seem**-type raising structures), T in defective clauses carries a complete set of (person/number) agreement features, but is defective in respect of its tense properties (in being untensed, and hence showing no tense contrasts): see Uchibori (2000), Landau (2006), and Polinsky and Potsdam (2006). This suggests that a broader cross-linguistic characterisation of the notion of **defective clause** is required.

### 7.11 Summary

In this chapter, we have taken a look at Chomsky’s recent work on case, agreement and movement. In §7.2 we saw that agreement plays an integral role in nominative case assignment, in that nominative case is assigned to a nominal (i.e. noun or pronoun expression) which agrees in person and number with a finite T. In §7.3 we argued that some features enter the derivation already valued (e.g. the tense feature of T and the person/number **φ**-features of nominals), whereas others (e.g. the **φ**-features of T and the case feature of nominals) are initially unvalued and are assigned values in the course of the derivation via a case/agreement feature-valuation operation. In §7.4, we argued that agreement and case-marking involve a relation between an active probe and an active goal, and that probe and goal are only active if they carry one or more uninterpretable features (e.g. uninterpretable **φ**-features or case features).

We also saw that uninterpretable features have to be deleted in the course of the derivation by a Feature Deletion operation, in order to ensure that they do not feed into the semantic component and thereby cause the derivation to crash (because they are **illegal** in the semantic component), and we posited that a feature becomes inactive in the syntax and invisible to the semantic component once deleted (while remaining visible to the PF component). In §7.5, we suggested that expletive **it** enters the derivation with uninterpretable third-person and singular-number features, and that these value, delete and in turn are deleted by those of the auxiliary **is** in sentences such as *It is said that he has taken bribes*; we argued that an expletive originates as the specifier of an intransitive VP which has no external argument. In §7.6, we argued that expletive **there** carries only an uninterpretable third person feature. We looked at the distribution of expletive pronouns and concluded that expletive **there** is used in structures where a verb has an indefinite (pro)nominal internal argument, and expletive **it** in structures where there is no other active agreeing (pro)nominal goal. In §7.7 we outlined Chomsky’s agreement-based theory of A-movement under which A-movement involves an agreement relation between an active probe with an **EPP** feature and an active goal, and we noted that the **EPP** feature of T is satisfied (and deleted) by movement of the closest active goal to spec-T. In §7.8 we looked at the syntax of infinitive clauses. We saw that the **PRO** subject of a control infinitive originates within VP and that it is attracted to move to spec-T by an infinitival **to** which carries non-finite tense and an **EPP** feature, and which agrees in person and number with and assigns null case to **PRO**. In §7.9 we went on to argue that T in other types of infinitive clause (e.g. the infinitival
complements of raising, passive and ECM predicates) is defective in that although it carries uninterpretable EPP and person features (the latter serving to make T active), it lacks the number feature carried by T in finite/control clauses. And in §7.10, we extended this analysis to defective clauses with expletive subjects. We saw that the assumption that T always has EPP and person features means that A-movement takes place in a successive-cyclic fashion, with the moved expression being raised to become the subject of a lower TP before raising to become the subject of a higher TP. We went on to conclude that all movement operations are local (and hence apply in a successive-cyclic fashion in complex structures).

The key assumptions which we have made in this chapter are summarised below (slightly modified from earlier formulations in the light of assumptions made in later sections of the text):

(77) **Feature Composition of T in English**
(i) T always carries an EPP feature and a person feature in all types of (finite and non-finite, main and complement) clauses
(ii) T also carries a number feature in complete clauses which are CPs (i.e. in finite clauses and control clauses), though not in defective clauses which are only TPs (hence not in raising clauses, or long-distance passives, or ECM clauses)

(78) **Activity Condition**
A constituent is only active (for agreement, case-marking or A-movement) if it contains an undeleted uninterpretable feature

(79) **Feature Valuation (Agreement and Case Assignment)**
When an active probe (like T) agrees with one or more active goals in its local domain
(i) the unvalued (person/number) φ-features on the probe will be valued (i.e. assigned a value which is a copy of that on the goal/s)
(ii) the unvalued case feature/s on the goal/s will be valued (i.e. assigned a value dependent on the nature of the probe – e.g. nominative if the probe is a finite T)

(80) **Feature Deletion**
(i) An uninterpretable case/agreement feature on a constituent α is deleted when α agrees (in respect of one or more φ-features) with a φ-complete constituent β which carries a complete set of person and number φ-features (= Completeness Condition)
(ii) An uninterpretable EPP feature on a probe P is deleted by movement of the closest active goal to spec-P (= EPP Condition)
(iii) Once deleted, a feature becomes invisible in the syntactic and semantic components, while remaining visible in the PF component (Invisibility Condition)

(81) **Simultaneity Condition**
All syntactic operations which apply on a given cycle apply simultaneously

(82) **Expletive Conditions**
(i) **External Argument Condition:**
An expletive can only be merged as the highest argument of a verb with no external argument
(ii) **Indefiniteness Condition:**
Expletive there can only be merged with a verb which has an indefinite nominal or pronominal internal argument
(iii) **Inactivity Condition**
Expletive it can only be merged with a constituent which does not contain a nominal or pronominal expression with active case- or φ-features

Recall that in our discussion in the main text we also posited that:

(83) In consequence of the **Economy Condition**, an active head probes only as far as the closest goal which can satisfy the requirements of all relevant (e.g. EPP or agreement) features on the head.
WORKBOOK SECTION

Exercise 7.1
Discuss the derivation of the following sentences, paying particular attention to the syntax of case, agreement and EPP features:
1   Many miners may die
2   Many miners are thought to have died
3   No prize was awarded
4   No prize is likely to be awarded
5   They are hoping to be promoted
6   They appear to be hoping to be promoted
7   She is expecting him to be promoted
8   She seems to be expecting him to be promoted
9   He is believed to want to be promoted
10  He appears to be believed to want to be promoted

Helpful hints
When have or be occurs immediately after infinitival to, take it to be the head AUX constituent of an AUXP projection; and in 7, assume that is functions as a copula and raises from V to T in the manner described in §4.6. Bear in mind the key assumptions summarised in (77-82) in the main text.

Model answer for 1
The verb die is an unaccusative predicate – as we see from the postverbal position of the italicised subject in a (somewhat contrived) expletive sentence like
(i)   Never before had there died so many miners in a single accident
and from the fact its Italian counterpart morire is used in conjunction with the perfect auxiliary essere ‘be’, as we see in:
(ii)  Sono morti parecchi minatori

Are died several miners (‘Several miners have died’)

Accordingly, sentence 1 is derived as follows. The unaccusative verb die is merged with the QP many miners to form the VP die many miners. This is then merged with a present-tense T constituent containing the modal auxiliary may to form the structure shown below:

(iii)

\[
\begin{array}{c}
\text{T} \\
\text{may} \\
[\text{Pres-Tns}] \\
[u-Pers] \\
[u-Num] \\
[EPP] \\
\text{V} \\
\text{die} \\
\text{QP} \\
[3-Pers] \\
[\text{Pl-Num}] \\
[u-Case] \\
\text{VP} \\
\end{array}
\]

The T-auxiliary may is a probe by virtue of being the head of the overall structure and is active by virtue of its (abstract) uninterpretable person and number features, in accordance with (78). It searches for an active goal and locates the QP several miners (which is active by virtue of its uninterpretable case feature). Via agreement with the φ-complete goal several miners, the φ-features on the probe may are valued as third person plural in accordance with (79i), and deleted in accordance with (80i). Via agreement with the finite φ-complete probe may, the case feature on the goal several miners is valued as nominative in accordance with (79ii), and deleted in accordance with (80i). The EPP feature on T is deleted by movement of the closest goal several miners to spec-T, in conformity with (80ii). These various (agreement, case-marking, movement and deletion) operations apply simultaneously on the T-cycle in accordance with (81), so deriving the TP shown in (iv) below:
The resulting TP is then merged with a null complementiser containing an interpretable declarative force feature. In accordance with (80iii), deleted features are invisible in the semantic component, but visible in the PF component (though there is no overt spellout of the abstract person/number agreement features on the modal auxiliary *may*). Since all unvalued features have been valued (and all uninterpretable features deleted), the derivation converges both at the interface with the PF component and at the interface with the semantic component.

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**Exercise 7.2**

Discuss the syntax of the following expletive sentences, paying particular attention to case-marking and agreement, and to the choice of expletive pronoun:

1. There/*It remains every hope of finding survivors
2. There/*It does appear to remain some discontent
3. *There/*It does appear some discontent to remain
4. It/*There is said that there/*it have been some demonstrations
5. *It is said there to have been some demonstrations
6. There/*It are said to have been some demonstrations
7. It/*There does seem to be expected that there/*it will be some strikes
8. I believe it/*there to be essential for there/*it to be some safeguards
9. It/*There does seem that it/*there is snowing
10. The jury found there to be no evidence of corruption

**Helpful hints**

Take non-finite forms of **BE/HAVE** to be an AUX (heading an AUXP) in *to have...* in 5 and 6 and in *be expected...* in 7. Take non-finite forms of BE to be a copular V heading a VP when followed by a QP (like *some demonstrations* in 4, 5 and 6, *a strike* in 7, *some safeguards* in 8, or *no evidence of corruption* in 10. In 9, assume that *snow* is an unaccusative verb, and that its subject originates in the same position as other unaccusative subjects. Bear in mind the key assumptions summarised in (77-82) in the main text. Assume the complementiser *for* in example 8 has the same case/agreement properties as a transitive ECM verb.

**Model answer for 1**

Given the assumptions made in the text, sentence 1 will be derived as follows. The noun *hope* is merged with its PP complement of *finding survivors* (whose structure need not concern us here) to form the NP *hope of finding survivors*. This NP is merged with the quantifier *every* to form the QP *every hope of finding survivors*. The resulting QP is merged as the complement of the unaccusative verb *remain* to form the V-bar *remain every hope of finding survivors*. This V-bar is then merged with expletive *there* to form the VP *there remain every hope of finding survivors*, with *there* being merged as the highest argument of a verb (*remain*) which has an indefinite internal argument *every hope of finding survivors* but no external argument, so that Expletive Conditions (81)(i) and (ii) are satisfied. The resulting VP in turn is merged with an affixal finite T constituent (denoted as *Af*) to form the structure shown in simplified form in (i) below:
(Note that expletive it could not be used in place of there here, because the Inactivity Condition would prevent it from being merged with a V-bar like that in (i) which contains a constituent with an active case feature, such as the QP every hope of finding survivors.) The affixal T constituent serves as a probe because it is the highest head in the structure, and because its uninterpretable person/number features make it active in conformity with (78). Consequently, T searches for active goals, locating the expletive pronoun there, which is active by virtue of its uninterpretable person feature. However, since there carries no number feature and so cannot value the number feature on T, the T head probes further until it located the (person-and-number-specified) QP every hope of finding survivors (active by virtue of having an uninterpretable case feature). The person/number features on T are valued as third person singular (in accordance with (79i) in the main text) via multiple agreement with there and every hope of finding survivors, and deleted (in accordance with (80i)) via agreement with the φ-complete goal every hope of finding survivors. The uninterpretable person feature on expletive there is deleted via agreement with the φ-complete (affixal) T-probe, in accordance with (80i). Via agreement with the φ-complete affix in T, the unvalued case feature on every hope of finding survivors is valued as nominative in conformity with (79ii) and deleted in accordance with (80i). In accordance with the Economy Condition, the uninterpretable EPP feature on the T-probe (which requires T to have a specifier with person) is deleted by movement of the closest person-specified goal (= there) to spec-T, in conformity with (80ii). These various agreement, case assignment, movement and deletion operations take place simultaneously on the T-cycle, in conformity with (81), so deriving the TP shown below:

The resulting TP is then merged with a null complementiser containing an interpretable declarative force feature. The entire structure in (ii) (including both interpretable and uninterpretable features) is then handed over to the PF component, where the affix in T is lowered onto the verb remain, which is consequently spelled out as the third person singular present tense form remains. The structure in (ii) is simultaneously handed over to the semantic component, where only undeleted features (i.e. the bold-printed interpretable features) are visible in accordance with (80iii). Since all unvalued features have been valued (and all uninterpretable features deleted), the derivation converges both at the interface with the PF component and at the interface with the semantic component.
8.

Split Projections

8.1 Overview

Hitherto, we have assumed a simple model of clause structure in which canonical clauses are CP+TP+VP structures. However, in this chapter, we review work suggesting that CP, TP and VP should be split into more than one type of projection – hence the title of this chapter. We begin by looking at arguments that the CP layer of clause structure should be split into a number of separate (Force Phrase, Topic Phrase, Focus Phrase and Finiteness Phrase) projections. We then go on to explore the possibility of splitting TP into separate Tense Phrase and Mood Phrase projections. In the remainder of the chapter, we look at evidence that verb phrases should be split into two separate projections – one headed by a lexical verb and the other by an abstract light verb.

8.2 Split CP: Force, Topic and Focus projections

Our discussion of wh-movement in chapter 5 was concerned with movement of (interrogative, exclamative, and relative) wh-expressions to the periphery of clauses (i.e. to a position above TP). However, as examples like (1) below illustrate, it is not simply wh-constituents which undergo movement to the clause periphery:

(1) No other colleague would he turn to

In (1), no other colleague (which is the complement of the preposition to) has been focused/focalised – i.e. moved to the front of the sentence in order to focus it (and thereby give it special emphasis). At first sight, it would appear that the focused negative expression moves into spec-C and that the pre-subject auxiliary would moves from T to C in the manner shown in (2) below (simplified inter alia by not showing he originating in spec-V):

(2) \[ CP \text{No other colleague [C would [T he [T would] [VP [V turn] [PP [P to] no other colleague][])]]] \]

However, one problem posed by the CP analysis of focusing/focalisation sketched in (2) is that a structure containing a preposed focused constituent can occur after a complementiser like that, as in (3) below:

(3) I am absolutely convinced [that no other colleague would he turn to]

This suggests that there must be more than one type of CP projection ‘above’ TP in clauses: more specifically, there must be one type of projection which hosts preposed focused constituents, and another type of projection which hosts complementisers. Reasoning along these lines, Luigi Rizzi (1997, 2001b, 2004) suggests that CP should be split into a number of different projections – an analysis widely referred to as the split CP hypothesis. More specifically, he suggests that complementisers (by virtue of their role in specifying whether a given clause is declarative, interrogative, imperative, or exclamative in force) should be analysed as Force markers heading a ForceP (= Force Phrase) projection, and that focused constituents should be analysed as contained within a separate FocP (= Focus Phrase) headed by a Foc constituent (= Focus marker). On this view, the bracketed complement clause in (3) would have the structure shown in simplified form below:
The focused QP/quantifier phrase *no other colleague* originates as the complement of the preposition *to* and (by virtue of being focused) moves from complement position within PP into specifier position within FocP. The auxiliary *would* originates in T and from there moves into the head Foc position of FocP. One way of describing the relevant data is to suppose that the head Foc constituent of FocP carries an edge feature [EF] which allows it to attract a negative expression to move into spec-FocP (in which position, the preposed negative expression is interpreted as being focused), and that Foc is a strong (affixal) head carrying a tense feature which attracts the auxiliary *would* to move from T into Foc.

From a discourse perspective, a focused constituent typically represents *new* information (i.e. information not previously mentioned in the discourse and assumed to be unfamiliar to the hearer). In this respect, focused constituents differ from another class of preposed expressions which serve as the *topic* of the clause immediately containing them. Topics typically represent *old* information (i.e. information which has already been mentioned in the discourse and hence is assumed to be known to the hearer). In this connection, consider the sentence produced by speaker B below:

(5) **SPEAKER A**: The demonstrators have been looting shops and setting fire to cars

**SPEAKER B**: That kind of behaviour, we cannot tolerate in a civilised society

Here, the italicised phrase *that kind of behaviour* refers back to the activity of looting shops and setting fire to cars mentioned earlier by speaker A, and so is the *topic* of the discourse. Since the topic *that kind of behaviour* is the complement of the verb *tolerate* it would be expected to occupy the canonical complement position following *tolerate*. Instead, it ends up at the front of the overall sentence, and so would seem to have undergone a movement operation of some kind. Since the relevant movement operation serves to mark the preposed constituent as the topic of the sentence, it is widely known as **topicalisation**. (On differences between focusing and topicalisation, See Rizzi 1997, Cormack and Smith 2000b, Smith and Cormack 2002, Alexopoulou and Kolliakou 2002, and Drubig 2003.) However, since it moves a maximal projection to a specifier position on the periphery of the clause, topicalisation can (like focusing and wh-movement) be regarded a particular instance of the more general **A-bar movement** operation we looked at in chapter 5 whereby a moved constituent is attracted into an A-bar specifier position (i.e. the kind of specifier position which can be occupied by arguments and adjuncts alike).

Rizzi (1997) and Haegeman (2000) argue that just as focused constituents occupy the specifier position within a Focus Phrase, so too topicalised constituents occupy the specifier position within a **Topic Phrase**. This in turn raises the question of where Topic Phrases are positioned relative to other constituents within the clause. In this connection, consider the italicised clause in (6) below:

(6) He had seen something truly evil – prisoners being ritually raped, tortured and mutiliated.

He prayed *that atrocities like those, never again would he witness*

In the italicised clause in (6), *that* marks the declarative force of the clause; *atrocities like those* is the object of the verb *witness* and has been preposed in order to mark it as the topic of the sentence (since it refers back to the acts of rape, torture and mutilation mentioned in the previous sentence); the preposed negative adverbial phrase *never again* is a focused constituent, and hence requires auxiliary inversion. Thus, the italicised *that*-clause in (6) has the simplified structure shown below:
We can assume that the head Top constituent of the Topic Phrase carries an edge feature which allows it to attract a maximal projection to move into the specifier position within the Topic Phrase – in which position, the preposed maximal projection is interpreted as the topic of the relevant sentence. If we further assume that Top is a weak head (and so does not carry a tense feature attracting a tensed auxiliary), we can account for the fact that auxiliary would remains in the strong Foc position and does not raise to the weak Top position.

Rizzi’s split CP analysis raises interesting questions about the syntax of the kind of wh-movement operation which we find (inter alia) in interrogatives, relatives, and exclamatives. Within the unitary (unsplit) CP analysis outlined in chapter 5, it was clear that wh-phrases moved into spec-C; but if CP can be split into a number of distinct projections (including a Force Phrase, a Topic Phrase, and a Focus Phrase), the question arises as to which of these projections serves as the landing-site for wh-movement. Rizzi (1997, p.289) suggests that ‘relative operators occupy the highest specifier position, the spec of Force’. In this connection, consider the syntax of the bracketed relative clauses in (8) below:

(8)(a) A university is the kind of place [in which, that kind of behaviour, we cannot tolerate]
(b) Syntax is the kind of subject [which only very rarely will students enjoy]

In (8a), the preposed wh-expression in which precedes the preposed topic that kind of behaviour; in (8b) the preposed relative pronoun which precedes the preposed focused expression only very rarely. If Rizzi is right in suggesting that preposed relative operator expressions occupy specifier position within the Force Phrase, the bracketed relative clauses in (8a, b) above will have the simplified structures shown below:

(9)(a) [ForceP in which [Force Ø] [Top that kind of behaviour [Top Ø] [TP we cannot tolerate t]]]
(b) [ForceP which [Force Ø] [Foc only very rarely [Foc will] [TP students t enjoy t]]]

(To save space, trace copies of moved constituents are shown as t and printed in the same type-face as their antecedent.)

In much the same way, Rizzi argues that an interrogative wh-expression occupies spec-Force in complement-clause questions. Evidence in support of this claim comes from sentences such as the following (from Culicover 1991):

(10)(a) Lee wonders [whether under no circumstances at all would Robin volunteer]
(b) Lee wonders [why under no circumstances at all would Robin volunteer]

Here, the wh-expressions whether/why occur to the left of the focused negative phrase under no circumstances, suggesting that whether/why do not occupy specifier position within FocP but rather some higher position – and since ForceP is the highest projection within the clause, it is plausible to suppose that whether/why occupy the specifier position within ForceP in structures like (10). Further evidence in support of the same conclusion comes from the contrasts such as the following:

(11)(a) I cannot see [how, this kind of behaviour, we can tolerate in a civilised society]
(b) *I cannot see [this kind of behaviour, how we can tolerate in a civilised society]
The observation that an (italicised) interrogative wh-expression can be followed – but not preceded – by a (bold-printed) topic in complement-clause questions like those bracketed in (11) is consistent with the view that a preposed wh-expression in a complement-clause question occupies spec-ForceP, and hence is positioned above a topic phrase.

A question raised by Rizzi’s analysis of relative and interrogative wh-clauses is where preposed wh-expressions move in exclamative clauses. In this connection, consider (12) below:

(12)(a) How many of their policies only rarely do politicians get around to implementing!
(b) In how many countries, that kind of behaviour, autocratic leaders would simply not tolerate!

In (12a), the italicised exclamative wh-expression how many of their policies precedes the bold-printed focused constituent only rarely, while in (12b) the exclamative wh-phrase in how many countries precedes the underlined topic that kind of behaviour. And in (13) below:

(13) In how many countries of the world, such behaviour, under no circumstances would autocratic leaders tolerate!

an italicised exclamative expression precedes both an underlined topicalised expression and a bold-printed focused expression – though the resulting sentence is clearly highly contrived. All of this suggests that exclamative wh-expressions (like wh-pronouns in relative clauses and interrogative wh-expressions in complement-clause questions) move into the specifier position within ForceP.

From what we have said so far, it might seem plausible to conclude that relative, interrogative and exclamative wh-expressions always move to the specifier position within ForceP. However, Rizzi (1997, p.299) maintains that a preposed interrogative wh-expression ‘ends up in Spec of Foc in main questions’. Furthermore, he maintains (1997, p.295) that ‘There can be … only one structural Focus position per clause’. The twin assumptions that interrogative wh-expressions in main-clause questions move to the specifier position in a Focus Phrase and that no clause may contain more than one Focus Phrase projection together provide a straightforward account of the ungrammaticality of main clause questions such as (14) below:

(14)(a) *What never again will you do? (b) *What will never again you do?

If both what and never again (when preposed) move into the specifier position within FocP, if Foc allows only one focused constituent as its specifier, and if no clause may contain more than one FocP constituent, it follows that (14a) will be ruled out by virtue of Foc having two specifiers (what and never again) and that (14b) will be ruled out by virtue of requiring two Focus Phrase constituents (one hosting what and another hosting never again). Likewise, multiple wh-movement questions (i.e. questions in which more than one wh-expression is preposed) such as (15) below will be ruled out in a similar fashion:

(15)(a) *Who where did he send? (b) *Who did where he send?

Thus, the conclusion which Rizzi’s observation leads us to is that wh-expressions move to the edge of a Focus Phrase projection in main-clause wh-questions, but move to spec-ForceP in other types of clause.

Further evidence in support of the claim that interrogative wh-expressions move to spec-FocP (and not to spec-ForceP) in main-clause questions comes from contrasts such as:

(16)(a) That kind of behaviour, how can we tolerate in a civilised society?
(b) *How can that kind of behaviour we tolerate in a civilised society?

If how were in spec-ForceP, we would be unable to account for the observation that it follows the bold-printed topic phrase in (16a), given Rizzi’s assumption that ForceP is always the highest projection in a split CP. By contrast, if how is in spec-FocP, the order of projections in (16a) is precisely as in (7), with FocP being positioned under TopP, and TopP being positioned under a ForceP projection with a null head. What remains to be accounted for is why the italicised focused wh-word cannot precede the bold-printed topic in (16b). The answer relates to the syntax of the auxiliary can which occupies the head Foc position of FocP in (16b). This originates in the head T position of TP and can thus can get into Foc either by moving directly from T to Foc, or by moving (in successive cyclic fashion) through Top into Foc – these two possibilities being shown by the arrowed movements in the (abbreviated) structure below:
However, direct movement from T to Foc (represented by the dotted arrow) is ruled out because it would violate the Head Movement Constraint (which allows a head to move only into the next highest head position in the structure containing it); and successive-cyclic movement from V through Top into Foc (represented by the two solid arrows) is ruled out because Top is a weak head, and so cannot attract T to move to Top. Consequently, the topic must be positioned above the focused wh-expression in main-clause questions like (16) in English.

A further question raised by Rizzi’s analysis is why interrogative wh-expressions should occupy two different types of position, moving to spec-FocP in a main-clause question structure like (18a) below, but to spec-ForceP in a complement clause question structure like that bracketed in (18b):

(18)(a) \([\text{ForceP} \ [\text{Foc} \phi] \ [\text{FocP} \ \text{what dress} \ [\text{Foc} \ \text{were}] \ [\text{TP} \ \text{you} \ [\text{T} \ \text{were}] \ \text{wearing}]])\]

(b) He asked \([\text{ForceP} \ [\text{FocP} \ \text{what dress} \ [\text{Foc} \ \text{were}] \ [\text{TP} \ \text{you} \ [\text{T} \ \text{were}] \ \text{wearing}]])\]

Part of the answer may lie in the semantic properties of interrogative wh-words, which not only make them suitable candidates for focussing but also mark interrogative force. By virtue of having properties making them suitable to be focussed, they can occupy the specifier position in a Focus Phrase as in (18a); but by virtue of being interrogative in force, they can occupy the specifier position within a Force Phrase as in (18b). More generally, it would appear that constituents which are able to move to the specifier position in FocP share in common the semantic property that they are *operator expressions* (i.e. expressions containing an operator). Negative and interrogative expressions contain an operator which licences (i.e. allows the occurrence of) a subordinate polarity item such as partitive *any*, whereas exclamative and relative wh-expressions do not – as we see from the contrast below:

(19)(a) What sympathy did *any* of the protestors get?

(b) Not a grain of sympathy did *any* of the protestors get

(c) *What a lot of sympathy* any of the protestors got!

(d) *He was surprised at the sympathy which* any of the protestors got

Consequently, operator expressions like the underlined interrogative expression in (19a) and the underlined negative expression in (19b) can move to spec-FocP, but not non-operator expressions like the underlined exclamative expression in (19c) or the underlined relative pronoun in (19d). Instead, exclamative and relative wh-expressions move to the specifier position within a Force Phrase (which might more generally be called a *Type Phrase*, given that a relative pronoun marks a clause as relative in *type* rather than in *force*).

However, all of this still leaves the question of why interrogative expressions move to spec-ForceP (an not to spec-FocP) in embedded questions like (18b). The answer lies in *selection*. In the use illustrated in (18b), the verb like *ask* selects an interrogative complement. If we suppose that a question-asking predicate like *ask* requires a complement with an interrogative edge (i.e. with an interrogative expression on the edge of the relevant projection which serves to mark the relevant clause as interrogative in type), then it follows that movement of an interrogative wh-expression in an interrogative complement clause must be to the specifier position of the highest head in the selected structure – hence to spec-ForceP. By contrast, a main clause is unselected, and so a focused interrogative wh-expression moves only as far as spec-FocP (perhaps for economy reasons, there being no necessity for further movement to spec-ForceP in a main clause: however, we shall offer an alternative answer at the end of §9.4). If Foc is a strong head and Force a weak head, we can account for why auxiliary inversion occurs in main-clause questions like (18a), but not in complement-clause questions like (18b).

On the other hand, because preposed negative expressions are operator expressions but do not mark force (as we see from the fact that there are no predicates which select a negative complement), they move to spec-FocP in both main and complement clauses alike. And because Foc is always a strong head, we can account for why we find auxiliary inversion in complement clauses like that bracketed in (3) above *I am absolutely convinced [that no other colleague would he turn to]*. The bracketed complement clause in (3) would have the structure shown in simplified form in (19) below:
(20) \[
\text{[ForceP [Force \, that \, [FocP \, no \, other \, colleague \, [Foc \, would] \, [TP \, he \, [\_ \, would] \, turn \, to \, no \, other \, colleague]]]}
\]

Its main-clause counterpart \textit{No other colleague would he turn to} would have an analogous structure, save for the head Force constituent of ForceP being null. (For alternative analyses of preposed negative constituents, see Sobin 2003 and Branigan 2005.)

8.3 Split CP: Finiteness projection

In the previous section, we argued that above TP there may be not just a single CP projection but rather at least three different types of projection – namely a Force Phrase, a Topic Phrase and a Focus Phrase (the latter two being found only in clauses containing focused or topicalised constituents). However, Rizzi argues that below FocP (and above TP) there is a fourth functional projection which he terms \textit{FinP/Finiteness Phrase}, whose head Fin constituent serves the function of marking a clause as finite or nonfinite. He argues that Fin is the position occupied by prepositional particles like \textit{di} ‘of’ which introduce infinitival control clauses in languages like Italian in structures such as that below:

(21) Gianni pensa, il tuo libro, di PRO conoscerci bene

Gianni thinks, the your book, of PRO know.it well

‘Gianni thinks that your book, he knows well’

Rizzi maintains that the italicised clause which is the complement of \textit{pensa} ‘thinks’ in (21) has the simplified structure (22) below:

(22) \[
\text{ForceP}
\]

\[
\text{TopP}
\]

\[
\text{DP}
\]

\[
\text{Top'}
\]

\[
\text{il tuo libro}
\]

\[
\text{your book}
\]

\[
\text{Top}
\]

\[
\text{FinP}
\]

\[
\text{Fin}
\]

\[
\text{Fin}
\]

\[
\text{TP}
\]

\[
\text{TP}
\]

\[
\text{di}
\]

\[
\text{PRO}
\]

\[
\text{conoscerci bene}
\]

\[
\text{of}
\]

\[
\text{PRO}
\]

\[
\text{know.it well}
\]

Under his analysis, \textit{il tuo libro} ‘the your book’ is a topic and \textit{di} ‘of’ is a Fin head which marks its clause as nonfinite (more specifically, as infinitival). Moreover, Rizzi maintains that the Fin head \textit{di} ‘of’ assigns null case to the PRO subject of its clause (an account of null case assignment in keeping with our account in §3.9, but not with the Chomskyan account given in §7.8 unless we assume that Fin can ‘hand over’ its null-case-assignment property to T – a possibility discussed in the next chapter).

While present-day English has no overt counterpart of infinitival particles like Italian \textit{di} in control clauses, it would seem that infinitival \textit{for} served essentially the same function in Middle English control infinitives such as those bracketed below:

(23)(a) Al were it good \textit{[no womman for to touche]} (Chaucer, \textit{Wife of Bath’s Tale}, line 85)

Although it would be good to touch \textit{no woman}

(b) I wol renne out, \textit{[my borel for to shewe]} (Chaucer, \textit{Wife of Bath’s Tale}, line 356)

I will run out, in order to show \textit{my clothing}

In (23a/b) the italicised expression is the direct object of the verb at the end of the line, but has been focalised/topicalised and thereby ends up positioned in front of \textit{for}. This is consistent with the possibility that \textit{for} occupies the same \textit{Fin} position in Middle English as \textit{di} in Modern Italian, and that the italicised complements in (23a/b) move into specifier position within a higher Focus Phrase/Topic Phrase projection. Since the \textit{for} infinitive complement in (23) has a null subject rather than an overt accusative subject, we can suppose that it is intransitive in the relevant use.

Rizzi (1997) argues that \textit{for} in overt-subject infinitives in present-day English also functions as a nonfinite Fin head (albeit an obligatorily transitive one). He notes that evidence in support of the assumption that the finite complementiser \textit{that} occupies the head Force position of ForceP whereas infinitival \textit{for} occupies the head Fin position of FinP comes from contrasts such as the following (adapted
(24)(a) He is anxious [that John should leave tomorrow]
(b) He is anxious [that, tomorrow, John should leave]
(c) He is anxious [for John to leave tomorrow]
(d) *He is anxious [for, tomorrow, John to leave]

The relevant sentences show that a topicalised (italicised) adverbial like tomorrow can be positioned between that and its TP complement, but not between for and its TP complement. Rizzi concludes that this is consistent with the view that the complementiser that is a Force head, for is a Fin head, and topics are positioned between the two.

Additional empirical evidence in support of analysing that as a Force head and for as a Fin head comes from the contrast illustrated by the two different replies given by speaker B in the dialogue below:

(25) SPEAKER A: What was the advice given by the police to the general public?
SPEAKER B: (i) Under no circumstances for anyone to approach the escaped convicts
(ii) That under no circumstances should anyone approach the escaped convicts

Interestingly, the focused prepositional phrase under no circumstances precedes the complementiser for in (25Bi), but follows the complementiser that in (25Bii). This is consistent with Rizzi’s claim that for occupies the head Fin position of FinP, but that occupies the head Force position of ForceP. If inverted auxiliaries move from T through Fin into Foc (as claimed by Rizzi 1997, p.331, fn.22) in order to satisfy the Head movement Constraint (which allows a head to move only into the next highest head position), the two replies given by speaker B in (24) will have the respective structures shown in (26a, b) below:

(26)(a)

(b)
Finiteness Phrase. In a sentence containing a focalised but no topicalised constituent, CP again splits into three projections – namely into a Force Phrase, Focus Phrase and Finiteness Phrase. However, in a structure containing no focalised or topicalised constituents, Rizzi posits that the Finiteness head is syncretised (i.e. conflated) with the Force head immediately above it, so that rather than being realised on two different heads, the relevant force and finiteness features are realised on a single head corresponding to the traditional C constituent (with C in effect being a composite force/finiteness head). In simple terms, what this means is that C only splits into multiple projections in structures containing a topicalised and/or focalised constituent.

We can illustrate the conditions under which CP does (or does not) split in terms of the syntax of the that-clauses in (27) below:

(27)(a) You must know that this kind of behavior we cannot tolerate
(b) You must know that we cannot tolerate this kind of behaviour

In (27a) the object this kind of behaviour has been topicalised, so forcing CP to split into three projections (ForceP, TopP and FinP) as shown in simplified form below:

(28) [ForceP [Force that] [TopP this kind of behaviour] [FinP ø] [TP we [T cannot] tolerate t]]

By contrast, in (27b) there is no topicalised or focalised constituent, hence Fin is syncretised with Force, and CP does not split into multiple projections. Accordingly, only a single syncretised C constituent is projected which carries both finiteness and force features, as in (29) below (where DEC is a declarative force feature and FIN is a finiteness feature):

(29) [CP [C thatDEC, FIN] [TP we [T cannot] tolerate this kind of behaviour]]

Rizzi posits that (in finite clauses) the relevant types of head are spelled out in the manner shown informally in (30) below:

(30) A head in a split CP projection can be spelled out in English as:
(i) that in a complement clause if it carries a declarative force feature (with or without a finiteness feature)
(ii) ø if it carries a finiteness feature (with or without a declarative force feature)

It follows from (30) that the Force head in (28) can be spelled out as that but not as ø, and that Fin can be spelled out as ø but not as that, so accounting for the grammaticality of (27a) and the ungrammaticality of:

(31)(a) *You must know ø this kind of behaviour that we cannot tolerate
(b) *You must know that this kind of behaviour that ø we cannot tolerate
(c) *You must know ø this kind of behaviour ø we cannot tolerate

(Irrelevantly, (31c) is grammatical if written with a colon between know and this kind of behaviour and read as two separate sentences.) It also means that the syncretised (force/finiteness) C constituent in (29) can either be spelled out as that in accordance with (30i), or be given a null spellout in accordance with (30ii) as in (32) below:

(32) You must know [C øDEC, FIN] we cannot tolerate this kind of behaviour

In other words, Rizzi’s analysis provides a principled account of the (overt/null) spellout of finite declarative complementisers in English (though see Sobin 2002 for complications. Note also that complementiser spellout may be different in other languages – see e.g. Alexopoulou and Kolliakou 2002 on Greek.)

Although Rizzi only discusses the possibility of Fin being syncretised with a Force head, there are reasons to suspect that (in English, at least) a null Fin head is always syncretised with the head immediately above it, and that Fin is only projected as a separate head when it is overt (e.g. when it contains infinitival for). One reason for assuming this is that the strength properties of a null Fin are always identical to those of the head immediately above it – as we see from the bracketed clause structures in (33) below:

(33)(a) I must admit [ForceP [Force that] [TopP TV [Top ø] [FinP ø] [TP I [T will] only rarely watch]]]
(b) I must admit [ForceP [Force that] [FocP only rarely [Foc will] [FinP [Fin will] [TP I [T will] watch TV]]]
Thus, because Top is a weak head in (33a), the Fin head below it must also be weak, because if Fin were strong, *will* would raise from T to Fin, so generating the ungrammatical sentence *I must admit that TV will I only rarely watch*. Conversely, because Foc is a strong head in (33b), the Fin head below it must also be strong, because if Fin were weak the auxiliary *will* would be unable to move through Fin into Foc, and the derivation would crash. The fact that a null Fin head always has the same strength as the head above it suggests that the two are syncretised – i.e. that Fin is subsumed within the head above it. This would mean that the bracketed complement clauses in (33) have the syncretised structure shown in (34) below:

(34)(a) I must admit [ForceP [FocP only rarely [FocP I [T will] watch TV]]]
(b) I must admit [ForceP [FocP only rarely [FocP I [T will] watch TV]]]

and hence that FinP only exists as a separate projection in English when it has an overt head (like infinitival *for*). More generally, it may be that Economy principles determine that a head is only projected as an independent head if it has semantic content requiring this, or if it is overt, or if it has a specifier of its own, or if it has an independent strength value – however, it would take us too far astray to pursue these issues here.

Although (in this section and the last) we have outlined Rizzi’s split CP analysis of the left periphery of clauses, it should be noted that (because we have little further to say about topicalisation and focalisation), we shall for the most part revert to using the traditional unsplit CP analysis of the clause periphery in the rest of the book, and thus follow Chomsky (2005b, p.9) in adopting the convention that ‘C is shorthand for the region that Rizzi (1997) calls the left periphery.’

8.4 Split TP: Aspect projection

Parallel to Rizzi’s pioneering work on splitting the peripheral C head into a number of separate types of head (such as Force, Topic, Focus and Finiteness), there have been attempts over the past two decades to split the inflectional head termed INFL in Chomsky (1981) into separate inflectional heads such as Tense, Aspect, Mood and Agreement – most notably by Cinque (1999). However, Chomsky (1995) argued against the postulation of Agreement heads found in much work in the 1990s (See chapter 10 of Radford 1997a or 1997b for discussion of the relevant work), on the grounds that agreement features are uninterpretable, and hence a head which carried only agreement features could not be assigned any interpretation at the semantics interface, and would cause the derivation to crash: accordingly, Chomsky (1995, p.355) proposed ‘eliminating Agr [heads] from UG entirely’ on conceptual grounds. However, since Tense, Aspect and Mood are interpretable features, there are no such conceptual objections to positing that these are each realised on different functional heads. Since we have argued throughout our book that all clauses contain a T constituent carrying an interpretable tense feature, in this section we concentrate on the question of whether there is evidence for positing the existence of an Aspect head in English, while in the next section we look at evidence for a possible Mood head.

A number of studies have postulated the existence of an Aspect head (independent of Tense) in a wide range of languages, including Russian (Tenny 1987), Greek (Alexiadou 1997), Spanish and Basque (Laka 1990), Breton and Welsh (Hendrick 1991), Scots Gaelic (Ramchand 1993), Irish (Guilfoyle 1994), Chinese (Borer 1993), and Egyptian Arabic (Diesing and Jelinek 1995). An attempt to argue that Aspect is projected as a separate functional head in English is found in Felser (1999a). She argues that in verb-particle structures such as *take the rubbish out*, the verb *take* originates immediately adjacent to the particle out (as *take out the rubbish*), but subsequently moves into the head Aspect position of an Aspect Phrase projection which is positioned above VP but below TP, so becoming separated from the particle, and resulting in structures such as:

(35)(a) [CP [C ] VP h e [T was] AspP [Asp taking] [V taking] out]]
(b) [CP [C ] [VP h e [T had] [AspP [Asp taken ] [V taken] out]]
(c) [CP [C ] [VP h e [T o ok] [AspP [Asp took ] [V took] out]]

The assumption that the verb *take* moves into a position above the V position in which it originates accounts for how the verb *take* comes to be separated from the particle *out*, while the assumption that movement is to a head below T accounts for why the verb cannot subsequently undergo T-to-C movement, e.g. in sentences such as:
Took he out the rubbish?

Felser argues that perception verb complements such as that bracketed below:

(37) We saw [him taking the rubbish out]

have the status of Aspect Phrases, so that the bracketed complement clause in (37) has the structure shown in highly simplified form below:

(38) We saw [\text{AsP} \text{him} [\text{Asp} \text{taking}] the rubbish out]

The verb take raises from the head V position of VP into the head Asp position of AspP, while its subject him raises to the specifier position within AspP and is assigned exceptional accusative case by the transitive verb saw.

A further potential source of evidence for the existence of an Aspect head in English comes from \textit{quotative inversion} structures like (39) below:

(39) ‘Sentences like this are called quotatives’ \textit{said} Leon

The relevant structures are called \textit{quotative} because they involve a direct quotation (the underlined quoted material being enclosed within inverted commas); they involve \textit{inversion} in the sense that the bold-printed main verb \textit{said} in (39) ends up positioned in front of its italicised subject Leon. Collins (1997), Collins and Branigan (1997) and Suñer (2000) argue that the italicised subject in such structures remains in situ in the specifier position within the verb phrase, and that the bold-printed verb moves to some higher head position above the VP in which it originates.

But what evidence is there that the subject remains in spec-V in quotative inversion structures like (39)? Part of the evidence comes from the syntax of \textit{floating quantifiers}. In structures in which the subject raises out of spec-V into spec-T in English, the moved subject in spec-T can serve as the antecedent for a floating quantifier like \textit{all/both/each} (i.e. for a quantifier which is positioned after the subject and forms a separate constituent, but is nonetheless interpreted as modifying the subject). We can illustrate this in terms of structures like (40) below:

(40)(a) The students \textit{should} all/both/each get distinctions
(b) The students \textit{all/both/each} got distinctions

In (40a) the bold-printed subject DP the students is in spec-T and hence precedes the auxiliary \textit{should}. The italicised floating quantifiers all/both/each are c-commanded by the subject DP the students, and are construed as modifying the subject DP. Hence, examples like (40a) tell us that a moved subject in spec-T can serve as the antecedent for a floating quantifier like all/both/each (i.e. for a quantifier which is positioned after the subject and forms a separate constituent, but is nonetheless interpreted as modifying the subject). We can illustrate this in terms of structures like (40) below:

(41)(a) ‘We must do this again’, the guests \textit{all} declared to Tony
(b) ‘*We must do this again’, declared the guests \textit{all} to Tony

In the uninvited structure (41a), the subject the guests occupies the canonical spec-T position associated with subjects, and hence can serve as the antecedent of the floating quantifier \textit{all}. Now, if the subject were also in spec-T in (41b), we’d again expect the quantifier \textit{all} to be able to be positioned after the subject. The fact that this is not possible leads Collins and Branigan to conclude that the subject in quotative inversion structures like (41b) remains in situ in spec-V.

However, the assumption that the postverbal subject in quotative inversion structures like (39) and (41a) remains in situ in spec-V raises the question of where the verb and the quoted material (both of which end up in front of the subject) move to, since if they remained in situ within the verb phrase, they would be expected to follow the subject. Collins (1997) argues that the quoted material moves to spec-T (a position which is normally occupied by the subject, but which is available for some other constituent to move into if the subject remains in spec-V). As for where the verb moves to, Suñer (2000) argues that it does not move to T (since T is not strong enough to attract main verbs to move to T in present-day English), but rather moves to the head Asp (= Aspect) position of an AspP (= Aspect Phrase) projection which is positioned below T but above VP. On this view, a sentence like (39) would have the structure (42) below (with arrows showing movement, and \textit{t} indicating trace copies of moved constituents):

(42)
Sentences like this are called quotatives

Suñer notes that an interesting prediction made by the assumption that the verb undergoes short verb movement to Asp (rather than long verb movement to T) is that inversion of verb and subject will be blocked in structures containing an aspectual auxiliary like perfect have or progressive be, and she notes that contrasts like that in (43) below provide empirical support for her claim:

(43)(a) ‘What time is it?’ John was asking of Mona
(b) *‘What time is it?’ was John asking of Mona
(c) *‘What time is it?’ was asking John of Mona

If finite aspectual auxiliaries originate in Asp and raise to T, was will originate in Asp in structures like (43) and hence will block movement of the verb asking to Asp – so accounting for the ungrammaticality of quotative inversion in structures like (43b/c).

While evidence of the kind outlined in this section in support of positing an independent Aspect head in English is suggestive, it should be pointed out that it is far from conclusive. For example (as we will see later), it turns out that a split projection analysis of verb phrases can handle the syntax of the kind of verb-particle structures discussed by Felser, without the need for positing an independent Aspect head. And while quotative inversion structures are fascinating, they are archaic in character and have idiosyncratic properties which are poorly understood, so that it may be unwise to base the postulation of an Aspect head on a particular analysis of an obsolescent inversion structure. (See Alexiadou and Anagnostopoulou 2001 for discussion of other inversion structures.) At any rate, we shall simplify our exposition throughout the rest of the book by ignoring the possibility that English may have an Aspect head. (On the possibility that small clauses like that bracketed in I consider [Mary (as) unsuitable for the post] may contain an Aspect Projection, see Jiménez 2000a,b. For further discussion of the syntax and semantics of Aspect, see the collection of papers in Verkuyl, de Swart and van Hout 2005).

8.5 Split TP: Mood projection

In this section, we turn to look at evidence put forward by Schütze (2004) that English finite clauses contain a further kind of inflectional head which marks the property of (indicative, subjunctive or imperative) Mood (abbreviated to M). Schütze claims that there is empirical evidence in support of positing an MP (Mood Phrase) projection between TP and CP, so that canonical negative clauses are of the form CP+MP+TP+NEGP+VP. (A complication which we will overlook here is Schütze’s assumption that non-negative clauses contain a positive counterpart of NegP.) He maintains that M is the locus of modals and mood morphemes: more specifically, he posits that M can contain either a modal auxiliary stem (e.g. can/will/must), or an (indicative or subjunctive) mood morpheme, below denoted as ø

By contrast, T is the locus of tense affixes, in the sense that ‘The only elements
generated under T are tense affixes’ (Schütze 2004, p.507). T can contain either a strong affix which acquires a host by triggering movement of a lexical verb from V to T, or a weak affix which acquires a host by raising to attach to an auxiliary in M. Neg is the locus of the negative particles not/’n’t, and Schütze posits that these are generated in the head Neg position of of NegP (and not in the specifier position of NegP as we assumed in §4.7): he also assumes that Neg is not a strong head and so blocks a lexical verb from raising from V to T (because direct movement of the verb from V to T is barred by the Head Movement Constraint, and successive-cyclic movement of the verb from V through Neg into T is barred by virtue of Neg not being strong and so being unable to attract V to move to Neg); however, a clitic negative like ’n’t can itself cliticise to an M head above it. Subject-auxiliary inversion is treated as M-to-C movement, so only a constituent in M (not one in T) can undergo inversion and raise to C: subjects are also assumed to raise to spec-M rather than to spec-T. Schütze argues that his system obviates the need for positing the traditional Affix Lowering operation (by which an affix in T is lowered onto a verb in V), and that Head Movement is motivated only by the requirement for an affix to be attached to an appropriate kind of head (a strong affix triggering raising of a head below it, and a weak affix itself raising to attach to a head above it).

How Schütze’s system works can be illustrated (in a simplified fashion) as follows. Consider first a simple indicative clause structure like (44) below containing a modal such as will and a present tense affix AfPRES (and with the subject he originating as the specifier of the verb help and raising to become the specifier of the modal will – as shown by the arrow):

(44) CP
   /
  /  
 C    MP
     /
    /
   PRN M'  TP
         /
        /
       he   M will+AfPRES
            /
           /
          T AfPRES
             /
            /
           PRN V'
               /
              /
             he
              /
             /
            V help PRN you

If the affix in T is weak (and so finds a host by attaching to the head immediately above it), it will raise to attach to the modal stem will in M, so forming:

(45) [CP [C φ] [MP he [M will+AfPRES] [TP [T AfPRES] [VP he [V help] you]]]]

The modal is spelled out as will if (as here) the affix is present tense, and as would if it is past tense. The M constituent containing will+affix can then undergo subsequent movement to adjoin to a null interrogative C in a main-clause question structure such as:

(46) [CP whether [C will+AfPRES+φ] [MP he [M will+AfPRES] [TP [T AfPRES] [VP he [V help] you]]]]

so ultimately deriving Will he help you? By contrast, if the T-affix in (44) were strong, it would attract the verb help to adjoin to it, so leaving the modal will without a tense affix (and thereby causing the derivation to crash, because the PF component has no spellout for a tenseless form of a modal like will).

Now consider what happens in an auxiliariless indicative clause structure such as the following:

(47) [CP [C φ] [MP they [M φIND] [TP [T AfPRES] [VP they [V like] you]]]]

If the affix in T is strong in (47), it will trigger movement of the the verb like from V to T, so forming the structure:

(48) [CP [C φ] [MP they [M φIND] [TP [T like+AfPRES] [VP they [V like] you]]]]

Since the requirement for like to have a tense affix and for the tense affix to be attached to an overt verb stem is satisfied by raising the verb from V to T, no further movement is possible in this kind of structure
(the null indicative mood morpheme in M not being a strong affix). By contrast, if the T-affix is weak in (47), it will raise to attach to the null mood morpheme in M, so forming the structure:

(49) \[ \text{[CP [c \emptyset] [MP they [M\emptyset \text{IND} + \text{Af} \text{PRES}] [TP [T \text{Af} \text{PRES}] [VP they [V like] you]]]} \]

Since the resulting indicative M constituent contains no verbal stem, it is spelled out as an appropriately inflected form of supportive DO, so deriving *They do like you*.

Now consider a negative indicative clause such as the below:

(50) \[ \text{[CP [c \emptyset] [MP he [M\emptyset \text{IND} + \text{Af} \text{PRES}] [TP [T \text{Af} \text{PRES}] [NegP [Neg not] [VP he [V appreciate] you]]]} \]

If the affix in T is strong here, the verb *appreciate* cannot raise from V to attach to the affix in T because single-step movement is blocked by the Head Movement Constraint, and multiple-step movement is blocked by the fact that Neg is not a strong head and so cannot attract a lexical verb to attach to it: in either eventuality, the derivation will crash. But if the affix in T is weak, it will raise to attach to the indicative mood head, so forming the structure:

(51) \[ \text{[CP [c \emptyset] [MP he [M\emptyset \text{IND} + \text{Af} \text{PRES}] [TP [T \text{Af} \text{PRES}] [NegP [Neg not] [VP he [V appreciate] you]]]} \]

If (as here) M contains no verbal stem, the INDICATIVE MOOD+PRESENT TENSE morphemes in M will be spelled out as an appropriately inflected form of DO, so deriving *He does not appreciate you*.

Schütze claims that a significant theoretical advantage of his split TP analysis is that it dispenses with the need for positing the traditional Affix Lowering operation by which an affix in T is lowered onto a verb in V – an operation which has sometimes been claimed to be of dubious status because it involves a lowering operation whereas other morphosyntactic operations typically involve raising. However, while the prospect of getting rid of Affix Hopping might seem a welcome one, it is not clear that Schütze entirely succeeds in attaining this goal. In this connection, consider a structure like (52) below in which T contains a strong affix which triggers raising of the verb from V to T:

(52) \[ \text{[CP [c \emptyset] [MP he [M\emptyset \text{IND} + \text{Af} \text{PRES}] [TP [T like + \text{Af} \text{PRES}] [VP he [V like] you]]]} \]

An apparent problem which arises here is that in order to determine whether to spell out the verb as *likes* or *like*, the PF component needs to ‘know’ whether the verb is indicative, subjunctive or imperative in mood, since `-s` is an indicative-mood inflection. However, the mood feature is marked on M rather than on T. Consequently, some way needs to be found of marking the verb in T for mood. We clearly cannot raise the verb from T to M, since this would wrongly predict that the verb would be eligible to undergo M-to-C movement in interrogatives (i.e. auxiliary inversion). The only possibility would seem to be to lower the null indicative mood morpheme from M onto C via Affix Lowering, so deriving the structure (53) below:

(53) \[ \text{[CP [c \emptyset] [MP he [M\emptyset \text{IND} + \text{Af} \text{PRES}] [TP [T like + \text{Af} + \emptyset \text{IND}] [VP he [V like] you]]]} \]

The verb could then be spelled out as the third person singular present indicative form *likes*. However, such an analysis would undermine Schütze’s argument that his analysis dispenses with the need for Affix Lowering. Moreover, the problem is compounded if M is the locus of the (third person singular) agreement features in the clause, as will be the case if movement of the subject out of VP into spec-MP is contingent on agreement between M and the subject: then not only mood features but also agreement features will have to be lowered from M onto the verb in T by Affix Hopping.

A further potential problem which arises under Schütze’s analysis is that derivations will crash if the ‘wrong’ choice of items is made in the lexical (sub)array. For example, as noted earlier, a structure like (44) will crash if T contains a strong (rather than a weak) affix, because modal *will* is left without a tense affix to attach to it, and the PF component has no spellout for tenseless modals. A related problem of over-generation (i.e. generating sentences which are ungrammatical) arises in relation to the fact that Schütze’s analysis generates structures like (49), in spite of the fact that sentences like *They do like you* are ungrammatical in standard varieties of English unless DO is emphatic. To get round this, Schütze invokes a language-specific economy condition suggested by Emonds (1994, p.168) which amounts to ‘Use as few words as possible’ – a principle which is claimed to rule out *They do like you* on the grounds that it has the more economical counterpart *They like you*. However, the theoretical and empirical status of this economy condition is unclear, since (e.g.) it wrongly predicts that *He doesn’t have any money* should be ruled out in favour of its more economical variant *He hasn’t any money* (and yet this is not the case in varieties of English like my own British one which allow both types of sentence).
In short, Schütze’s postulation of an M head independent of T leads to crashes and overgeneration, and this poses a potential problem if we follow Chomsky (2006, p.2) in positing that grammars should meet a condition of ‘efficient computation’. Moreover, Schütze’s analysis would seem to still require the Affix Lowering operation which it was designed to dispense with. Thus, while the idea that Mood should head a separate projection from Tense is far from implausible, the particular implementation of this idea in Schütze’s analysis of English seems problematic, and hence we will not pursue this possibility any further in the remainder of the book. Instead, in the rest of this chapter we will look at work which has become widely accepted arguing that verb phrases should be split into at least two distinct projections.

8.6 Split VP: Ergative structures

Having looked at evidence that CP and TP can be split into a number of different projections, we now turn to look at evidence arguing that VPs should be split into two distinct projections – an outer VP shell and an inner VP core. For obvious reasons, this has become known as the VP shell (or split VP) analysis.

The sentences we have analysed so far have generally contained simple verb phrases headed by a verb with a single complement. Such single-complement structures can easily be accommodated within the binary-branching framework adopted here, since all we need say is that a verb merges with its complement to form a (binary-branching) V-bar constituent, and that the resulting V-bar merges with its subject to form a binary-branching VP constituent. However, a particular problem for the binary-branching framework is posed by three-place predicates like those italicised in (54) below which have a (bold-printed) subject and two (bracketed) complements:

\[(54)\]

(a) He rolled [the ball] [down the hill]  
(b) He filled [the bath] [with water]  
(c) He broke [the vase] [into pieces]  
(d) They withdrew [the troops] [from Ruritania]

If we assume that complements are sisters to heads, it might seem as if the V-bar constituent headed by rolled in (54a) has the structure (55) below:

\[(55)\]

However, a structure such as (55) is problematic within the framework adopted here. After all, it is a ternary-branching structure (V-bar branches into the three separate constituents, namely the V rolled, the DP the ball and the PP down the hill), and this poses an obvious problem within a framework which assumes that the merger operation which forms phrases is an inherently binary operation which can only combine constituents in a pairwise fashion. Moreover, a ternary-branching structure such as (55) would wrongly predict that the string the ball down the hill does not form a constituent, and so cannot be coordinated with another similar string (given the traditional assumption that only identical constituents can be conjoined) – yet this prediction is falsified by sentences such as:

\[(56)\] He rolled the ball down the hill and the acorn up the mountain

How can we overcome these problems?

One answer is to suppose that transitive structures like He rolled the ball down the hill have a complex internal structure which is parallel in some respects to causative structures like He made the ball roll down the hill (where MAKE has roughly the same meaning as CAUSE). On this view the ball roll down the hill would serve as a VP complement of a null causative verb (which can be thought of informally an invisible counterpart of MAKE). We can further suppose that the null causative verb is affixal in nature, and so triggers raising of the verb roll to adjoin to the causative verb, deriving a structure loosely paraphrasable as He made+roll [the ball roll down the hill], where roll is a null copy of the moved verb roll. We could then say that the string the ball down the hill in (56) is a VP remnant headed by a null copy of the moved verb roll. Since this string is a VP constituent, we correctly predict that it can be co-ordinated with another VP remnant like the acorn up the mountain – as is indeed the case in (56).

Analysing structures like roll the ball down the hill as transitive counterparts of intransitive structures is by no means implausible, since many three-place transitive predicates like roll can also be used as two-
place intransitive predicates in which the (italicised) DP which immediately follows the (bold-printed) verb in the three-place structure functions as the subject in the two-place structure – as we see from sentence-pairs such as the following:

(57)(a) They will roll the ball gently down the hill  
(b) The ball will roll gently down the hill

(58)(a) He filled the bath with water  
(b) The bath filled with water

(59)(a) He broke the vase into pieces  
(b) The vase broke into pieces

(60)(a) They withdrew the troops from Ruritania  
(b) The troops withdrew from Ruritania

(61)(a) They closed the store down  
(b) The store closed down

(62)(a) They moved the headquarters to Brooklyn  
(b) The headquarters moved to Brooklyn

(Verbs which allow this dual use as either three-place or two-place predicates are sometimes referred to as ergative predicates.) Moreover, the italicised DP seems to play the same thematic role with respect to the bold-printed verb in each pair of examples: for example, the ball is the THEME argument of roll (i.e. the entity which undergoes a rolling motion) both in (57a) They will roll the ball down the hill and in (57b) The ball will roll down the hill. Evidence that the ball plays the same semantic role in both sentences comes from the fact that the italicised argument is subject to the same pragmatic restrictions on the choice of expression which can fulfil the relevant argument function in each type of sentence: cf.

(63)(a) The ball/the rock/the theory/sincerity will roll gently down the hill  
(b) They will roll the ball/the rock/the theory/sincerity gently down the hill

If principles of UG correlate thematic structure with syntactic structure in a uniform fashion (in accordance with Baker’s (1988) Uniform Theta Assignment Hypothesis/UTAH), then it follows that two arguments which fulfil the same thematic function with respect to a given predicate must be merged in the same position in the syntax.

An analysis of (57a) within the spirit of UTAH would be the following. Let us suppose that the DP the ball is the ‘closest’ internal argument of the verb roll in both transitive and intransitive uses, and hence is merged as the complement of the verb – as is suggested by the fact that (like typical complements) it can be incorporated into the verb in a compound such as ball-rolling (cf. Ball-rolling can be dangerous). Let us further suppose that the second internal argument of the verb roll (namely the PP down the hill) is merged as its specifier. Finally let’s also suppose that adverbs like gently are VP-adjuncts, and that adjunction is a different kind of operation from merger, in that (e.g.) a verb theta-marks an argument expression which merges with it, but does not theta-mark an expression which adjoins to one of its projections; and arguments but not adjuncts undergo operations like agreement. (See Stepanov 2001 and Chomsky 2001 for technical accounts of differences between adjunction and merger.) Given these assumptions, the VP in (57a) will have the structure shown in (64) below, with the ball being the complement of the VP, down the hill being its specifier and gently its adjunct:

(64)

(The notational convention assumed here is that all intermediate projections of V are labelled V-bar/ V’.) Adapting ideas put forward by Larson (1988, 1990), Hale and Keyser (1991, 1993, 1994) and Chomsky (1995), we will assume that the VP in (64) is subsequently merged as the complement of an abstract causative light verb (v) – i.e. a null verb with much the same causative interpretation as the verb MAKE (so that They will roll the ball gently down the hill has a similar interpretation to They will make the ball roll gently down the hill). Let’s also suppose that this causative light verb is merged with the subject they (which is assigned the θ-role of AGENT argument of the causative light verb), so forming the light verb phrase (= vP) structure shown below (lower-case letters being used to denote the light verb):
Given our assumption in chapter 7 that structural case-marking involves agreement, we will further assume that (in transitive clauses) the head V of VP carries abstract agreement properties and agrees with and assigns accusative case to the closest phi-complete (pro)nominial with an unvalued case feature within its c-command domain: this means that V agrees (invisibly) with and assigns accusative case to the DP the ball. Let us further assume that just as T has an EPP feature which enables it to trigger movement to the outer edge of TP of a goal which it agrees with and assigns nominative case to, so too V has an EPP feature which allows it to trigger movement to the outer edge of VP of a goal which it agrees with and assigns accusative case to. Finally, let us follow Chomsky (2006) in positing that a light-verb is always a strong affix, and hence triggers movement of the lexical verb (roll) to adjoin to the light verb. These various operations will then derive the structure shown below (with arrows showing movement):

(66)  
\[
(65) \quad \begin{array}{c}
\text{vP} \\
\text{PRN} \\
\text{they} \\
\text{v} \\
\phi \\
\text{ADV} \\
gently \\
\text{PP} \\
down \text{the hill} \\
\text{V} \\
\text{DP} \\
\text{roll} \\
\text{the ball}
\end{array}
\]

Since English is a language which has suffixal derivational and inflectional morphemes and has head-final word order for compound words, we can assume in (66) that the causative light-verb is suffixal – like its overt counterpart in Turkish or Japanese.

The vP in (66) then merges with the T constituent will, the subject they raises to spec-T, and the resulting TP is merged with a null declarative complementiser, forming the structure (67) below:

(67)  
\[
(66) \quad \begin{array}{c}
\text{CP} \\
\text{C} \\
\phi \\
\text{PRN} \\
\text{They} \\
\text{T} \\
\text{will} \\
\text{vP} \\
\text{PRN} \\
\text{they} \\
\text{v'} \\
\text{roll the ball gently down the hill}
\end{array}
\]
The internal structure of v-bar is not shown because it is given in (66) above. The analysis in (67) correctly specifies the word-order in (57a) They will roll the ball gently down the hill. (See Stroik 2001 for arguments that do is used to support a null light-verb in elliptical structures such as John will roll a ball down the hill and Paul will do so as well.)

Although the adverb gently follows the object the ball as in (68a) below, it can alternatively be positioned in front of the verb roll – as we see from (68b):

(68)(a) They will roll the ball gently down the hill (= 57a)
(b) They will gently roll the ball down the hill

In the use illustrated in (68b), gently serves as an adjunct to the vP headed by the light verb, so that (68b) has the structure shown in simplified form below:

(69) [CP [C ø] [TP They [T will] [vP gently [they [v roll] the ball]]]]

The different positions occupied by the adverb gently in (68a) and (68b) reflect a subtle meaning difference between the two sentences: (68a) means that the rolling motion itself was gentle, whereas (68b) means that the action which initiated the rolling motion was gentle.

A light-verb analysis also offers us an interesting account of adverb position in sentences like:

(70)(a) He had deliberately rolled the ball gently down the hill
(b) *He had gently rolled the ball deliberately down the hill

Let’s suppose that deliberately (by virtue of its meaning) can only be an adjunct to a projection headed by an agentive verb (i.e. a verb whose subject has the thematic role of AGENT). If we suppose (as earlier) that the light-verb [, ø] is a causative verb with an AGENT subject, the contrast in (70) can be accounted for straightforwardly: in (70a) deliberately is contained within a vP headed by a null agentive causative light-verb; but in (70b) it is contained within a VP headed by the nonagentive verb roll. (The verb roll is a nonagentive predicate because its subject has the θ-role THEME, not AGENT.) We can then say that adverbs like deliberately are vP-adjuncts which adjoin to a vP headed by an agentive light-verb, but not to a VP headed by a lexical verb.

This in turn might lead us to expect to find a corresponding class of VP adverbs which can adjoin to VP but not to vP. In this connection, consider the following contrasts (adapted from Bowers 1993, p.609):

(71)(a) Mary jumped the horse perfectly over the last fence
(b) *Mary perfectly jumped the horse over the last fence

Given the assumptions made here, the derivation of (71a) would be parallel to that in (64-67), while the derivation of (71b) would be parallel to that in (69). If we assume that the adverb perfectly (in the relevant use) can function only as a VP-adjunct, the contrast between (71a) and (71b) can be accounted for straightforwardly: in (71a), perfectly is a VP-adjunct, whereas in (71b) it is illicitly used as a vP adjunct (in violation of its status as a VP-adjunct).

8.7 Split VP: other transitive structures

As we have seen, the VP shell analysis outlined here provides an interesting solution to the problems posed by ergative verbs when they are used as transitive verbs with two complements. However, the problems posed by transitive verbs which take two complements arise not only with ergative verbs which have transitive and intransitive counterparts (like those in (57-62) above), but also with two-complement transitive verbs like those bold-printed below (their complements being bracketed):

(72)(a) They will load [the truck] [with hay]
(b) He gave [no explanation] [to his friends]
(c) They took [everything] [from her]
(d) Nobody can blame [you] [for the accident]

Verbs like those in (72) cannot be used intransitively, as we see from the ungrammaticality of:

(73)(a) *The truck will load with hay
(b) *No explanation gave to his friends
(c) *Everything took from her
(d) *You can blame for the accident

However, it is interesting to note that in structures like (72) too we find that adverbs belonging to the same class as gently can be positioned either before the verb or between its two complements: cf.
This suggests that (in spite of the fact that the relevant verbs have no intransitive counterpart) a split projection analysis is appropriate for structures like (72) too. If so, a sentence such as (72a) will have the structure shown in simplified form in (75) below (with arrows showing movements which take place):

(75) CP
C
PRN
They
TP
'T
will
vP
they
v
VP
load+Ø
DP
the truck
ADV
carefully
PP
with hay
V
load
DP
the truck

We can then say that V agrees with, assigns accusative case to and triggers raising to the outer edge of VP of the object DP *the truck*. Because the verb *load* raises to v, it comes to precede both the raised direct object *the truck* and the VP-adverb *carefully*. The syntax of (74b) differs only in that *carefully* is a vP adverb in (74b), whereas it is a VP-adverb in (74a). If we suppose that verbs like *load* are essentially affixal in nature (in the sense that they must adjoin to a null causative light verb with an AGENT external argument) we can account for the ungrammaticality of intransitive structures such as (73a) *The truck will load with hay.*

A key assumption made in our analysis of transitive verbs which have both a DP and a PP complement is that the direct DP originates below the PP but subsequently raises to a position above PP. Some evidence in support of the claim that direct object complements originate below PP complements comes from sentence pairs such as the following:

(76)(a) He reported *to the police* that there had been a robbery
(b) He reported *the robbery* to the police

In (76a), the direct object complement is a clause (more specifically, a CP). Given that CPs are syntactically relatively inert and tend not to move around much, this suggests that the position occupied by the underlined CP in (76a) is likely to be the initial position for a direct (i.e. non-prepositional) object – i.e. the position in which direct objects initially occupy when they are first introduced into the derivation. Note that there is also an important theoretical reason why the object DP *the robbery* must originate below PP in (76b): this is because the direct object has to be case-marked by the verb *report*, and this requires the DP object to originate in a position where it is c-commanded by the verb. If DP originates as the complement of V, it will be c-commanded (and so can be case-marked) by V; but if DP originates as the specifier of V, it will not be c-commanded (and cannot be case-marked) by V and hence the derivation will crash, because the case feature on DP will remain unvalued.

The split VP analysis outlined above can be extended from predicates like *load* which have nominal and prepositional complements to so-called *resultative predicates* which have nominal and adjectival complements – i.e. to structures such as those below:
In (77a), the verb *turn* originates in the head V position of VP, with the DP *the litmus paper* as its complement and the adjective *red* as its specifier. However, V agrees with and assigns accusative case to the DP *the litmus-paper*, and also attracts it to move to the outer edge of VP. The light-verb attracts the verb *turn* to raise from V to v, so that *turn* comes to precede its direct object *the litmus paper*. (I leave you to work out remaining details of the derivation. For alternative analyses of resultative structures, see Keyser and Roeper 1992, Carrier and Randall 1992, and Oya 2002.)

Moreover, the split VP analysis can also be extended to deal with verb-particle structures such as the following:

(78)(a) He will pour the whisky slowly out  
(b) He will pour the whisky out slowly  
(c) He will pour out the whisky slowly

Let us suppose that the DP *the whisky* originates as the complement of the V *pour*, that the particle *out* originates as its specifier, and the adverb *slowly* is an adjunct to the VP thereby formed. The resulting VP is merged with a null causative light verb forming a v-bar which in turn is merged with its AGENT subject *he* to form the vP below:

![Diagram of the derivation of (78a)](image)

The transitive verb *pour* agrees with and assigns accusative case to the DP *the whisky*, and attracts the DP to raise to the outer edge of vP. The affixal light-verb attracts the verb *pour* to adjoin to it, so forming the structure shown below (with arrows showing movement of the relevant constituents):

![Diagram of the derivation of (78b)](image)

The resulting vP subsequently merges with the T-auxiliary *will* and this agrees with and case-marks the subject, and attracts it to move to spec-TP. The resulting TP is in turn merged with a null declarative C, so deriving the structure associated with (78a) *He will pour the whisky slowly out*. The derivation of (78b) *He will pour the whisky out slowly* differs from that shown above only in that *slowly* is adjoined to the
V-bar pour the whisky (or alternatively, \textit{slowly} is a VP-adjunct spelled out on the right-hand edge of VP). And the derivation of (78c) \textit{He will pour out the whisky slowly} differs further in that the particle \textit{out} is adjoined to the verb in \textit{v}. What our brief discussion here illustrates is that the syntax of verb-particle structures can be handled within a split VP framework without the need to posit an Aspect head projected in the syntax.

In this section and the last, we have so far presented a shell analysis of three-place transitive predicates. But this raises interesting questions about how we deal two-place transitive predicates (which have subject and object arguments) like \textit{read} in (81) below:

(81) He will read the book

Chomsky (1995) proposes a light-verb analysis of two-place transitive predicates under which (81) would (at the end of the vP cycle) have a structure along the lines of (82) below (with the arrow showing movement of the verb \textit{read} from V to adjoin to a null light-verb in \textit{v}):

\[
\text{vP} \\
\text{PRN} \\
\text{he} \\
\text{v} \\
\text{V} \\
\text{DP} \\
\text{read+}\emptyset \\
\text{read} \\
\text{the book}
\]

That is, \textit{read} would originate as the head V of VP (agreeing with and assigning accusative case to its object the book), and would subsequently raise to adjoin to an affixal agentive light-verb \emptyset, which has a meaning paraphrasable as 'perform the action of'. If we suppose that a transitive \textit{V} only triggers movement of a nominal which it case-marks to the edge of VP if the nominal in question is not already the highest non-head constituent within VP, then there will be no possibility of raising the DP the book in (82) to become the specifier of VP because this DP is already the highest non-head constituent within VP by virtue of being the \textit{only} non-head constituent within VP.

Chomsky's light-verb analysis of two-place transitive predicates can be extended in an interesting way to handle the syntax of a class of verbs which are known as \textbf{unergative predicates}. These are verbs like those italicized in (83) below which have agentive subjects, but which appear to have no complement:

(83)(a) Shall we lunch? (b) Let's party! (c) Don't fuss!
(d) Why not guess? (e) He apologised (f) She overdosed

Such verbs pose obvious problems for our assumption in the previous chapter that agentive subjects originate as \textit{specifiers} and merge with an intermediate verbal projection which is itself formed by merger of a verb with its complement. The reason should be obvious – namely that unergative verbs like those italicised in (83) appear to have no complements. However, it is interesting to note that unergative verbs often have close paraphrases involving an overt light verb (i.e. a verb such as \textit{have/make/take} etc. which has little semantic content of its own in the relevant use) and a nominal complement: cf.

(84)(a) Shall we have lunch (b) Let's have a party! (c) Don't make a fuss!
(d) Why not make a guess? (e) He made an apology (f) She took an overdose

This suggests a way of overcoming the problem posed by unergative verbs – namely to suppose (following Baker 1988 and Hale and Keyser 1993) that unergative verbs are formed by incorporation of a complement into an abstract light verb. This would mean (for example) that the verb \textit{lunch} in (84a) is an implicitly transitive verb, formed by incorporating the noun \textit{lunch} into an abstract light verb which can be thought of as a null counterpart of \textit{have}. Since the incorporated object is a simple noun (not a full DP or QP), we can assume (following Baker 1988) that it does not carry case. The VP thereby formed would serve the complement of an abstract light verb with an external argument (the external argument being \textit{we} in the case of (84a) above). Under this analysis, unergatives would in effect be transitives with an incorporated object: hence we can account for the fact that (like transitives) unergatives require the use of the perfect auxiliary \textit{HAVE} in languages (like Italian) with a \textit{HAVE/BE} contrast in perfect auxiliaries.
8.8 Split VP: Exceptional Case Marking and Object Control

So far, we have looked at transitive structures in a transitive verb assigns accusative case to one of its own internal arguments. However, this raises the question of how we deal with Exceptional Case Marking/ECM structures in which a verb assigns accusative case to the subject of a defective clause. In this connection, consider the following ECM structures:

(85)(a) The DA will prove the witness conclusively to have lied (adapted from Bowers 1993, p.632)
(b) I suspect him strongly to be a liar (Authier 1991, p.729)
(c) I’ve believed Gary for a long time now to be a fool (Kayne 1984, p.114)
(d) I have found Bob recently to be morose (Postal 1974, p.146)

In terms of the earlier analysis of ECM structures which we presented in §3.9, the bold-printed nominal would be in spec-T and would be assigned exceptional accusative case by the adjacent underlined transitive verb. However, the problem posed by the assumption that the bold-printed accusative nominal is the subject of an infinitival TP complement is that it is followed by an italicised adverb which modifies the underlined main-clause verb. If we assume that the italicised adverb is contained within the main-clause VP, it follows that the bold-printed accusative subject of the infinitive complement must also be inside the VP. How can this be? The answer suggested in work by Postal (1974), Johnson (1991), Koizumi (1993, 1995), and Runner (1998) and adopted in a revised form in Chomsky (2005b) is that the subject of the ECM clause raises up to become the object of the main clause by an operation traditionally termed (subject-to-) object-raising.

To see how the object-raising analysis of ECM structures can be handled within the framework used here, let’s look at the derivation of (85a). Let’s suppose we have reached a stage of derivation at which we have formed the infinitival TP *the witness to have lied*. This TP is merged with the verb *prove* to form the V-projection *prove the witness to have lied*. The adverb *conclusively* is then adjoined to this V-projection to form the VP *conclusively prove the witness to have lied*. The resulting structure is merged with a null light verb, forming the v-projection *Ø conclusively prove the witness to have lied*, and this in turn is merged with the DP *the DA* to form a vP. The lexical verb *prove* (by virtue of being transitive) agrees with, assigns accusative case to and attracts the c-commanded DP *the witness* to move to spec-V. The verb *prove* is in turn attracted by the affixal light verb to move from V to v – as shown by the arrows below:

(86)

The vP in (86) is then merged with the T-auxiliary *will*, which attracts the DP *the DA* to move to spec-T, so forming a TP which is merged with a null declarative complementiser to form the CP shown in skeletal form below (in which only overt constituents of vP are shown):

(87) \[ CP [c Ø] [TP the DA [T will] [vP [v prove] the witness conclusively to have lied]]\]

The analysis in (87) accounts for how the accusative subject of the infinitive complement comes to be positioned in front of an adverb modifying the verb in the main clause, and how the accusative DP comes to be adjacent to the transitive verb *prove*.

An interesting complication arises in structures like (88) below where the subject of the ECM clause is expletive *there*:

(88)
The DA will prove *there* conclusively to have been a conspiracy.

Given that we analysed expletive *there* in §7.6 as carrying only a third-person feature, the verb *prove* will agree in person with *there* and in person and number with a *conspiracy*, and will assign accusative case to the indefinite nominal a *conspiracy*. It will also attract the closest (pro)nominal expression it agrees with (namely expletive *there*) to move to the outer edge of VP. Consequently, expletive *there* will end up in a position above (and hence be spelled out to the left of) the VP-adverb *conclusively*.

At first sight, sentences such as the following might also seem to be ECM structures, and hence to have a derivation parallel to that of ECM structures like (85):

(89)
(a) The FBI *advised* us strongly to bug Macdonalds
(b) *What decided* you eventually to take syntax?
(c) *She persuaded* me to try phoneme-free phonology
(d) *He told* her firmly to turn up to work on time in future
(f) *Someone should remind* him again to activate his memory bank

However, there are significant differences between a typical ECM verb like *prove* and the kind of verbs found in (89). For example, an ECM verb often allows a paraphrase in which the ECM verb has a finite clause complement – like the italicised *that*-clause in the (b) example below:

(90)
(a) The DA proved the witness to have lied
(b) The DA proved *that the witness had lied*

A structure like (90b) suggests that *prove* is a two-place predicate whose two arguments are the subject DP *the DA* and the clausal complement *that the witness had lied*. By contrast, structures like those in (89) are typically paraphrasable by a sentence in which the verb has both a (bold-printed) nominal complement and an (italicised) clausal complement – as we can see in relation to the examples below:

(91)
(a) The FBI *advised us strongly to bug Macdonalds*
(b) The FBI *advised us strongly that we should bug Macdonalds*

This suggests that the verb *advise* is a 3-place predicate whose three arguments are the subject DP *the FBI*, the pronominal complement *us* and a clausal complement. In (91b), the clausal complement is a finite CP, whereas in (91a) it is a non-finite CP with a PRO subject controlled by the object pronoun *us* – hence, verbs used in structures like (91a) are referred to as Object Control (OC) predicates.

A further difference between ECM and OC predicates can be illustrated in terms of the following contrast:

(92)
(a) The DA proved there to be bugs in the burgers
(b) *The DA advised there to be bugs in the burgers*

(92a) is fine because *prove* is a two-place ECM predicate, and expletive *there* originates as the subject of the infinitival TP *there to be bugs in the burgers* and so is not an argument of *prove* (though *there* subsequently raises up to become the object of *prove*). (92b) is ungrammatical because *advise* is a 3-place OC predicate, with the noun or pronoun expression following *advise* serving as an EXPERIENCER argument of *advise*. Because an EXPERIENCER argument typically has to be an expression denoting a rational being, it follows that the object of *advise* cannot be an expletive pronoun.

Having looked at how we can tell OC predicates from ECM predicates, let’s examine the derivation of a typical OC structure like (89a) *The FBI advised us strongly to bug Macdonalds*. (To simplify our discussion, we focus on the derivation of the main clause and ignore that of the complement clause *φ PRO to bug Macdonalds*, this being an infinitival CP with a null complementiser and a null PRO subject). The verb *advise* is merged with its direct object complement *us* to form the V-bar *advise us*. This V-bar is then merged with the CP *φ PRO to bug Macdonalds*, to derive a larger V-projection to which the VP-adverb *strongly* is in turn adjoined. The resulting VP is subsequently merged with an affixal light verb, forming a v-bar constituent which in turn merges with its AGENT subject *the FBI*, thereby deriving the structure shown below:
8.9 A split VP analysis of intransitive clauses

Thus far, we have argued that clauses with AGENT or EXPERIENCER subjects have a shell structure comprising an inner VP headed by a lexical verb and an outer vP headed by a light verb. However, we will now go on to present evidence that a split projection analysis is also appropriate for intransitive clauses. We begin by looking at clauses containing an unaccusative verb.

In §6.5, we noted Burzio’s claim that the arguments of unaccusative predicates originate as their complements. An immediate problem posed by Burzio’s assumption is how we deal with two-place unaccusative predicates which take two arguments. In this connection, consider unaccusative imperative structures such as the following in (dialect A of) Belfast English (See Henry 1995: note that youse is the plural form of you – corresponding to American English y’all):

(95)(a) Go you to school! (b) Run youse to the telephone! (c) Walk you into the garden!

If postverbal arguments of unaccusative predicates are in situ complements, this means that each of the verbs in (95) must have two complements. But if we make the traditional assumption that complements are sisters of a head, this means that if both you and to school are complements of the verb go in (95a), they must be sisters of go, and hence the VP headed by go must have the (simplified) structure (96) below:
However, a ternary-branching structure such as (96) is obviously incompatible with a framework such as that used here which assumes that the merger operation by which phrases are formed is inherently binary.

Since analysing unaccusative subjects in such structures as underlying complements proves problematic, let’s consider whether they might instead be analysed as specifiers. On this view, we can suppose that the inner VP core of a Belfast English unaccusative imperative structure such as (95a) *Go you to school!* is not (96) above, but rather (97) below:

(97)  
```
  VP
 /     \
PRN   V'
  
  you
  
V     PP
  go        to school
```

We can then say that it is a property of unaccusative predicates that all their arguments originate within VP. But a problem posed by a structure like (97) is that it provides us with no way of accounting for the fact that unaccusative subjects like *you* in (95a) *Go you to school* surface postverbally. How can we overcome this problem? One answer is the following. Let us suppose that VPs like (96) which are headed by an unaccusative verb are embedded as the complement of a null light verb, and that the unaccusative verb raises to adjoin to the light verb in the manner indicated by the arrow in (98) below:

(98)  
```
  vP
 /     \  
v     VP
 /     \  
  PRN   V'
 /     \
  you
  
V     PP
  go        to school
```

If (as Alison Henry argues) subjects remain in situ in imperatives in dialect A of Belfast English, the postverbal position of unaccusative subjects in sentences such as (95) can be accounted for straightforwardly. And the split projection analysis in (98) is consistent with the assumption that the merger operation by which phrases are formed is intrinsically binary.

However, there is one aspect of the analysis in (98) which at first sight might seem to be at variance with our earlier analysis of transitive clauses like those in (76), where we argued that in transitive VPs containing both a DP and a PP complement, the DP complement is merged in a position lower than the PP complement. Thus, in a transitive VP such as *send you to school*, the internal arguments will be merged in the manner shown in (99) below:

(99)  
```
  VP
 /     \
PP    V'
 /     \
  to school
  
  V
    
PRN   you
    
send
```

However (as noted in earlier discussion of (76) above), there is a theoretical reason why the direct object *you* must be merged as the complement of the verb in transitive VP like (99); this is because the object needs to be case-marked (and hence c-commanded) by V-*send*, and it will not be in the c-command domain of V if it is spec-VP. By contrast, in an intransitive VP like (98), the pronoun *you* is not case-marked by the verb *go* (because this is an unaccusative predicate which lacks the ability to assign accusative case), but rather is case-marked by a superordinate functional (Tense or perhaps Mood) head
which assigns it nominative case. What this suggests is that a nominal internal argument is merged in the
highest possible argument position within the projection containing it which is consistent with it being
within the domain of its case assigner – hence it can be in spec-VP as long as it is not case-marked by V.
Accordingly, the accusative argument you is merged as the complement of the transitive verb send in (99)
because it is assigned accusative case by send. (The object you is ultimately raised to the outer edge of VP,
and the verb send raises above it to adjoin to an affixal light verb, so deriving the surface word order send
you to school.) But nominative you in (98) is subsequently assigned case by a superordinate functional
head (not shown in 98), and so is merged ‘higher up’ in the specifier position within VP, closer to the
functional head which case-marks it. If a verb has only a single argument, this will be merged as the
complement of the verb because complement position is the ‘highest’ – and only – argument position
within such a VP. More generally, a (pro)nominal internal argument will be merged in spec-VP if VP is
intransitive and has a second internal argument, but will otherwise be merged as the complement of V.

Further evidence in support of the claim that unaccusative clauses have a split VP structure comes
from the fact that it enables us to provide a principled account of the observation that unaccusative
sentences like (100a) below have expletive counterparts like (100b):

(100)(a) A loud scream came from inside the house
(b) There came a loud scream from inside the house

If unaccusative clauses have a split VP structure, we can account for this alternation as follows. In (100a),
the unaccusative verb come is first-merged with its PP argument (forming the V-bar come from inside the
house), and second-merged with its indefinite QP argument (forming the VP a loud scream come from
inside the house) – the order of merger of the two arguments being the same as in (97) above. The
resulting VP is then merged with a null light-verb ø, forming the vP ø a loud scream come from inside the
house. The strong/affixal light-verb triggers raising of the verb come from V to v – in the manner shown
by the arrow below:

(101)                                           vP
                                             v
                            come+ø
VP
PP

The vP in (101) is then merged with a finite T constituent containing an abstract affix carrying an
interpretable past-tense feature, together with uninterpretable (unvalued) person and number features, and
an uninterpretable EPP feature. The T-affix agrees in person and number with, assigns nominative case to,
and triggers movement to spec-T of the DP a loud scream, so forming a TP which is merged with a null
declarative complementiser to form the structure shown in simplified form below:

(102) [CP [Ø [TP A [T Af] [CP [vP come+ø] [vP a loud scream [v come] from inside the house]]]]]

The past tense affix in T lowers onto the head v of vP in the PF component, with the result that the verb
COME is spelled out as the past tense form came in (100a) A loud scream came from inside the house.

Now consider the derivation of the unaccusative expletive sentence (100b) There came a loud scream
from inside the house. In §7.6, we proposed a number of conditions on the syntax of expletive pronouns in
English, including the following:

(103) **External Argument Condition**

An expletive can only be merged as the specifier of a verb which has no external argument

We rationalised (103) by supposing that expletives occupy the same structural position as external
arguments, with the result that the two are mutually exclusive. Given the arguments presented in this
chapter that external arguments occupy spec-v, a plausible extension of the same reasoning would be to
suppose that expletives likewise originate in spec-v. This being so, (100b) will be derived as follows.

The verb come is first merged with its PP argument (forming the V-bar come from inside the house),
and second-merged with its indefinite QP argument (forming the VP a loud scream come from inside the
The resulting VP is then merged with a null light-verb \( \phi \), forming the v-bar \( \phi \) a loud scream come from inside the house, and the resulting v-bar is in turn merged with expletive there to form the vP there \( \phi \) a loud scream come from inside the house. The strong/affixal light-verb triggers raising of the verb come from V to v – in the manner shown by the arrow below:

\[
\text{(104)} \quad \text{vP} \quad \text{PRN there} \quad \text{v} \quad \text{VP} \quad \text{come+\( \phi \)} \quad \text{QP a loud scream} \quad \text{V} \quad \text{PP} \quad \text{come from inside the house}
\]

The vP in (104) is then merged with a finite T constituent containing an abstract affix carrying an interpretable past-tense feature, together with uninterpretable (unvalued) person and number features, and an uninterpretable EPP feature. The T-affix agrees in person with (and triggers movement to spec-T of) expletive there, and agrees in person and number with (and assigns nominative case to) the QP a loud scream, so forming a TP which is merged with a null declarative complementiser to form the structure shown in simplified form below:

\[
\text{(105)} \quad [\text{CP} [\text{C } \phi] [\text{TP there } [\text{T Af } \text{there } [\text{V, come+\( \phi \)} [\text{VP a loud scream } [\text{V come from inside the house}]])]]
\]

The overall conclusion which our discussion in this section leads us to is thus that the split VP analysis allows us to provide a principled account of expletive and non-expletive unaccusative structures.

A further class of intransitive structures which can be argued to involve split VPs are passives like:

\[
\text{(106) The horse was jumped perfectly over the fence}
\]

The passive subject the horse originates as an internal argument of the verb jumped here. Since passive verb-forms are intransitive, the passive participle jumped cannot assign accusative case to the DP the horse; rather, the DP the horse is assigned nominative case by the T-auxiliary was. This means that the DP the horse must be merged in as high an argument position within VP as possible (and hence as close to the its case-assigner was as possible), and therefore will be merged in spec-VP. Accordingly, the derivation proceeds as follows.

The verb jump first merges with its PP argument over the fence to form the intermediate V-projection jump over the fence. This V-bar is then merged with the DP the horse, to form the larger V-projection the horse jump over the fence. The VP-adverb perfectly is adjoined to the resulting structure, so forming the VP perfectly the horse jump over the fence. The VP thereby formed is then merged with an intransitive light verb (with no external argument), and this attracts the verb jump to attach to it, so forming the vP below (with an arrow showing movement of the verb jump from V to v):

\[
\text{(107)} \quad \text{vP} \quad \text{v} \quad \text{VP} \quad \text{jump+\( \phi \)} \quad \text{ADV perfectly} \quad \text{DP the horse} \quad \text{VPP} \quad \text{jump over the fence}
\]

Since the vP in (107) is a passive structure, the light-verb is spelled out as the passive participle suffix -ed, with the result that the verb JUMP is ultimately spelled out in the PF component as the passive participle
form *jumped*. (Indeed, Chomsky 1999 labels the light-verb found in passive structures as PRT.)

The vP in (107) is subsequently merged with a past tense T constituent containing the passive auxiliary BE. This serves as a probe and locates the DP *the horse* as a goal which is active by virtue of its unvalued case feature. T agrees with, assigns nominative case to and attracts the DP *the horse* to move to spec-T. The resulting TP is merged with a null declarative complementiser, deriving the CP shown in simplified form below (with only overt constituents of vP being shown):

\[
(108) \quad [CP [c \emptyset] [TP \text{the horse} \left[ \text{was} \right] [vP \left[ v \right. \text{jumped} \left. \right]\right]\text{perfectly over the fence}]]
\]

Thus, the assumption that passive verb phrases have a split VP structure accounts for how the passive verb *jumped* comes to be positioned in front of the adverb *perfectly* even though the adverb *perfectly* modifies the expression *jumped over the fence*.

A further class of intransitive predicates for which a split VP analysis can be argued to be appropriate are raising predicates like *seem*. In this connection, consider the syntax of a raising sentence such as:

\[(109) \quad \text{You do seem to me to upset people}\]

This is derived as follows. The verb *upset* merges with its complement *people* (which is a QP headed by a null quantifier) to form the VP *upset people*. This in turn merges with a null causative light verb which has the pronoun *you* as its AGENT external argument. The light verb triggers raising of the verb *upset* from V to v, as shown by the dotted arrow below:

\[(110) \quad \text{vP} \quad \text{PRN} \quad \text{you} \quad \text{v} \quad [\text{vP} \quad [\text{v} \text{upset} + \emptyset] \quad \text{V} \quad \emptyset \text{people}]
\]

The vP in (110) is then merged with the infinitival T-constituent *to*. If we follow Chomsky (2001) in supposing that T in raising infinitives has an EPP feature and an unvalued person feature, the subject *you* will be attracted to move to spec-T in the manner shown below (the relevant structure being simplified by showing only overt constituents of v-bar):

\[(111) \quad \text{TP} \quad \text{PRN} \quad \text{you} \quad \text{T} \quad \text{to} \quad \text{DP} \quad \text{vP} \quad \text{v'} \quad \text{upset people}
\]

The TP in (111) is then merged as the complement of *seem*, forming the V-bar *seem you to upset people* (omitting null copies and other empty categories, to make exposition less abstract). The PP *to me* (which is an internal argument of *seem*) is subsequently merged as the specifier of the resulting V-bar, forming the VP shown in (112) below (once again simplified by not showing null copies and other empty categories):

\[(112) \quad \text{VP} \quad \text{PP} \quad \text{to me} \quad [\text{vP} \quad \text{V} \quad \text{v'} \quad \text{TP} \quad \text{seem you to upset people}]
\]

On the assumption that all verb phrases contain an outer vP shell, the VP in (112) will then merge with a null light verb which triggers raising of the verb *seem to attach to the light verb. Merging the resulting vP with a finite T constituent containing (emphatic) DO will derive the structure shown in simplified form
below (with the arrow showing movement of the verb *seem* from V to v):

(113) 

```
T'
  T
    vP
      DO
        v
          seem+ø
            PP
to me
        VP
          v'
            V
              TP
                seem
                  you
to upset people
```

The T-auxiliary DO serves as a probe looking for an active goal with an unvalued case feature. We can assume that the QP ø people and the pronoun me are unable to serve as goals for T because they are inactive at this point (their uninterpretable case features having already been valued as accusative and deleted). This being so, the pronoun you (which is active by virtue of having an unvalued case feature) will be the only constituent which can serve as the goal of DO in (113). Accordingly, the T-probe DO assigns nominative case to the pronoun you (and concomitantly agrees with you), and the EPP feature on T attracts you to move to spec-T, so deriving the structure shown in simplified form below:

(114) 

```
TP
  DP
    you
  T
    T'
      vP
        v
          seem
            PP
to me
          VP
            v'
              V
                TP
                  seem
                    you
                      to upset ø people
```

The resulting TP will then be merged with a null declarative complementiser, forming the CP structure associated with (109) *You do seem to me to upset people*. We can assume that the related sentence below:

(115) You do seem to upset people

has an essentially parallel derivation, except that the verb *seem* in (115) projects no prepositional argument, so that the structure formed when *seem* is merged with its TP complement will not be (112) above but rather the simpler structure [vP[v seem] [TP you [to upset ø people]]].

An interesting corollary of the light-verb analysis of raising verbs like *seem* is that the Italian counterpart of *seem* is used with the perfect auxiliary *essere* ‘be’ rather than *avere* ‘have’ – as we can illustrate in relation to:

(116) Maria mi è sempre sembrata essere simpatica

Maria me is always seemed be nice (= ‘Maria has always seemed to me to be nice’)

(The position of the EXPERIENCER argument mi ‘to me’ in (116) is accounted for by the fact that it is a clitic pronoun, and clitics attach to the left of a finite auxiliary/verb in Italian – in this case attaching to the left of è ‘is’.) In languages with the HAVE/BE contrast, HAVE typically selects a vP complement with an external argument, whereas BE selects a vP complement with no external argument. In this context, it is interesting to note (e.g. in relation to structures like (114) above) that the light-verb found in clauses containing a raising predicate like *seem* projects no external argument, and hence would be expected to occur with (the relevant counterpart of) the perfect auxiliary BE in a language with the HAVE/BE contrast. Data such as (116) are thus consistent with the light-verb analysis of raising predicates like *seem* outlined here. (It should be noted, however, that the HAVE/BE contrast is somewhat more complex than suggested here: see Sorace (2000) for a cross-linguistic perspective.)
We end this chapter with two brief technical footnotes. The first is that although we have argued here that verb phrases should be split into two separate projections, it should be noted that Bowers (2002) proposes to split transitive verb phrases into three projections, to include not just vP and VP but also a Transitivity Projection vP (though this projection is arguably a re-hash of the Object Agreement Projection found in earlier work described in Radford 1997 §§10.4-10.5, and proscribed in Chomsky 1995). The second point to note is that throughout our discussion of split VPs, we tacitly assumed that V-to-v raising is a syntactic operation which takes place in the syntax. However, if we follow Chomsky (1999, 2001) in taking head-to-head movement to be a PF operation, it follows that lexical verbs will remain in situ (in the head V position of VP) in the syntax, and only raise to adjoin to the light-verb v in the PF component (movement being driven by the morphological requirement for the affixal light-verb to have a verbal host).

8.10 Summary

We began this chapter in §8.2 by outlining the claim made by Rizzi that in clauses which contain preposed focus/topic expressions, CP splits into a number of separate projections, viz. a Force Phrase/ForceP, a Topic Phrase/TopP and a Focus Phrase/FocP (with the Focus head being strong and so triggering movement of an auxiliary from T to Foc, but the Topic and Force heads being weak). We posited that preposed topics move to the specifier position in TopP, preposed negative expressions move to the specifier position in the Focus Phrase (as do preposed wh- expressions in main-clause questions), and wh-expressions in other types of structure move to the specifier of the Force Phrase. In §8.3 we went on to examine Rizzi’s hypothesis that split CP structures also contain a Finiteness Phrase/FinP, with Fin being the locus of infinitival for. We argued, however, that in structures other than for-infinitives in English, Fin is generally syncretised with the head immediately above it, and hence not projected as an independent head. In §§8.4-8.5, we looked at suggestions for splitting TP into distinct Tense, Aspect and Mood projections. In §8.4, we looked at claims by Felser and Suñer that in verb-particle structures such as He took the rubbish out and in quotative structures such as ‘Right’ said Fred, the verb took/said raises to an Aspect position above V but below T, but concluded that the case for positing an Aspect head in English was not entirely convincing. In §8.5 we looked at proposals in Schütze (2004) to split the former INFIL constituent up into separate T/Tense and M/Mood projections, with M being the locus of modals and mood morphemes, and T being the locus of tense affixes: we noted (but questioned) Schütze’s argument that this would eliminate Affix Lowering. In §8.6 we outlined work by Chomsky, Larson, Hale and Keyser suggesting that VPs can be split into two distinct projections – an inner VP core headed by a lexical verb and an outer vP shell headed by an affixal light-verb. In particular, we looked at the syntax of ergative verbs like roll which are used both intransitively in structures like The ball rolled down the hill and transitively in structures like They rolled the ball down the hill. We argued that the verb phrase in the transitive structures comprises an inner VP headed by a lexical verb/V core contained within an outer vP shell headed by a causative light-verb/v with an AGENT subject: V agrees with, assigns accusative case to and triggers movement to spec-VP of the DP the ball; and the affixal light-verb attracts the verb roll to raise from V to v. We argued that data relating to the distribution of various types of adverb lend support to the shell analysis. In §8.7 we extended the shell analysis to a variety of other double-complement transitive structures including prepositional structures such as load the cart with hay, resultatives like turn the litmus-paper red, and verb-particle structures like pour the whisky slowly out. We also outlined Chomsky’s vP shell analysis of simple transitive structures like John read the book, noting that an accusative internal argument only raises to the edge of VP when it is not already the highest non-head constituent of VP. We also showed how the shell analysis could be extended to unergatives if these are analysed as transitive predicates which undergo object-incorporation. In §8.8 we outlined a shell analysis of ECM structures like I believe him sincerely to be telling the truth, arguing that in such structures the complement clause subject him raises to become the specifier of the ECM verb believe, and hence ends up positioned in front of the adverb sincerely which modifies the verb believe. We contrasted ECM structures with OC/Object Control structures like She advised him to complain to the authorities. In §8.9 we argued in favour of a shell analysis for intransitive clauses. We began by showing how a split VP analysis of unaccusative clauses would account for the word-order found in Belfast English imperatives such as Go you to school! and in standard English unaccusative expletive structures such There came a loud scream from inside the house. We then went on to extend the shell analysis to passives like The horse was jumped.
perfectly over the fence, and to raising structures such as They seem to me to be fine. We concluded that all transitive and intransitive verb phrases alike have a shell structure in which the verb raises from V to v, with AGENT and EXPERIENCER subjects (and expletive subjects) originating in spec-vP, and all other arguments originating within VP.

WORKBOOK SECTION

Exercise 8.1
Discuss how the structure of the bracketed clauses in the sentences below would be analysed within the framework of the split CP analysis outlined in §§8.2-8.3 of the main text.

1. He admitted [that they will only rarely enjoy this course]
2. He admitted [that only rarely will they enjoy this course]
3. *He admitted [that only rarely they will enjoy this course]
4. He admitted [that this course, they will only rarely enjoy]
5. *He admitted [that this course will they only rarely enjoy]
6. He admitted [that this course, only rarely will they enjoy]
7. *He admitted [that this course will only rarely they enjoy]
8. *He admitted [that only rarely will this course, they enjoy]
9. *He admitted [only rarely, this course, they will enjoy]
10. This is a course [which only rarely will they enjoy]

Then comment on how the wh-clauses in the following sentences might be analysed within the split CP framework (14 and 15 being from the Leonard corpus on the CHILDES data-base, MacWhinney 1995):

11. What a mine of useless information that I am! (produced by an Irish TV celebrity)
12. I wonder which dress that they picked (Belfast English, from Henry 1995, p.107)
13. He protested that how could he have known she would be killed? (= semi-indirect speech)
14. What Kent’s gonna play with? (produced by a 5-year-old child with Specific Language Impairment)
15. What’s he gon(na) kill? (produced by the same child as 14)

Finally, say how you think the following sentences could be derived under the split TP analysis outlined in §8.4 of the main text, highlighting any problems which arise.

16. He should receive a pardon
17. Should be not receive a pardon?
18. Did he receive a pardon?
19. Didn’t she demand that he receive a pardon?
20. She demanded that he not receive a pardon

Helpful hints
To simplify your discussion of sentences 1-10, concern yourself only with the structure of the left periphery of the bracketed clauses in these examples (i.e. the Force/Topic/Focus Phrase projections above the TP layer), and assume that a null Fin head is syncretised with the head immediately above it. Assume that the TP has the skeletal structure [\(TP\ it [\(T\ will\) only rarely enjoy this course] but don’t concern yourself with its precise internal structure. Assume that the complementiser that occupies the head Force position of a ForceP projection (marking the relevant clause as declarative in force); that only rarely is an ADVP constituent (whose internal structure need not concern you) which moves to the edge of a FocP projection when preposed: and that the DP this course moves to the edge of a TopP projection when preposed. Assume that a clause only contains a FocP projection if it contains a focussed constituent preceding the subject, and only contains a TopP constituent if it contains a topic constituent preceding the subject.

In sentences 11-15, likewise concern yourself only with the structure of the left periphery of the wh-clauses. Bear in mind the claim made in the main text that focused wh-interrogative expressions can either move to become the specifier of a strong Focus head (in main-clause questions) or of a weak Force head (in embedded questions), but that exclamative wh-expressions move to the specifier position within the
Force Phrase in main-clause questions and embedded questions alike. In relation to 14-15, bear in mind the possibility that some language learners may be confused about the precise landing site of preposed interrogative wh-expressions in particular types of clause.

To simplify your discussion of sentences 16-20, assume that the clauses they contain are of the form CP+MP+TP(+NEGP)+VP but do not concern yourself with the internal structure of VP. Make the following set of assumptions (based on Schütze 2004):

(i) M contains either a modal stem or an abstract (indicative/subjunctive) mood morpheme
(ii) An indicative mood morpheme is spelled out as a DO-form when not attached to a verbal stem
(iii) T contains either a strong affix which triggers raising of V to T, or a weak affix which raises to M
(iv) Neg is non-affixal and cannot attract V to raise to Neg; however clitic n’t raises to attach to M.
(v) auxiliary inversion is movement from M to C.

Model answer for 1

Rizzi posits that CP splits into multiple projections in clauses which contain a preposed topic or focus constituent. Although only rarely seems to function as a preposed focused expression and this course as a preposed topic in the relevant examples above, neither the main admitted clause nor the complement enjoy clause contains a preposed topic or focus constituent in 1; hence, neither contains a FocP or TopP projection. Since the finiteness head here is null (e.g. it does not contain infinitival for), it will be conflated with the Force head immediately above it, so forming a syncretised Force-Finiteness head which is traditionally labelled as C. Accordingly, both clauses in 1 will be CPs, the main clause headed by a null complementiser, and the complement clause headed by that. However, since our concern here is with the structure of the bracketed that-clause which serves as the complement of the verb admitted, we concentrate on how this is derived.

Assume (as in the helpful hints) that we have reached a stage of derivation where we have formed the TP the students will only rarely enjoy this course. Because there is no intervening topic or focus projection, the relevant force and finiteness features are here syncretised onto a single C/complementiser head (which is therefore marked as being both declarative and finite), so forming the structure shown in highly simplified form in (i) below:

(i) [CP [C that_{DEC,FIN} [TP ø students [T will] only rarely enjoy syntax]]]

The complementiser introducing the clause in (i) can be spelled out either as that by virtue of carrying a declarative-force feature (in accordance with (30i) in the main text), or can be given a null spellout as ø by virtue of carrying a finiteness feature (in accordance with (30ii) in the main text). We therefore correctly predict that alongside sentence 1, we can also have a sentence like (ii) below, in which the bracketed complement clause contains a null complementiser:

(ii) He admitted [ø students will only rarely enjoy syntax]

Model answer for 16

Given the assumptions made in the helpful hints (adapted from Schütze 2004), sentence 11 will have the structure shown below (simplified inter alia by not showing the subject he originating within VP, and by not splitting VP into two separate vP/VP projections):

(i) [CP [C ø] [MP he [M shall] [TP [T Af_{PAST} [VP [V receive] a pardon]]]]]

By hypothesis, the past tense affix in T can be either weak or strong. If it is weak, it will raise to attach to the modal stem shall in M, so deriving the structure:

(ii) [CP [C ø] [MP he [M shall+Af_{PAST} [TP [T Af_{PAST} [VP [V receive] a pardon]]]]]

The PF component will then spell out the string shall+Af_{PAST} as the past tense form should. However, if (as Schütze assumes) T can also contain a strong affix, the strong affix in T will trigger raising of the verb receive from V to T, so deriving:

(iii) [CP [C ø] [MP he [M shall] [TP [T receive+Af_{PAST} [VP [V receive] a pardon]]]]]

However, this will leave the modal stem shall in M without a tense affix, and since the PF component has no means of spelling out untensed modals, the resulting derivation will crash. What this illustrates is that
the split TP analysis developed by Schütze over-generates in certain respects, and hence could be argued not to meet Chomsky’s (2006, p.2) criterion of ‘efficient computation’. In this instance, one way of circumventing the overgeneration problem would be to suppose that it is a lexical property of modals that they select a TP complement headed by a weak T constituent (though we can’t use the mechanism of selection to resolve all the over-generation problems posed by Schütze’s analysis).

Exercise 8.2
Discuss how the syntax of the following sentences could be analysed within the split VP framework, giving arguments in support of your analysis.

1. They will increase the price gradually to 90 dollars
2. He will explain the procedures
3. We must examine it carefully
4. You should show the letter privately to her
5. You must go immediately to the police
6. There may suddenly appear a ghost at the window
7. It was put hastily in the bag
8. It has slowed the traffic considerably down
9. The police are reported by the press to have arrested a suspect yesterday
10. Several politicians are widely thought to be suspected of corruption
11. There does seem clearly to me to remain some unrest in Utopia
12. Some evidence would certainly appear to have emerged recently of corruption
13. He may suspect you strongly to have lied to the jury
14. I do believe there sincerely to be some disaffection
15. He expects it to emerge explicitly from the report that bribes were paid
16. They asked him politely to leave the room

Comment in particular on the syntax of the italicised constituents, saying what position each one occupies, what case (if any) it receives and how.

Helpful hints
Make the following general assumptions about the syntax of transitive and intransitive verb phrases. All verb phrases have a split structure comprising a projection of a lexical verb \( V \) contained within a projection of a light verb \( v \). AGENT and EXPERIENCER subjects (and expletive subjects) are merged with the light verb (as its specifier), and all other arguments are merged with the lexical verb \( V \) (nominal arguments being merged in the highest possible argument position which is within the domain of their case assigner). A transitive \( V \) agrees with and assigns accusative case to a phi-complete nominal which it c-commands, and triggers movement of the closest nominal with which it agrees in person to the outer edge of the VP in question (provided that the targeted nominal is not already the highest non-head constituent of the relevant VP). Treat by-phrases in the relevant examples above as AGENT internal arguments of the associated lexical verbs. In relation to 12, bear in mind the treatment of discontinuous constituents in earlier chapters.

Model answer for 1
The verb *increase* can be used not only as a transitive verb in sentences such as 1 above, but also as an intransitive verb in sentences such as:

(i) The price will increase gradually to 90 dollars

Accordingly, we can take *increase* to be an ergative predicate which (in intransitive uses) has the same syntax as an unaccusative verb. This means that 1 is derived as follows. The verb *increase* first-merges with its THEME DP argument *the price* to form the V-bar *increase the price*, and second-merges with its GOAL PP argument *to 90 dollars* to form the larger V-projection *to 90 dollars increase the price*. This VP-adverb *gradually* is adjoined to the resulting structure, forming the VP shown below:
The VP in (ii) subsequently merges with a causative light-verb ϕ with an external AGENT argument (= they), so forming the structure (iii) below:

The transitive V increase agrees with and assigns accusative case to the DP the price which it c-commands. Because this DP is not the highest non-head constituent within VP, it also triggers raising of the DP the price to the outer edge of VP. The affixal light-verb triggers movement of the verb increase from V to v, so deriving:

The vP in (iv) is subsequently merged with a T constituent containing will, and this agrees (invisibly) with and assigns nominative case to the subject they. T has an EPP feature which triggers raising of the subject they to spec-TP. Merging the resulting TP with a null declarative C forms the CP shown in simplified form below:

(v) [CP [C [ϕ [TP [they [T will] [vp [they [, ϕ+increase] [vp the price gradually to 90 dollars [v increase] the price]]]]]]]
9.

Phases

9.1 Overview
In this chapter, we look at recent work by Chomsky suggesting that syntactic structure is built up in phases (with phases including CP and transitive vP). At the end of each phase, part of the syntactic structure already formed undergoes transfer to the phonological and semantic components, with the result that the relevant part of the structure is inaccessible to further syntactic operations from that point on. (An incidental point to note is that we shall simplify exposition – and follow Chomsky – by adopting a split projection analysis of verb phrases, but not of TP or CP constituents.)

9.2 Phases
In §7.5, we noted Chomsky’s claim that all syntactic operations involve a relation between a probe P and a local goal G which is sufficiently ‘close’ to the probe (or, in the case of multiple agreement, a relation between a probe and more than one local goal). However, an important question to ask is why probe-goal relations must be local. In this connection, Chomsky (2001, p.13) remarks that ‘the P, G relation must be local’ in order ‘to minimise search’ (i.e. in order to ensure that a minimal amount of searching will enable a probe to find an appropriate goal). His claim that locality is forced by the need ‘to minimise search’ suggests a processing explanation: the implication is that the Language Faculty can only process limited amounts of structure at one time – and, more specifically, can only hold a limited amount of structure in its ‘active memory’ (Chomsky 1999, p.9). In order to ensure a ‘reduction of computational burden’ (1999, p.9) Chomsky proposes that ‘the derivation of EXP[ressions] proceeds by phase’ (ibid.), so that syntactic structures are built up one phase at a time. He maintains (2001, p.14) that ‘phases should be as small as possible, to minimise memory’. More specifically, he suggests (1999, p.9) that phases are ‘propositional’ in nature, and and include CP and transitive vP (i.e. a vP with an AGENT or EXPERIENCER external argument, which he denotes as v*P). His rationale for taking CP and v*P as phases is that CP represents a complete clausal complex (including a specification of force), and v*P represents a complete thematic (argument structure) complex (including an external argument).

Once all the operations which apply within a given phase have been completed, the domain of the phase (i.e. the complement of its head) becomes impenetrable to further syntactic operations. Chomsky refers to this condition as the Phase Impenetrability Condition/PIC – and we can state it informally as follows (cf. Chomsky 2001, p.5, ex. 6)

(1) **Phase Impenetrability Condition/PIC**
The c-command domain of a phase head is impenetrable to an external probe (i.e. A goal which is c-commanded by the head of a phase is impenetrable to any probe c-commanding the phase)

The reason why the domain of the phase head is impenetrable to an external probe (according to Chomsky 2001, p.5) is that once a complete phase has been formed, the domain of the phase undergoes a transfer operation by which the relevant (domain) structure is simultaneously sent to the phonological component to be assigned an appropriate phonetic representation, and to the semantic component to be assigned an appropriate semantic representation – and from that point on, the relevant domain is no longer accessible to the syntax. So, for example, once a complete CP phase has been formed, the TP which is the domain (i.e. complement) of the phase head C will be sent to the phonological and semantic components for processing. As a result, TP is no longer visible in the syntax, and hence neither TP itself nor any constituent of TP can subsequently serve as a goal for a higher probe of any kind: i.e. no probe c-commanding CP can enter into a relation with TP or any constituent of TP.

In order to make our discussion more concrete, consider the derivation of the following sentence:

(2) **Will Ruritania withdraw troops from Utopia?**

Given the split projection (vP+VP) analysis of verb phrases outlined in the previous chapter, (2) will be derived as follows. The verb withdraw merges with a QP complement (comprising a null partitive
quantifier ø and the noun *troups*) and a PP specifier (comprising the preposition *from* and a definite DP containing a null determiner and the noun *Utopia*) to form the VP *from ø Utopia withdraw ø troops*. The verb *withdraw* agrees with and assigns accusative case to the QP object *ø troops* which it c-commands, and attracts it to move to the outer edge of VP. The resulting VP is merged with a causative light verb whose external AGENT argument is *ø Ruritania* (another definite DP headed by a null determiner). Since the light-verb is affixal, it triggers movement of the verb *withdraw* from its original (italicised) position in V to v, so resulting in the structure shown below (with arrows marking movement):

```
(3)                                    vP
  DP                                               v
  ø Ruritania
  v
  withdraw+ø
  VP
  QP                                            V
  ø troups  
  PP                                      V
  from Utopia
  V                    QP
  withdraw
  ø troups
```

Since a transitive vP (i.e. a vP with an external argument) is a phase, and since the vP in (3) is transitive and has the external argument *ø Ruritania*, the VP constituent (by virtue of being the domain/complement of the light-verb which is the head of the phase) will undergo transfer to the phonological and semantic components at this point, and thereafter cease to be accessible to further syntactic operations. Let’s suppose that Transfer results in trace copies of moved constituents receiving a null spellout in the PF component, and that uninterpretable features which have been deleted are removed from the structure handed over to the semantic component, but not from the structure handed over to the phonological component. Consequently, the phonological component will not spell out the original (italicised) copies of the verb *withdraw* and the QP *ø troups* within the VP in (3), and only the items *troops* and *from Utopia* will be given an overt phonetic spellout.

The syntactic computation then proceeds once more, with [₁ *will*] being merged with the vP in (3) to form the T-bar shown below (simplified by showing only those items withing VP which received an overt spellout in the PF component after the VP underwent transfer at the end of the vP phase, and using outline font to indicate that the items in question have already undergone transfer):

```
(4)                           T
  T                                           vP
  will
  DP                                          v
  ø Ruritania
  v
  withdraw+ø
  VP
  troops from Utopia
```

Since [₁ *will*] has uninterpretable (and unvalued) person/number features, it is an active probe which searches for a local goal to value and delete its unvalued features. Neither the QP *ø troups* nor the DP *ø Utopia* are accessible to the probe *will* (since both are contained within a VP which has already been transferred to the phonological and semantic components); however, the DP *ø Ruritania* is accessible to *will* and is syntactically active by virtue of its uninterpretable case feature. Hence, *will* agrees (invisibly) with and assigns (invisible) nominative case to the DP *ø Ruritania*. The auxiliary [₁ *will*] also has an EPP feature requiring movement of the closest goal which it agrees with to spec-T; accordingly, the DP *ø Ruritania* is moved from its original (italicised) position in spec-v to become the specifier of *will*, as shown by the arrow below:
The resulting TP is merged with a null interrogative C. Let’s suppose that (as was argued in chapter 5) yes-no questions contain a null yes-no-question operator merged in spec-C (perhaps a null counterpart of the adverb whether), and that C has a tense feature which attracts will to move from its original (italicised) position in T to adjoin to the null C heading CP in the manner shown by the arrow below:

\[
\begin{array}{cc}
(5) & \text{TP} \\
 & \text{DP} \\
 & \phi \text{Ruritania} \\
 & \text{TP} \\
 & \text{T'} \\
 & \text{T} \\
 & \text{will} \\
 & \text{DP} \\
 & \phi \text{Ruritania} \\
 & \text{vP} \\
 & \text{v'} \\
 & \text{VP} \\
 & \text{troops from Utopia} \\
\end{array}
\]

Since CP is a phase and the domain of the head of a phase is spelled out at the end of a phase, TP undergoes transfer to the phonological and semantic components at this point. The transfer operation results in the italicised copies of the auxiliary will and the DP $\phi$ Ruritania receiving a null spellout in the phonological component.

However, we are now left with something of a problem. We have come to the end of the derivation, but so far neither C nor the null yes-no question operator which serves as its specifier have been ‘handed over’ to the phonological and semantic components for further processing. One way of ensuring that this happens is to make the additional assumption in (7ii) below about transfer:

\[
\begin{array}{cc}
(7) & \text{Transfer} \\
(i) & \text{At the end of each phase, the domain (i.e. complement of the phase head) undergoes transfer} \\
(ii) & \text{At the end of the overall derivation, all remaining constituents undergo transfer} \\
\end{array}
\]

In the case of (6), the two remaining constituents which have not yet undergone transfer are the C-constituent containing will and the null yes-no question operator in spec-CP. Accordingly, these undergo transfer to the phonological/semantic components at the end of the overall derivation. (We shall comment further on (7ii) below, however.)
9.3 Intransitive and defective clauses

Our illustrative account of phases in the previous section involved a structure containing a transitive vP phase and a CP phase. However, since neither intransitive clauses (i.e. those containing a vP with no external argument) nor defective clauses (i.e. clauses which are TPs lacking a CP projection) are phases, things work differently in such structures – as we can illustrate in relation to the derivation of:

(8) There are thought by many to remain some problems in Utopia

The unaccusative verb *remain* merges with its LOCATIVE complement in Ø Utopia (*Utopia* being a DP headed by a null determiner) to form the V-bar *remain in Ø Utopia*, and this V-bar is in turn merged with its THEME argument (the quantifier phrase *some problems*) to form the VP *some problems remain in Ø Utopia*. This VP in turn is merged with a null light-verb which, being affixal, triggers movement of the verb *remain* from its italicised position in V to adjoin to the light verb. If (as suggested in the previous chapter), expletives originate in spec-v, at the end of the v-cycle we will have the following structure:

![Diagram](image)

Although a transitive vP is a phase (and so requires its domain to be spelled out at the end of the v-cycle), the vP in (9) is not a phase because it is *intransitive* by virtue of having no thematic external argument (i.e. no AGENT or EXPERIENCER subject) – as can be seen from the fact that the spec-v position in (9) is occupied by the non-thematic expletive pronoun *there*. Accordingly, the VP complement does not undergo transfer at this point, and the syntactic derivation proceeds by merging the resulting vP with infinitival to.

If (as Chomsky 2001, fn.56 argues) infinitival to has an EPP feature and a person feature in defective clauses, to will attract expletive *there* (which is a third person pronoun) to move to spec-T, so deriving:

![Diagram](image)

The (passive participle) verb *thought* is then introduced into the derivation, and merges with the TP in (10) to form a V-bar which in turn merges with the PP *by many* to form the VP shown below:
The resulting VP is then merged as the complement of a light verb which (being affixal) attracts the verb THINK to adjoin to it. If we suppose that the light verb is participial in nature (which is why Chomsky 1999 uses the label PRT to denote it), we can account for why the verb think is ultimately spelled out as the passive participle thought. Merging the resulting vP with the passive auxiliary BE will derive the following T-bar constituent (where the verb THINK is shown in its passive participle spellout form thought):

(12) 

```
  T'  
  |   
  T   
  |   
  BE  
  |   
  vP  
  |   
  v   
  |   
  VP  
  |   
  thought+Ø  
  |   
  PP  
  |   
  by many  
  |   
  V   
  |   
  TP  
  |   
  PRN  
  |   
  there  
  |   
  T'  
  |   
  T   
  |   
  to  
  |   
  PRN  
  |   
  there  
  |   
  vP  
  |   
  v'  
  |   
  v   
  |   
  remain+Ø  
  |   
  QP  
  |   
  some  
  |   
  problems  
  |   
  V  
  |   
  remain  
  |   
  in Ø Utopia  
  |   
  PP  
  |   
  V   
  |   
  in Ø Utopia  
  |   
  V'  
  |   
  VP  
  |   
  thought+Ø  
  |   
  PP  
  |   
  by many  
  |   
  V  
  |   
  TP  
  |   
  PRN  
  |   
  there  
  |   
  T'  
  |   
  T   
  |   
  to  
  |   
  PRN  
  |   
  there  
  |   
  vP  
  |   
  v'  
  |   
  v   
  |   
  remain+Ø  
  |   
  QP  
  |   
  some  
  |   
  problems  
  |   
  V  
  |   
  remain  
  |   
  in Ø Utopia  
  |   
  V'  
  |   
  VP  
```

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At this point, BE is an active probe by virtue of its uninterpretable (and unvalued) φ-features, and so it searches for an active local goal to value its person/number features. In chapter 7, we suggested that a head carrying unvalued person and number features keeps on probing until it locates the closest active φ-complete goal which can value (and delete) its person and number features. Accordingly, BE will not stop probing when it locates the expletive pronoun there (active by virtue of its uninterpretable person feature, but φ-incomplete by virtue lacking number) and will continue to probe deeper into the structure until it locates the φ-complete third person plural goal some problems (active by virtue of its uninterpretable and unvalued case feature and φ-complete by virtue of carrying both person and number). Both there and some problems are accessible goals for BE since neither is contained within a structure which has undergone transfer. (We can assume that the pronoun many is not active at this point, because it falls within the domain of a closer probe by which will already have valued its case feature as accusative and deleted it.) Accordingly, BE simultaneously agrees in person with there and some problems, and in number with some problems, so that BE is assigned the feature values [third-person, plural-number]. Since some problems is φ-complete, it can delete the uninterpretable person and number features of BE. Conversely, BE (by virtue of being finite) can value the unvalued case-feature of some problems as nominative, and (because BE is also φ-complete) can delete the relevant case-feature (and also the person feature of there). The EPP feature of T is deleted by moving the closest active goal (i.e. there) from its original position as the specifier of to into its derived position as the specifier of BE (movement being indicated by an arrow below). Merging the resulting TP with a null declarative complementiser derives the CP structure shown in simplified form below:

\[
\begin{array}{c}
\text{(13) CP} \\
\text{C} \\
\text{TP} \\
\phi \\
\text{PRN} \\
\text{there} \\
T' \\
\text{T} \\
\text{vP} \\
\text{VP} \\
\text{v} \\
\text{thought+Ø} \\
\text{PP} \\
\text{by many} \\
\text{V'} \\
\text{Tp} \\
\text{thought} \\
\text{T} \\
\text{to} \\
\text{PRN} \\
\text{there} \\
\text{T'} \\
\text{vP} \\
\text{v} \\
\text{remain+Ø} \\
\text{QP} \\
\text{some problems} \\
\text{V} \\
\text{in Ø Utopia} \\
\end{array}
\]

Since CP is a phase, the TP headed by [T BE] which constitutes its domain will undergo transfer at this point, in accordance with (7i). The italicised copies of moved constituents will be given a null spellout, and the auxiliary BE in T will be spelled out as are in the phonological component (since it has been
valued as third person plural in the course of the derivation). The null C heading CP subsequently undergoes transfer by (7ii), and is assigned a null spellout in the phonological component, and interpreted in the semantic component as marking the relevant sentence as declarative in force.

In the context of our discussion of phases here, the key point which emerges is that neither an intransitive vP nor a defective TP clause constitutes a phase – e.g. in the case of (13), not the intransitive vP containing *remain*, nor the vP containing the passive participle *thought*, nor the defective TP complement of *thought*. In consequence, the relevant vP and TP constituents are still accessible in the syntax when *be* is introduced into the derivation, so allowing *be* to agree with *some problems.

9.4 Phases and A-bar movement

The phase-based theory of syntax outlined in the previous section has far-reaching consequences for the operation of A-bar movement operations like wh-movement – as we can illustrate in relation to the following sentence:

(14) Where is it thought that he will go?

The derivation of (15) proceeds as follows. The unaccusative verb *go* is merged with its GOAL argument (the locative adverbial pronoun *where*) to form the V-bar *go where*, which in turn is merged with its THEME argument *he* to form the VP *he go where*. This VP is then merged with a null affixal light-verb which triggers raising of the verb *go* to v from its original position in V, as shown by the arrow below:

(15)```
         vP
        /    \
       v     VP
      /\     /
     PRN   V'
    /   \    /
   he    go     PRN
  /     \      /
 V      where
```

Since vP is intransitive (by virtue of the fact that the light-verb has no external argument), vP is not a phase, and Transfer cannot apply at this point. The syntactic computation therefore continues, with [*T will] merging with the vP in (15). *Will* agrees with (and assigns nominative case to) *he*, and the EPP feature of *will* triggers raising of *he* from its original position in spec-V to spec-T (as shown by the arrow below). Merging the complementiser *that* with the resulting TP forms the CP shown in (16) below:

(16)```
        CP
       /    \
      C     TP
     /\     /
    PRN   T'
   /   \  /    /\     /
  he   f   will v     V'
 /     \      /
 V      PRN   go     PRN
     /     \      /
    go     where
```

Since CP is a phase, its domain (i.e. its TP complement) will undergo transfer at this point. This means that neither TP nor any of the constituents of TP will subsequently be accessible to further syntactic operations – i.e. in effect, TP and its constituents of TP are *frozen* in place once TP undergoes transfer.
However, this causes an obvious problem, since if all constituents of TP are frozen in place at this point, the wh-word where will be unable to move from the (sentence-final) V-complement position it occupies in (16) to the (sentence-initial) main clause C-specifier position which it occupies in (14) Where is it thought that he will go? As we saw in §5.6, one way to overcome this problem is to posit that wh-movement applies in a successive-cyclic fashion (one clause at a time), and that the complementiser that in structures like (16) has an edge feature which triggers movement of the closest wh-expression (= where) to become the specifier of the complement-clause CP headed by that before where subsequently moves on to become the specifier of the main clause C constituent containing the inverted auxiliary is. If this is so, where will move from the clause-final position which it occupies in (16) above as the complement of go into the clause-initial position which it occupies in (17) below as the specifier of that (movement being indicated by an arrow):

(17)                    CP
PRN                           C
where                       C'
PRN                           TP
that

At this point (once all the operations which apply on the C-cycle have applied) the domain of C (i.e. its TP complement) will undergo transfer in accordance with (7i), because CP is a phase: one consequence of this is that the italicised copies of moved constituents will be marked as receiving a null spellout in the phonological component.

After transfer of TP is completed, the syntactic computation continues. The CP in (17) is merged as the complement of the verb THINK, and the resulting VP is in turn merged as the complement of a participial light-verb (ensuring that THINK is eventually spelled out as the passive participle thought), with the verb THINK (below shown as thought) raising to adjoin to the light verb. The expletive pronoun it is merged as the specifier of the vP. A present-tense T-constituent containing the passive auxiliary BE is then merged with the vP already formed, and [T BE] agrees with the third person singular expletive pronoun it (so that BE is eventually spelled out as is), and the EPP feature on [T BE] attracts it to raise to spec-T. Merging the resulting TP with a null affixal interrogative C will trigger raising of BE from its original (italicised) position in T to C; since the interrogative C also has an edge feature, it will attract interrogative where to move from the italicised spec-C position in the complement clause into spec-C position in the main clause, so deriving the CP shown in simplified form below (with movements triggered by the main-clause C constituent being arrowed):
Since CP is a phase, its domain (= the main clause TP) will undergo transfer by (7i) at this point, so that the italicised traces of *is, thought* and *where* will receive a null spellout in the phonological component. If we assume an additional transfer condition (7ii) to the effect that ‘At the end of the overall derivation, all remaining constituents undergo transfer’, the remaining constituents *where* and *is+ø* on the edge of the root CP undergo transfer by (7ii).

However, suppose that we dispense with the additional condition (7ii) and posit that the only transfer condition which UG permits is (7i). It would then follow that any constituents on the edge of a root CP would never be spelled out, and would always be ‘silent’ – so seemingly leaving us with no way of deriving a sentence like (14). But suppose we follow Rizzi (1997) in splitting CP into a number of distinct projections (including Force and Focus projections). Suppose also that a focussed interrogative constituent can either move to the specifier position in a Force Phrase (by virtue of being interrogative in Force) or to the specifier position in a Focus Phrase (by virtue of being focused). If a focussed interrogative constituent like *where* in a main-clause question like (14) moves to the specifier position in the Force Phrase (and the Force and Finiteness heads are syncretised as a unitary C constituent), we will end up with a structure like (18), and if only the domain/complement of a phase head undergoes transfer (via condition 7i), the wh-word *where* and the inverted auxiliary *is* will be unable to be spelled out.

But now consider what happens if both the wh-word and the auxiliary move to the edge of a Focus Projection beneath the Force head, as shown in simplified form below:

(19) \[\text{[ForceP [Force ø] [FocP where [\text{\textit{Foc} is} it \text{thought that he will go}]]]}\]

If Force is a phase head, the italicised constituents in its FocP domain will be spelled out at this point, including *where* and *is*. It also follows that a Force head in a root/main clause can never be overt (and this explains e.g. why declarative main clauses are not introduced by *that*). More generally, the split CP analysis taken in conjunction with the assumption that C/Force is a phase head helps us account for why preposed interrogative phrases end up in spec-FocP and not in spec-ForceP in main-clause questions. (It should be noted, however, that the above account of spellout in main clauses is incompatible with the assumption made in §8.2 that exclamative wh-expressions always move to spec-ForceP, even in main clauses: hence, we shall keep to the account of spellout given in (7) above in what follows.)

What our overall discussion in this section tells us is that just as A-movement applies in a successive-cyclic fashion (so that each time a new T constituent is introduced into the derivation, it can attract the closest nominal goal to become its specifier), so too (within a phase-based theory of syntax) A-bar movement operations like wh-movement must apply in a successive-phasal fashion (one phase at a time):
this means that each time a new phase head like C is introduced into a wh-structure, it will serve as a probe which attracts the closest wh-goal to move into its specifier position.

### 9.5 A-bar movement in transitive clauses

In the previous section, we looked at how wh-movement applies in intransitive clauses within Chomsky’s phase-based theory of syntax. However, the picture is more complicated in the case of A-bar movement out of a transitive vP. Since transitive vPs are phases, it follows that in structures containing one or more transitive vPs, wh-movement will have to pass through intermediate spec-v positions as well. We can illustrate how this works by looking at the derivation of the transitive sentence What have they done? This will be derived as follows. The verb do (shown below in its spellout form done) merges with its thematic complement what to form the VP done what; it also agrees with and assigns accusative case to what (but does not attract what to the edge of VP because what is already the highest non-head constituent within VP). The resulting VP is merged with a transitive light verb whose external argument is they and which (by virtue of being affixal) triggers raising of done from V to v. Let’s suppose that just as C can have an edge feature attracting movement of a wh-expression, so too a transitive light-verb (by virtue of being a phase head, like C) can likewise have a wh-attracting edge feature. This being so, what will be moved to become a second (outer) specifier for vP, forming the structure below:

(20)                           vP
     PRN                            v
     PRN what                       v'
     PRN they                       v'
     v                               VP
                  done+ø
V                  PRN
                  done what

The multiple-specifier analysis in (20) is in accordance with Chomsky’s (1998, p.16) assumption that a head can have multiple specifiers – in the case of (20), an inner specifier they representing the external argument of the light verb, and an outer specifier what which is attracted by the edge feature of the light verb. In accordance with (7i), the VP in (20) will undergo transfer at the end of the vP phase, and the two italicised copies of moved constituents will thereby be given a null spellout.

Since a transitive vP is a phase, the VP domain done what in (20) will undergo transfer at the end of the vP phase, and copies of the moved constituents done and what will receive a null spellout. The derivation then proceeds by merging [T have] with the vP in (20), forming the T-bar below:

(21)

The T-probe have is active by virtue of its unvalued uninterpretable person/number agreement features, and searches for a nominal goal to value and delete its agreement features and become its subject. Since the closest nominal goal c-commanded by T-have is the pronoun what, let’s ask why have can’t agree with and attract what to become its subject. One way of ruling out the possibility of T agreeing with and attracting what would be in terms of a condition such as the following:
Inactivation Condition

A case-marked goal becomes inactive for agreement with (or attraction by) an A-head like T once its case feature has been valued and deleted.

Another condition which would prevent what from moving to spec-T in (20) is a constraint proposed in Chomsky (2005b) which bars Mixed Chains (See also the related Improper Movement Constraint in Ura 2001). Although Chomsky gives no specific formulation of the constraint, we can characterise it informally as follows:

Mixed Chains Constraint

Movement cannot give rise to a mixed chain containing one copy of a constituent which has moved to the edge of a phase, and another which has moved to the edge of a non-phasal projection.

Since what has moved to the edge of the vP phase in (22), the Mixed Chains Constraint (23) will bar subsequent movement of what to the edge of TP, because this would result in a chain in which what first moves to the edge of a phasal projection (= vP), and then moves from there to the edge of a non-phasal projection (= TP) – in violation of (23).

To summarise: the Inactivation Condition (22) means what is inactive and so cannot agree with have, and the Mixed Chains Constraint (23) further prevents what from moving to spec-T. By contrast, the pronoun they is active at this point because its case feature has not yet been valued. Accordingly, have agrees with, assigns nominative case to and attracts the pronoun they to move to spec-T, so deriving:

(24)

```
TP
  PRN
  they
    T'
      have
        vP
          PRN
          what
            PRN
            they
              v'
                v
                  VP
                    done+ø
                      done what
```

This TP is then merged with a null complementiser with a tense feature which triggers movement of have from T to C, and an edge feature which triggers movement of what to spec-C, so deriving:

(25)

```
CP
  PRN
  What
    C'
      have+ø
        TP
          PRN
          they
            T'
              have
                vP
                  PRN
                  what
                    PRN
                    they
                      v'
                        v
                          VP
                            done+ø
                              done what
```

At the end of the CP phase, TP undergoes transfer in accordance with (7i) and the italicised copies of moved constituents receive a null spellout in the phonological component. Subsequently, the constituents at the edge of CP (i.e. its specifier what and its head have+ø) undergo transfer in accordance with (7ii).

Our discussion of the derivation of (20) What have they done? shows us that A-bar movement in transitive clauses will involve movement through spec-v into spec-C. An obvious implication of this is that wh-questions like (26a) below which contain two transitive clauses will correspondingly involve successive-cyclic wh-movement through two spec-v positions (and likewise through two spec-C positions) – as shown in skeletal form in (26b):

(26) (a) What might she think that they will do?
(b) [CP What [c might] she [VP what think [CP what [c that] they will [VP what do what]]]]

More generally, a sentence containing n transitive verbs and m CPs intervening between the original position of a wh-expression and its ultimate landing site will involve movement through n spec-v positions and m spec-C positions.

As our discussion in this section illustrates, theoretical considerations lead us to conclude that, if CPs and transitive vPs are phases, wh-movement must involve movement through intermediate spec-C positions, and also through intermediate spec-v positions in transitive clauses. In §5.6 we presented empirical evidence that long-distance wh-movement involves movement through intermediate spec-C positions. An obvious question to ask at this juncture, therefore, is what empirical evidence there is that a transitive v agrees (in respect of one or more features with) a goal which it attracts to become its specifier. However, since English has impoverished agreement morphology, we will have to look at other languages for evidence of such agreement.

In this connection, it is interesting to note that Chung (1994, 1998) presents evidence that wh-movement out of a transitive verb phrase triggers wh-marking of the verb in Chamorro. We can illustrate this phenomenon in terms of the following example (from Chung 1998, p.242):

(27) Hafa si Maria s-in-angane-nña as Joaquin?
    What PN Maria wh-say.to-AGR OBL Joaquin (= ‘What did Maria say to Joaquin?’)

(PN denotes a person/number marker, AGR an agreement marker, and OBL an oblique case marker.) The crucial aspect of the the example in (27) is that the direct object hafa ‘what’ has been moved out of the transitive verb phrase in which it originates, and that this movement triggers wh-marking of the italicised verb, which therefore ends up carrying the wh-infix in. This suggests that a transitive light-verb carrying an edge feature attracts a wh-marked goal and undergoes agreement with the goal, resulting in the verb which is adjoined to the light-verb being overtly wh-marked. For further examples of wh-marking of intermediate verbs in long-distance wh-movement structures, see Branigan and MacKenzie (2002) on Innu-aimûn, and den Dikken (2001) on Kilega.


(28)(a) Il a commis quelle bêtise?
    He has committed what blunder
    ‘What blunder did he make?’
(b) Quelle bêtise il a commise?
    What blunder he has committed
    ‘What blunder did he make?’

The participle commis ‘committed’ is in the default (masculine singular) form in (28a), and does not agree with the feminine singular in situ wh-object quelle bêtise ‘what blunder’ (the final -e in these words can be taken to be an orthographic marker of a feminine singular form). However, the participle commise in (28b) contains the feminine singular marker -e and agrees with its preposed feminine singular object quelle bêtise ‘what blunder’ and consequently rhymes with bêtise. What’s going on here?
Let’s look first at the derivation of (28a). The QP *quelle bêtise* ‘what blunder’ in (28a) is merged as the complement of the verb *commis* ‘committed’ forming the VP *commis quelle bêtise* ‘committed what blunder’. The resulting VP is then merged with a null transitive light verb whose external AGENT argument is the pronoun *il* ‘he’; since the light-verb is affixal, it triggers movement of the verb *commis* ‘committed’ to adjoin to the light verb, in the manner shown by the arrow below:

(29)                        vP
                     PRN
                   il
                    v
                    v'
                      v
                        commis+ø
                           V
                              QP
                                 commis quelle bêtise

Being transitive, the verb *commis* assigns accusative case to the object *quelle bêtise* ‘what blunder’. By hypothesis, the light verb has no edge feature in wh-in-situ questions, so there is no movement of the wh-phrase *quelle bêtise* ‘what blunder’ to spec-v. Subsequently the vP (29) is merged as the complement of the auxiliary *a* ‘has’ which agrees in person/number φ-features with (and triggers movement to spec-T of) the subject *il* ‘he’. Merging the resulting TP with a null complementiser which likewise has no edge feature derives the structure associated with (28a) *Il a commis quelle bêtise?* (literally ‘He has committed what blunder?’).

Now consider the derivation of (28b). This is similar to that of (28a), until we reach the stage of derivation shown in (29) above. However, in a non-echoic question, the light-verb will have an edge feature which attracts the wh-marked object *quelle bêtise* ‘what blunder’ to move to become an additional (outer) specifier for the vP, in the manner shown by the arrow below:

(30)                                  vP
                     QP
                   quelle bêtise
                     PRN
                   il
                    v
                    v'
                      v
                        commis+ø
                           V
                              QP
                                 commis quelle bêtise

The resulting vP (30) is then merged as the complement of the auxiliary *a* ‘has’ which agrees in φ-features with (and triggers movement to spec-TP of) the subject *il* ‘he’. Merging the resulting TP with a null interrogative complementiser which has a wh-attracting edge feature triggers movement of the wh-phrase to spec-CP, so deriving the structure associated with (28b) *Quelle bêtise il a commise?* (literally ‘What blunder he has committed?’).

In the light of the assumptions made above, consider why the participle surfaces in the agreeing (feminine singular) form *commise* ‘committed’ in the wh-movement structure (28b), but in the non-agreeing (default) form *commis* in the wh-in-situ structure (28a). In this connection, it is interesting to note the observation made by McCloskey (2001) that in Irish, a complementiser only overtly agrees with a wh-expression which it attracts to move to spec-C (not with an in-situ wh-expression). What this suggests is that French participles only overtly inflect for number/gender agreement with their object if they have an edge feature which forces movement of a nominal through spec-v. However, any such assumption requires us to suppose that wh-movement proceeds through spec-v in transitive clauses, and hence lends further support for Chomsky’s claim that transitive vPs are phases. (The discussion here is simplified in a
number of respects for expository purposes, e.g. by ignoring the specificity effect discussed by Richards 1997 pp.158-160, and additional complications discussed by Ura 2001.)

Further evidence in support of successive-cyclic wh-movement through spec-vP in transitive clauses comes from observations about mutation in Welsh made in Tallerman (1993). Tallerman claims that wh-traces trigger so-called soft mutation of the initial consonant of a following word. In this connection, consider the sentence in (31) below (where PROG denotes a progressive aspect marker):

(31) Beth wyt ti ’n feddwl oedd gin I?
What are you PROG think was with me (= ‘What do you think I had?’)

What is particularly interesting here is that the italicised verb has undergone soft mutation (so that in place of the radical form meddwl ‘think’, we find the mutated form feddwl. Given independent evidence that Tallerman produces in support of claiming that wh-traces induce mutation, an obvious way of accounting for the use of the mutated verb-form feddwl ‘think’ in (31) is to suppose that the wh-pronoun beth ‘what’ moves through spec-v on its way to the front of the overall sentence. We can then suppose that a wh-trace on the edge of vP triggers soft mutation on the lexical verb adjoined to the light-verb heading the vP (though see Willis 2000 for a slightly different account of Welsh mutation.)

9.6 Uninterpretable features and feature inheritance
Throughout the book so far, we have assumed that non-phasal heads like T and V (in structures where they assign nominative or accusative case respectively) enter the derivation carrying not only interpretable features, but also uninterpretable agreement features. For example, T (in addition to carrying an interpretable tense features) carries uninterpretable person/number features which are valued via agreement with (and work in conjunction with EPP to trigger movement of) an active noun or pronoun expression which is assigned nominative case via agreement with T. However, in recent work, Chomsky (2005b, 2006) and Miyagawa (2005) have argued that non-phasal heads enter the derivation carrying only interpretable features, and that they inherit their uninterpretable features from the phase head. This means (for example) that the phase head C is not only the locus (i.e. source) of interpretable features (e.g. C marks declarative/interrogative/imperative force) but is also the locus of the uninterpretable agreement features carried by T. Chomsky’s reasoning is along the following lines. T only carries a complete set of (person and number) agreement features in a clause where it is selected by C, not in a defective (CP-less) clause. In this connection, consider the contrast between the two complement clauses bracketed below:

(32)(a) They think [cp [that] [tp he [T has] arrived]]
(b) He does seem [tp [T to] have arrived]

Given the assumptions we made in chapter 7, the bracketed TP in (32a) is selected by the C-constituent that, and the head T of TP is the auxiliary has which carries a complete set of person/number agreement features. By contrast, the TP in the raising structure in (32b) is not selected by C, and its head T constituent to is defective in that it does not carry a complete set of agreement features. Reasoning thus, Chomsky concludes that the person/number agreement features of T must originate on C, and subsequently ‘be inherited by’ or ‘be handed over to’, or ‘percolate down onto’ (three different metaphors expressing the same idea) the T constituent immediately beneath C.

Chomsky argues that in the same way, the agreement features carried by a transitive V (which enable it to assign accusative case to a goal within its domain) are inherited from the light-verb which is the head of the relevant vP phase (transitive vPs being phases). One reason for thinking this can be illustrated in relation to the following contrast:

(33)(a) They have sent the chairman to Paris (b) The chairman has been sent to Paris

Both the transitive sentence (33a) and the intransitive (passive) sentence (33b) contain a VP comprising the verb sent and two internal arguments (the DP the chairman and the PP to Paris). However, the V sent agrees with and assigns accusative case to the DP the chairman in the transitive structure (33a), but not in the intransitive structure (33b) where the chairman is assigned nominative case by agreement with the T-auxiliary has. Whether or not the DP receives accusative case cannot be determined by the internal structure of the VP, since this contains the same three constituents in the two sentences (namely the verb sent, the DP the chairman and the PP to Paris). Rather, what determines that accusative case is assigned to
the DP in the transitive sentence (33a) but not in the intransitive sentence (33b) is the fact that the vP has a thematic external argument (namely they, which occupies the specifier position within vP) in the transitive structure (33a), but has no external argument (and hence no specifier) in the intransitive structure (33b). A plausible way of accounting for this is to suppose that a light-verb only carries agreement features if it has a thematic external argument. However, since it is V rather than v which agrees with and assigns accusative case to an active noun or pronoun expression within its domain and can attract it to become its specifier, it is clear that v must ‘hand over’ its agreement features to V once the vP phase is formed.

Chomsky (2006) offers a further theoretical argument in support of positing that agreement features originate on a phase head, and then percolate down onto the head beneath it (from C onto T, and from v onto V). Since uninterpretable features have to be visible in the PF component but invisible in the semantic component, he posits that deletion of uninterpretable features takes place as part of the operation by which the domain (i.e. complement) of a phase head is transferred to the semantic component. This will ensure that the structure transferred to the PF component contains both interpretable and uninterpretable features, but the structure transferred to the semantic component contains only interpretable features. However, this also means that (since only the domain of a phase head undergoes transfer at the end of a phase, not the phase head itself), any features remaining on the phase head will not be deleted. And if undeleted features which are valued are taken by the grammar to be interpretable, uninterpretable features remaining on the phase head (by virtue of being valued but not deleted) will wrongly be taken to be interpretable. In short, this means that unless a phase head ‘hands over’ its uninterpretable features to the head beneath it, the derivation will crash.

To make a rather abstract discussion more concrete, let’s take a closer look at the derivation of (32a) It does seem that he has arrived. The unaccusative verb arrive merges with its pronoun argument he to form the VP arrive he. This VP in turn merges with an intransitive light verb (with no external argument). The vP thereby formed (which is not a phase because it is intransitive by virtue of having no thematic external argument) is merged with a T constituent containing have, forming a TP which is in turn merged with the complementiser that to form a CP. If the person/number agreement features in the clause originate on the phase head C, the merger operations which take place on the complement-clause CP phase will derive the structure shown in simplified form below:

\[
\text{CP} [\text{C that$_3$-Pers, Sg-Num}] [\text{TP [\text{TP [have] [VP [\text{VP [arrive] he$_3$-Pers, Sg-Num]]]]]]]
\]

(Since our focus here is on agreement, we ignore other features such as case.) If features which are unvalued prior to agreement applying on a phase are treated by the grammar as uninterpretable and those which are valued prior to agreement are treated as interpretable, the grammar will ‘know’ that the person/number agreement features on the complementiser that (by virtue of being unvalued) are uninterpretable, but those on the pronoun he (by virtue of being valued) are interpretable.

Consider now what would happen if the person/number agreement features on the phase head C remained on C and were not inherited by T. C would then agree directly with he, and the agreement features on C would be assigned the values [third-person, singular-number], so deriving the structure (35) below:

\[
\text{CP} [\text{C that$_3$-Pers, Sg-Num}] [\text{TP [\text{TP [have] [VP [\text{VP [arrive] he$_3$-Pers, Sg-Num]]]]]]}
\]

This would then pose obvious empirical problems, e.g. in accounting for why it is the T-constituent have rather than the C-constituent that which overtly inflects for agreement with he, and why the subject he raises to spec-TP and not to spec-CP (since we saw in chapter 7 that a head with agreement features can attract a goal with an active case feature to becomes its specifier). But even if we manage to overcome these problems somehow, the additional theoretical problem identified by Chomsky arises – for the following reason. At the end of the CP phase, the domain of the phase head (its TP complement he has arrived) undergoes Transfer to the PF component on the one hand, and to the semantic component on the other. Given the assumption that feature-deletion takes place during transfer to the semantic component, then since only TP undergoes transfer at the end of the CP phase, only the uninterpretable features on constituents of TP will be deleted, not the uninterpretable person/number features on the phase head C. The derivation then continues with the verb think being merged with its that-clause complement to form a VP which in turn is merged with a light-verb with the external argument they. The result is that via a series of merger operations on the main-clause vP phase, we form the structure shown in simplified form below.
(36)  \[ \lambda \phi \text{ they}_3 \text{-Pers, Pl-Num} [\text{v} \ \emptyset] [\text{vP} [\text{v} \ \text{think}] [\text{CP} [\text{C that}_3 \text{-Pers, Sg-Num} \text{ he has arrived }]] \]

One of the problems which now arises is that (if the grammar takes any feature which is already valued prior to the operation of agreement on a phase to be interpretable), it will correctly assume that the valued person/number features on they are interpretable, but will also wrongly assume that the valued person/number features on that are interpretable. The derivation will therefore crash, since the semantic component is unable to make sense of (i.e. assign any coherent interpretation to) person/number features on a complementiser.

However, the various problems which arise if the agreement features remain on phase heads can be resolved if we suppose that all uninterpretable features on a phase head are handed down to (and hence inherited by) a subordinate head. To see how, let’s go back to our earlier structure in (34), repeated as (37) below:

(37)  \[ \text{[CP [C that}_u \text{-Pers, u-Num} [\text{TP [r have}_u \text{-Pers, u-Num} [\text{vP [v \ \emptyset] [\text{vP} [\text{v} \ \text{arrive} \text{ he}_3 \text{-Pers, Sg-Num}]]]]]]] \]

Immediately after Merger has formed the structure (37) and before operations like Agreement, Case Marking and Movement take place, the uninterpretable person/number agreement features on C are handed over to the T constituent immediately below it, so deriving the structure (38) below:

(38)  \[ \text{[CP [C that] [TP [r have}_u \text{-Pers, u-Num} [\text{vP [v \ \emptyset] [\text{vP} [\text{v} \ \text{arrive} \text{ he}_3 \text{-Pers, Sg-Num}]]]]] \]

The derivation then proceeds in ways familiar from chapter 7. That is, T agrees with the pronoun he (thereby valuing the agreement features on T), and attracts he to move to spec-TP, so deriving the following structure (where t denotes a trace copy of the moved pronoun he):

(39)  \[ \text{[CP [C that] [TP [r have}_3 \text{-Pers, Sg-Num} [\text{vP [v} \text{ he}_3 \text{-Pers, 3-Num} [\text{vP [v \ \text{arrive} \ r]]]]]]]} \]

At the end of the CP phase, the TP domain will undergo Transfer. During transfer to the semantic component, features which were unvalued at some stage of derivation during the relevant phase are deleted. Since the person/number features on the T auxiliary have were unvalued at the stage represented in (38), they get deleted when the TP domain is transferred to the semantic component. By contrast, since the person/number features on he were valued throughout the phase, they are not deleted and so are assigned an appropriate interpretation in the semantic component. When subsequent merger operations form the matrix vP phase shown in simplified form below:

(40)  \[ \lambda \phi \text{ they}_3 \text{-Pers, Pl-Num} [\text{v} \ \emptyset] [\text{vP} [\text{v} \ \text{think}] [\text{CP [C that} \text{ he has arrived }]] \]

the problem which arose in our earlter structure (36) of that carrying valued number features no longer arises, because these features were handed over to T on the earlier CP phase. The remaining part of the derivation of (40) proceeds in familiar ways, ultimately deriving (32a) They think that he has arrived.

To summarise: in recent work, Chomsky (2005b, 2006) argues that phase heads enter the derivation carrying both interpretable and uninterpretable features, but that other heads enter the derivation carrying only interpretable features. After a series of Merger operations have applied to build up a particular phase structure (and before case/agreement/movement operations apply), the phase head ‘hands over’ its uninterpretable features to the head beneath it, so that e.g. T inherits its agreement features from C, and transitive V inherits its agreement features from v. This inheritance operation is necessary because uninterpretable features on a phase head (once valued) would be wrongly ‘seen’ by the grammar as interpretable.

While the picture painted in the preceding paragraph might seem relatively clear, it should be pointed out there are a number of factors which cloud it in certain respects. For example, if T in defective clauses like that bracketed in (32b) above enters the derivation carrying an uninterpretable and unvalued number feature (as assumed in our discussion in chapter 7), it is clear that it cannot inherit this via selection by a C head immediately above it if defective clauses are TPs which contain no CP projection. Likewise, the assumption that the grammar treats all features within a phase which are valued prior to the operation of agreement as interpretable is at variance with our assumption that expletive pronouns enter the derivation carrying valued but uninterpretable features (though this assumption may of course be misplaced); and gender features on nouns (like the French feminine noun table ‘table’) in languages with arbitrary gender
pose parallel problems, if such nouns enters the derivation carrying a gender feature which is already valued but uninterpretable. Similarly, the claim that a phase head must hand over its uninterpretable agreement features to a head below it raises questions about how we deal with complementiser agreement (a phenomenon discussed in Rizzi 1990, Haegeman 2002, Boecks 2003, Carstens 2003, Kornfilt 2004, and Miyagawa 2005). For example, Haegeman (1992, p. 47) notes that in West Flemish ‘the complementiser of the finite clause agrees in person and number with the grammatical subject of the sentence it introduces’, and provides a list of illustrative examples (p.49) which include the following:

(41)(a) Kpeinzen dank ik morgen goan  
I.think that1.Sg I tomorrow go (‘I think that I’ll go tomorrow’)

(b) Kpeinzen daj gie morgen goat  
I.think that2.Sg (you) tomorrow go (‘I think that you will go tomorrow’)

(c) Kpeinzen dan Valère en Pol morgen goan  
I.think that3.Pl Valere and Paul tomorrow go (‘I think that Valere and Paul will go tomorrow’)

The fact that the italicised complementiser overtly inflects for subject-agreement poses a potential problem for Chomsky’s claim that a phase head like C must hand over its agreement features to a subordinate head.

Another type of structure which is seemingly problematic for Chomsky’s inheritance analysis are so-called double-object structures such as:

(42) She will give me them

One analysis of such structures which would seem to be in keeping with the split projection analysis of verb phrases outlined in the previous chapter would be to suppose that the verb phrase in (43) has the split projection structure shown in simplified form in (43) below:

(43) \[ [vP she [v, \emptyset] [vP them [V give] me]] \]

We might further suppose that v hands its agreement features over to V, and that V agrees with, assigns accusative case to, and triggers movement to spec-VP of me, so deriving the following structure (once give adjoins to v):

(44) \[ [vP she [v, give \emptyset] [vP me them [V give] me]] \]

But such an analysis is problematic in various respects. For one thing, it leaves unanswered the question of how them comes to be assigned case. It cannot be assigned accusative case by agreement with V for two reasons: one is that them is in spec-VP in (43) and so not in the domain of V; and secondly, V cannot agree both with the first person singular pronoun me and with the third person plural pronoun them, because this would lead to V having conflicting agreement specifications (needing to be both first person singular and third person plural at the same time). We might of course envisage the possibility of of them being assigned accusative case via agreement with the light-verb in (43): but any such possibility is ruled out by Chomsky’s assumption that uninterpretable agreement features on a phase head always percolate down onto the head beneath. In short, it is not at all obvious how to handle double object structures within the kind of uninterpretable feature inheritance framework developed by Chomsky. (We might also note in passing that potential problems also arise in relation to Object Control structures, since if the controller of PRO originates as the complement of V and the PRO-clause as the specifier of V, the controller will not c-command PRO – e.g. in structures like (93) in §8.8.)

More generally – as we have seen – Chomsky’s inheritance analysis raises numerous as yet unanswered questions about how to analyse a range of structures which prove potentially problematic for the assumptions he makes. However, in what follows below, we will adopt the inheritance assumption as far as possible.

### 9.7 Independent probes

Hitherto, we have adopted the classic bottom-up cyclic account of derivations under which e.g. (within a given clause) T-operations (i.e. movement and agreement operations involving a T-probe and one of more goals) apply before C-operations (i.e. operations involving a C-probe and one or more goals): and indeed, this sequential ordering of operations was assumed to be a consequence of the Earliness
Principle, in that T is introduced into the derivation before C, so T-operations apply immediately T is introduced into the derivation, and hence before C-operations. However, the revised conception of derivations outlined in the previous section means that this view is no longer tenable. After all, if T inherits its uninterpretable agreement features from C (as Chomsky claims), then it follows that the percolation operation by which uninterpretable features percolate down from C to T must take place before T can serve as a probe for agreement, case-marking and movement, since it is only once T has acquired uninterpretable agreement features from C that it can become an active probe for agreement, case and movement operations. Consequently in recent work, Chomsky maintains that it is only after Merger operations have built up a complete phase structure that movement and agreement operations can apply. Furthermore, he also posits that each separate head within a phase can probe independently of any other probe within the same phase, in a random fashion (with some possibilities yielding a convergent outcome, and others causing a crash). In this section, we look at evidence that different heads within a phase can probe independently and in any order (e.g. C can probe before T, or T can probe before C, or C and T can probe simultaneously). However, before doing this (and by way of background information), let’s first examine two constraints on movement which will play an important part in our subsequent exposition in this section.

In this connection, consider the following contrast:

(45)(a) They believe [John to be innocent]    (b) John is believed [to be innocent]
      (c) They believe [John is innocent]    (d) *John is believed [is innocent]

As we see from (45a, b), the subject of a defective TP (e.g. an infinitive clause which is the subject of a ECM predicate like believe) can passivise, but not the subject of a non-defective (e.g. finite) TP. This suggests that the specifier of a non-defective TP is barred from undergoing further A-movement operations. However, contrasts such as that below:

(46)(a) Of which party do you believe [the leader to have committed suicide]?
(b) *Of which party do you believe [the leader has committed suicide]?

suggest that A-bar movement is likewise possible out of the subject of a defective TP as in (46a), but not out of the subject of a complete (non-defective) TP as in (46b). The observation that both A-movement and A-bar movement are barred out of the subject/specifier of a complete TP leads Chomsky (2005b) to suggest that the subject/specifier of a complete TP is invisible to further operations (and hence to higher probes). We can characterise this constraint informally as follows:

(47) **Invisibility Condition**

The specifier of a complete (non-defective) TP is invisible to any higher probe

The constraint in (47) provides a straightforward account of why the subject of the bracketed complete TP cannot be passivised in (45d), and why the PP of which party cannot be extracted out of the DP the leader of which party which is the subject of the bracketed complete TP in (46b).

A second constraint which will also play a part in our discussion below can be illustrated in terms of the ungramaticality of:

(48) *Of which car is it unclear which driver they arrested?

On the main-clause CP phase, wh-movement will involve the movement operation indicated by the arrow in the structure shown in skeletal form below (simplified in numerous ways, including by showing only CPs, and only wh-copies on the edge of CP):

(49) `\[CP Of which car it is unclear [CP which driver of which car they arrested]]`

What prevents the PP of which car from being extracted out of the DP which driver of which car? Chomsky (2005b) suggests the following constraint:

(50) **Specifier Condition**

No subextraction is possible out of a constituent which is a specifier of a phase head

Since the DP which driver of which car occupies spec-CP in (49) and hence is the specifier of the phase head C, the Specifier Condition (50) prevents the PP of which car from being subextracted out of it.
Having outlined two background assumptions about conditions on movement, let’s now turn to the main point of our discussion in this section – namely to argue that different heads (like C and T) probe independently of each other on a given phase. Chomsky (2005b) observes that traditional bottom-up cyclic accounts of syntax fail to account for contrasts such as the following:

(51) (a) *Of which car has the driver caused a scandal?
   (b) Of which car was the driver arrested?

More specifically, he maintains that the existing bottom-up account would wrongly predict that (51b) is ungrammatical. To see why both sentences would be predicted to be ungrammatical under a bottom-up account, let’s take a look at the derivation of each of the two sentences in (51), beginning with (51a). This is derived as follows.

The verb *cause* merges with the QP *a scandal* to form the VP *cause a scandal*. This VP in turn merges with a transitive light verb to form a v-bar which in turn merges with the DP *the driver of which car* to form the vP shown in simplified form below (with the verb *cause* raising to attach to the light verb, and the QP *a scandal* being assigned accusative case by V, which inherits agreement features from v):

(52)

```
 vP
   DP
     the driver
       of which car
       v
         cause+ø
         VP
           cause
           QP
             a scandal
```

The vP in (52) is then merged with the past-tense T-auxiliary HAVE, which agrees with, case-marks, and triggers movement of the DP *the driver of which car* to spec-T (as well as determining that the verb *cause* is spelled out in the perfect participle form *caused*). Merging the resulting TP with a null interrogative C forms the structure shown below (simplified in a number of ways, including by only showing overt constituents of vP):

(53)

```
 C'
   C
     ϕ
       TP
         DP
           the driver
             of which car
             T'
               vP
                 has
                   cause
                     a scandal
```

The interrogative C carries a tense feature triggering movement of *has* from T to C, and an edge feature triggering movement of a maximal projection containing a wh-word to spec-C. We might therefore expect C to be able to trigger movement of the wh-PP *of which car* to spec-CP, as in (54) below:

(54)

```
 CP
   PP
     Of which car
     C'
       C
         has
           DP
             the driver
               of which car
               T'
                 vP
                   has
                     cause
                       a scandal
```

However, the resulting sentence (51a) *Of which car has the driver caused a scandal?* is ungrammatical. The reason is that the arrowed movement in (54) violates the Invisibility Condition (47) which renders the specifier of a non-defective TP invisible to any higher probe: since the DP *the driver of which car* in (53)
is the specifier of a finite (non-defective) TP headed by the finite T-auxiliary has, the whole DP is invisible to the higher probe C, and hence C cannot attract the PP of which car to move to spec-C.

Now consider how we would derive (51b) Of which car was the driver arrested? In terms of our existing assumptions, this would be derived as follows. The verb arrest merges with its complement the driver of which car to form the VP arrest the driver of which car. This VP is in turn merged with an intransitive light-verb (with no external argument) which triggers raising of the verb arrest from V to v, forming the vP shown in simplified form below:

\[
\begin{align*}
(55) & \\
& \text{vP} \\
& \quad \text{v} \\
& \quad \text{arrest+Ø} \\
& \quad \text{VP} \\
& \quad \text{V} \\
& \quad \text{arrest} \\
& \quad \text{DP} \\
& \quad \text{the driver of which car}
\end{align*}
\]

The participial nature of the light-verb means that the verb ARREST is ultimately spelled out in the passive participle form arrested. The vP in (55) is then merged with the past-tense T-auxiliary BE, which agrees with, case-marks, and triggers movement of the DP the driver of which car to spec-T. Merging the resulting TP with a null interrogative C forms the structure shown in skeletal form below (simplified in a number of ways, including by not showing null constituents of vP):

\[
\begin{align*}
(56) & \\
& \text{C'} \\
& \quad \text{C} \\
& \quad \text{Ø} \\
& \quad \text{TP} \\
& \quad \text{DP} \\
& \quad \text{the driver of which car} \\
& \quad \text{T'} \\
& \quad \text{was} \\
& \quad \text{vP} \\
& \quad \text{arrested}
\end{align*}
\]

As in all finite main-clause non-echoic questions, C carries a tense feature triggering movement of was from T to C, and an edge feature triggering movement of a wh-expression (more precisely, a maximal projection containing a wh-word) to spec-C. We might therefore expect C to be able to attract the PP of which car to move to spec-C in the manner shown by the arrow below:

\[
\begin{align*}
(57) & \\
& \text{CP} \\
& \quad \text{PP} \\
& \quad \text{Of which car} \\
& \quad \uparrow \\
& \quad \text{C'} \\
& \quad \text{C} \\
& \quad \text{was} \\
& \quad \text{TP} \\
& \quad \text{DP} \\
& \quad \text{the driver of which car} \\
& \quad \text{T'} \\
& \quad \text{was} \\
& \quad \text{vP} \\
& \quad \text{arrested}
\end{align*}
\]

However, subextraction of the PP of which car out of the DP the driver of which car is blocked by the Invisibility Condition (47), which renders the specifier of a non-defective TP invisible to any higher probe. Accordingly, the C-probe in (56) cannot ‘see’ the PP of which car in (56), because this PP is part of a larger DP the driver of which car which is itself invisible to a higher probe like C. Consequently, on our existing assumptions, sentence (51b) Of which car was the driver arrested? is wrongly predicted to be ungrammatical. What has gone wrong here?

Chomsky (2005b, p.13) suggests that the answer lies in the traditional (bottom-up) assumption that operations involving lower (= subordinate) probes must necessarily apply before operations involving higher (= superordinate) probes. He argues instead for the alternative position that (within a given phase) different heads can probe in a random fashion – either one before the other, or simultaneously (‘in parallel’, to use the terminology of Chomsky 2005b, p.13). Let’s see how the parallel probes assumption help us account for the contrast between (51a) and (51b).
Consider first the derivation of (51b) *Of which car was the driver arrested?* and suppose that we have arrived at a stage of derivation at which we have formed the vP shown in (55) above. Let’s further suppose that this vP merges with a past-tense T-constituent containing BE to form a TP which in turn merges with a null interrogative C constituent, deriving the CP shown below:

\[\text{(58)}\]

\[
\begin{array}{c}
\text{CP} \\
\text{C} \\
\phi \\
\text{TP} \\
\text{T} \\
\text{be} \\
vP \\
v \\
\phi \\
\text{V} \\
\text{arrest} \\
\text{DP} \\
\text{the driver of which car}
\end{array}
\]

In other words, assume that the v, T and C heads within the CP phase are all introduced into the derivation before any of them can probe. In order to simplify our discussion, let’s set aside the participial light verb which attracts the verb arrest to adjoin to v (a type of movement that may, in any case, be a PF-operation), and instead concentrate on the C and T probes, and look at what happens if these probe simultaneously. This means that at the same time as the T-auxiliary BE can agree with the (bold-printed) DP *the driver of which car* and attract a copy of it to move to spec-T, and the null interrogative C-constituent can simultaneously attract a copy of the (italicised) PP *of which car* to move to spec-C (as well as attracting a copy of BE to move from T to C – though as noted in chapter 4, V-to-v movement and T-to-C movement may be a different type of head movement operation which takes place in the PF component). These operations lead to the formation of the structure (59) below (with a dotted arrow showing A-movement to spec-T, and a slashed arrow showing A-bar movement to spec-C):

\[\text{(59)}\]

\[
\begin{array}{c}
\text{CP} \\
\text{DP} \\
\text{Of which car} \\
\text{C} \\
\phi \\
\text{be+Ø} \\
\text{TP} \\
\text{T} \\
\text{be} \\
vP \\
v \\
\phi \\
\text{V} \\
\text{arrest+Ø} \\
\text{VP} \\
\text{arrest} \\
\text{DP} \\
\text{the driver of which car} \\
\text{the driver} \\
\text{of which car}
\end{array}
\]

There is no violation of the Invisibility Condition (47) because the PP *of which car* is being extracted out of a DP (*the driver of which car*) at the foot of the tree which is the complement of the verb arrest, and not out of a DP which is the subject of a non-defective T. Dual movement results in a structure containing three copies of the PP *of which car* – namely the original one within VP, a second one which ends up in spec-T as part of the moved DP *the driver of which car*, and a third one which moves on its own from complement position in VP into specifier position within CP. Given that only the highest copy of a moved constituent is overtly spelled out, it follows that only the highest of the three copies of the PP *of which car* will be overtly spelled out (namely that in spec-C): likewise, only the highest copy of the string *the driver* is overtly spelled out (namely that in spec-T). Assuming that BE is ultimately spelled out as was and ARREST as the passive participle arrested, the structure in (59) will be spelled out in the PF component as (51b) *Of which car was the driver arrested?*
Now let’s return to consider the derivation of the ungrammatical sentence (51a) *Of which car has the driver caused a scandal? Let’s suppose that we have reached a stage of derivation at which we have formed the vP phase in (52) above, and that we then merge this vP with the T-auxiliary HAVE to form a TP which is in turn merged with an interrogative C constituent to form the CP shown below:

(60) CP
    C
      ø
      T
      have
    vP
      DP
      the driver
      of which car
    v
    v'
    VP
    cause+ø
    V
    cause
    DP
    cause an accident
  of which car

Given Chomsky’s assumption that C and T can probe simultaneously, what we might expect to be possible here is for T to agree with and case-mark the DP the driver of which car and attract a copy of it to move to spec-T, and for C to simultaneously attract a copy of the PP of which car to move to spec-C (as well as attracting a copy of the auxiliary HAVE to move to C), as shown by the arrows in the structure below (simplified in familiar ways):

(61) CP
    DP
      Of which car
    C
      have+ø
    C'
    TP
    T'
      T
      have
    vP
      DP
      the driver
      of which car
    v'
    V
    cause
    DP
    cause an accident
  of which car

Since HAVE/CAUSE are spelled out as has/caused in the PF component and only the highest copy of each constituent is overtly spelled out, the resulting structure will ultimately be spelled out as (51b) *Of which car has the driver caused a scandal? But the resulting sentence is ungrammatical. Why should this be?

The answer is that subextraction of the PP of which car out of the DP the driver of which car violates the Specifier Condition (50) which bars subextraction out of a constituent which is a specifier of a phase. Since vP in (61) is a phase (by virtue of the light verb having a thematic external argument), and since the DP the driver of which car is the specifier of this vP phase, the wh-movement operation indicated by the slashed arrow in (61) leads to violation of the Specifier Condition, and to consequent ungrammaticality.

Note, incidentally, that it would not be possible to attempt to avoid violating the Specifier Condition by moving the PP of which car to spec-v at the stage of derivation in (52) above (and subsequently to spec-C) because (as Chomsky 2005b, p.14 notes) the PP of which car in (52) is not in the search domain of (i.e. is not c-commanded by) the null light-verb.

So far in this section, we have outlined Chomsky’s account of why subextraction is possible out of the subject of a passive clause, but not out of the subject of a transitive clause. Note that a crucial theoretical assumption underlying Chomsky’s analysis is that C and T can probe independently and simultaneously. However, there is evidence from transitive sentences like (20) What have they done? that C and T do not always probe simultaneously. In this connection, suppose that we have reached the stage of derivation shown below (with what having moved to the edge of the vP phase on the v-cycle, and VP having
undergone transfer at the end of the vP phase):

\[ \text{CP} \]

\[ \text{C} \]

\[ \phi \]

\[ \text{T} \]

\[ \text{TP} \]

\[ \text{vP} \]

\[ \text{have} \]

\[ \text{PRN} \]

\[ \text{what} \]

\[ \text{v} \]

\[ \text{PRN} \]

\[ \text{they} \]

\[ \text{v} \]

\[ \text{do+\phi} \]

\[ \text{PRN} \]

\[ \text{do} \]

\[ \text{VP} \]

\[ \text{V} \]

\[ \text{what} \]

At this point, T needs to be able to attract the bold-printed subject they to move to spec-T, and C needs to be able to attract the italicised wh-object what to move to spec-C. Let us suppose that only the highest copy (or link) in a movement chain is visible to a superordinate probe in the syntax – a constraint which we can characterise informally as follows:

**Visibility Condition**

Only the highest copy in a movement chain is visible in the syntax (other copies being inert)

Moreover, suppose that we capture Chomsky’s (2005b, p.8) insight that a ‘probe agrees with goals in its domain as far as a goal with no unvalued features, which blocks further search’ in terms of a condition along the following lines:

**Intervention Condition**

Probe P cannot target goal G if there is some other visible goal of the same kind as G intervening between the two and if the intervening goal is inactive

Independent motivation for such a condition (according to Chomsky 1998, p.45, fn.94) comes from the ungrammaticality of double-there sentences such as:

\[ *\text{There are likely there to be problems} \]

where the intervening italicised occurrence of there blocks agreement between are and problems.

In the light of the Intervention Condition in (64), let’s now consider what happens next in (62). Suppose that T probes first and C afterwards, or that T and C probe simultaneously. In either eventuality, the Intervention Condition (64) will prevent the T-auxiliary have from targeting the subject they because the (italicised) highest occurrence of the pronoun what intervenes between the two, and because what is inactive for A-operations (i.e. operations involving a probe like T in an A-position) because its case feature was deleted on the vP phase. But now let’s make the alternative assumption that C probes before T in (62). If so, C will attract what to move to spec-C, thereby deriving the structure shown in simplified form below (with do ultimately being spelled out as done in the PF component):

\[ [\text{CP what} [\text{C }\phi] [\text{TP they} [\text{V} \text{have} [\text{VP what they [v done] [vp [V done] what]]]]]] \]

Subsequently, the T-auxiliary have can probe separately and attract the subject they to move to spec-T, because although the copy of what which intervenes between have and they is inactive, it is not the highest copy of what (the highest copy of what being the italicised one at the front of the overall sentence).

Movement of the subject they to spec-T derives the structure:

\[ [\text{CP what} [\text{C }\phi] [\text{TP they} [\text{V} \text{have} [\text{VP what they [v done] [vp [V done] what]]]]]] \]

Subsequent auxiliary inversion (in the PF component, if head movement is a PF operation) together with deletion of all but the highest copies will then derive the superficial structure associated with (20) *What have they done?* Thus, only if C probes before T in an object-question structure like (58) will the derivation yield a successful outcome.
Since C and T sometimes probe simultaneously and sometimes sequentially, Chomsky (2005b, p.17) concludes that ‘All options are open’ so that C and T can probe ‘in either order, or simultaneously, with only certain choices converging’ (i.e. resulting in a well-formed sentence). In other words, sometimes C probes before T, sometimes T probes before C, and sometimes the two probe at the same time.

### 9.8 Subject questions

The assumption that T and C function as independent probes has interesting implications for the syntax of subject questions (i.e. clauses whose subject is interrogative) like those below:

(68a) Who died? (b) Who killed the president?

(68a) is derived as follows. Die is an unaccusative predicate which merges with the pronoun who to form the VP die who. This VP is then merged with a null light-verb, thereby forming the vP ø die who. The resulting vP is then merged with a T constituent containing a past-tense affix (below denoted as Af) so forming a TP which is in turn merges with an interrogative C to form the CP shown below:

(69) CP

C

TP

T

Af

vP

v

Ø

VP

V

PRN

die

who

C, T and v then probe independently of each other. The light-verb attracts the verb die to adjoin to it. Since C and T both locate the same goal who, they probe simultaneously. (If C were to probe before T, T would be unable to agree with, case-mark or attract who; If T were to probe before C and attract who to spec-T, the Invisibility Condition would prevent C from subsequently attracting who to move from spec-T to spec-C – as indeed would a constraint against mixed chains). The T-affix picks out who as a goal which is active by virtue of its unvalued case feature, and agrees with and assigns nominative case to who, and also attracts a copy of who to move to spec-T. C probes simultaneously and identifies who as the closest (and only) interrogative goal in its search domain, and attracts a separate copy of who to move to spec-C, in the manner shown by the arrows below:

(70)

As (70) shows, one copy of who is created in spec-T via A-movement, and a second (separate) copy of who is created in spec-C via A-bar movement. In the PF component, the highest copy of who (= the one in spec-C) is given an overt spellout. Since there is no T-to-C movement in subject questions, the past-tense
affix remains in T in the syntax, and is lowered from T onto V in the PF component, with the result that the verb DIE is ultimately spelled out as died.

A residual question glossed over (and left unanswered) in the analysis of subject questions sketched above is why subject questions like (68a, b) above don’t show T-to-C movement (and concomitant DO-support) – as we see from the following fuller set of examples (where ‘d’ is a contracted form of did):

(71) (a) Who died?/*Who’d die (= Who did die?)
(b) Who killed the president?/*Who’d kill the president? (= Who did kill the president?)

Why should there be no T-to-C movement (and DO-support) in subject questions? Recall that in §5.8 we noted that Pesetsky and Torrego (2001) answer this question by positing that the subject of a tensed clause acquires a tense feature via agreement with a tensed T. Accordingly, who in (70) acquires a tense feature via agreement with the past tense affix in T. Consequently, the requirements of both the edge feature [EF] and the tense feature [TNS] carried by C in main-clause questions can be satisfied by movement of a the tensed interrogative subject who to spec-C – thereby obviating the need for T-to-C movement.

However, a complication which arises is the following. If (in a wh-subject question structure like 69) T and C probe the same goal (who) at the same time, then at the point when they probe, who will not yet have acquired the tense feature which it gets from T, so C will not be able to identify who as a tensed goal. Thus, in order to adapt Pesetsky and Torrego’s account of auxiliary inversion to Chomsky’s framework, we have to assume that the agreement features on T probe first, locating who as their goal and assigning who a copy of the tense feature on T (and conversely making T agree in person and number feature with who). Subsequently (i.e. once who has acquired a tense feature by agreement with T), the edge and tense features on C (and the EPP feature on T) probe simultaneously, the former triggering movement of a copy of who to the edge of CP, and the latter triggering movement of another copy of who to the edge of TP. A further complication which then arises is the following. If agreement applies before movement, it is obviously essential that the uninterpretable tense feature assigned to who should not be deleted before movement applies, or else C will not be able to ‘see’ that who is a tensed goal; one way round this problem is to follow Chomsky in supposing that features are only deleted at the end of a phase, as an integral part of the Transfer operation by which the domain of the phase head is transferred to the semantic component. A third complication is that the analysis outlined here raises the question of why the tense feature on C in (69) doesn’t attract the tense affix in T rather than the tensed pronoun who in VP, since the affix in T would seem to be closer to C than who, and the Attract Closest Principle/ACP tells a probe to attract the closest goal. Perhaps the answer is that movement of who to spec-CP involves a different kind of movement operation (viz. an operation attracting a maximal projection into a specifier position) from movement of an affix from T to C (which involves an operation attracting a head into another head position). Perhaps ACP simply tells us that an operation attracting a head must must target the closest head which is a suitable goal (for economy reasons), and that an operation attracting a maximal projection must target the closest maximal projection which is a suitable goal (for parallel economy reasons) – but without prescribing that one type of operation is intrinsically more economical than the other. At any rate, ACP is ultimately an economy condition, and it may be that ‘prefer one movement to two’ is a more powerful economy constraint than ‘prefer a shorter to a longer movement’.

The derivation of (68b) Who killed the president? is similar in key respects. The verb kill merges with the DP the president to form the VP kill the president. This VP is then merged with a null light-verb (which attracts the verb kill) to form a v-bar which is itself merged with the pronoun who to form a VP. This vP is then merged with a T constituent containing a past tense affix (= Af), so forming a TP. The resulting TP is merged with an interrogative C, forming a CP. The agreement features on T probe, and they pick out who as their goal, agreement between the two resulting in T being marked as third person singular, and in who being marked as tensed. The movement features on the two heads (viz. the edge and tense features on C, and the EPP feature on T) then probe simultaneously (i.e. in parallel), each attracting a copy of who to move into its own specifier position – as shown by the arrows below:
As before, only the highest copy of who (= the one in spec-C) is overtly spelled out in the PF component. Since there is no T-to-C movement in subject questions, the past-tense affix in T lowers onto v via Affix Hopping, with the result that the verb KILL is ultimately spelled out as the past tense form killed, so deriving (68b) *Who killed the president?*

A key assumption made in the analysis of subject questions in (67) and (68) above is that it results in a structure in which there is one copy of who in spec-T and a separate copy of who in spec-C. The assumption that there is a copy of who in spec-T gains empirical support from sentences like:

(73)(a) *Who might appear to himself to have been victimised?*
(b) *Who is considered by himself to be the best candidate?*

We noted in §2.6 that a reflexive anaphor like *himself* can only be bound by (i.e. refer to) a c-commanding expression within the minimal TP containing the reflexive. If the only movement which who undergoes in (73) is A-bar movement from complement position in VP into specifier position within TP (as shown by the arrow below), (73a) will have the following skeletal structure:

(74) \[ CP \[ \text{Who} \[ C \emptyset \[ TP \[ T \text{might} \] appear to himself \[ TP \[ T \text{to} \] have been victimised \text{who} \] ] ] ]

But since *himself* has no antecedent c-commanding it within the bold-printed (enlarged) bracketed TP immediately containing it, such a derivation wrongly predicts that (73a) is ungrammatical. By contrast, if who undergoes successive cyclic A-movement to both spec-T positions and undergoes separate A-bar movement to spec-C, we derive the structure shown in skeletal form below (with the higher arrows showing A-movement, and the lower arrow showing A-bar movement):

(75) \[ CP \[ \text{Who} \[ C \emptyset \[ TP \[ who \[ T \text{might} \] appear to himself \[ TP \[ who \[ T \text{to} \] have been victimised \text{who} \] ] ] ] ]

Given the analysis in (75), the copy of who which occupies the specifier position within the bold-printed (enlarged) TP can serve as the antecedent of *himself*, thereby accounting for the well-formedness of (73a). Accordingly, sentences like those in (73) provide us with evidence that a copy of the subject moves to spec-T in subject questions.

But what evidence is there that a separate copy of the subject moves to spec-C? Relevant evidence comes from the observation made by Pesetsky and Torrego (2001) that who in subject questions can be substituted by *who on earth* or *who the hell*: cf.

(76)(a) *Who on earth killed the president?*        (b) *Who the hell killed the president?*
As Pesetsky (1987) notes (and as the examples in (77) below illustrate), wh-expressions like who on earth and who the hell have the property that they cannot remain in situ, but rather must move to spec-C:

(77) (a) Who on earth/Who the hell is she going out with?
(b) *She is going out with who on earth/who the hell?

If wh-expressions like those italicised in (77) always move to spec-C, it follows that the italicised subjects in (76) must likewise have moved to spec-C – and hence it is plausible to suppose that the same is true of the subject who in (68b) Who killed the president? Thus, we have empirical evidence that in subject questions, one copy of the interrogative subject moves to spec-T and a separate copy moves to spec-C.

9.9 More on subextraction

Given that (as we earlier saw in relation to the ungrammaticality of (48a) *Of which car has the driver caused a scandal?) subextraction out of the nominative subject of a transitive clause is not permitted, it is interesting to note that raising sentences such as (75) below are grammatical:

(78) Of which car would the driver appear to have caused a scandal?

In order to try and understand what’s going on here, let’s take a closer look at the derivation of (78). The DP the driver of which car originates as the specifier of the vP which is eventually spelled out as caused a scandal, and (via successive-cyclic A-movement) becomes first the specifier of infinitival to and then the specifier of would, so creating 3 copies of the DP in question. At some stage of derivation, the PP of which car must be extracted out of one of the three (italicised) copies of the DP, and be moved to the (bold-printed) spec-C position in the schematic structure (79) below:

(79) [CP Of which car [C would] [TP the driver of which car3 [T would] appear
[TP the driver of which car2 [T to] have [vP the driver of which car1 [, caused] a scandal]]]]

The grammaticality of sentence (78) leads to the conclusion that it must be possible to subextract the PP of which car out of one of the three italicised copies of the DP the driver of which car in (76). But which one?

It seems clear that the relevant PP cannot be subextracted out of the lowest copy of the italicised DP (carrying the subscript number 1) in (79), because this would violate the Specifier Condition (50) which bars subextraction out of the specifier of a phase head. Nor can the PP in question be subextracted out of the highest copy of the italicised DP (carrying the subscript number 3), because this would violate the Invisibility Condition (47) which renders the specifier of a non-defective (e.g. finite) TP invisible to a higher probe. The conclusion we reach is thus that the PP must be subextracted from the intermediate copy of the italicised DP (carrying the subscript number 2), in the manner shown by the arrow below:

(80) [CP Of which car [C would] [TP the driver of which car3 [T would] appear
[TP the driver of which car2 [T to] have [vP the driver of which car1 [, caused] a scandal]]]]

The arrowed movement in (80) does not violate the Invisibility Condition (47), because subextraction is out of the subject of a defective clause (i.e. a TP which is not the immediate complement of a C head). Nor does the arrowed movement violate the Specifier Condition (50), because the PP is not extracted out of the specifier of a phase head.

A closer look at the derivation of (80) is also revealing in respect of what it tells us about how T and C probe. First, the (non-phasal/defective) T constituent containing infinitival to attracts the DP the driver of which car to become its specifier. Then the higher (non-defective) T constituent containing would and the interrogative C constituent probe in parallel, T attracting a copy of the driver of which car to move to spec-T, and C simultaneously attracting the interrogative PP of which car to move to spec-C (the possibility of moving the whole DP to become the specifier of T-would and from there moving the wh-PP to spec-C being ruled out by the Invisibility Condition). As noted earlier, Chomsky (2005b, p.1) concludes from this kind of structure that C and T can probe either sequentially (‘in either order’ – i.e. with C probing before T, or T probing before C) or simultaneously, ‘with only certain choices converging’ (i.e.
resulting in grammaticality).

Our discussion here leads us to the wider conclusion that subextraction is possible from the subject of a defective clause (i.e. one which is a TP but not a CP), but not from the subject of a complete clause (i.e. one which is a CP). If this is so, we should expect to find that subextraction is also possible from the subject of a defective ECM clause with an accusative subject. In this connection, consider the following contrast:

(81)(a) Of which car hadn’t they expected [the driver to enter the race]?

(b) *Of which car hadn’t it been expected [for the driver to enter the race]?

In the case of (81a), the DP the driver of which car originates in spec-vP and is subsequently raised to spec-T via A-movement, as shown by the arrow in the simplified structure below:

\[
\begin{array}{c}
\text{TP} \quad \text{the driver of which car} \quad [\text{T to}] \quad [\text{vP} \quad \text{the driver of which car} \quad [\text{v enter} \quad \text{the race}]]
\end{array}
\]

The TP in (82) is then merged as the complement of the ECM verb expect, forming the VP below:

\[
\begin{array}{c}
\text{VP} \quad \text{[v expect]} \quad \text{TP} \quad \text{the driver of which car} \quad [\text{T to}] \quad [\text{vP} \quad \text{the driver of which car} \quad [\text{v enter} \quad \text{the race}]]
\end{array}
\]

This VP is in turn merged as the complement of a null light verb with an AGENT subject, forming the vP phase shown below:

\[
\begin{array}{c}
\text{vP} \quad \text{[vø]} \quad \text{[VP} \quad \text{[V expect]} \quad \text{TP} \quad \text{the driver of which car} \quad [\text{T to}] \quad [\text{vP} \quad \text{the driver of which car} \quad [\text{v enter} \quad \text{the race}]]\text{]}\text{]}\text{]}
\end{array}
\]

Chomsky (2005b) posits that just as a CP phase contains a higher probe (= C) which can trigger A-bar movement and a lower probe (= T) which can trigger A-movement (to spec-T) of a DP which it agrees with and case-marks, so too a vP phase has a parallel structure. Consequently a vP phase contains both a higher probe (the light verb v) which can trigger A-bar movement, and a lower probe (= the lexical verb V) which can trigger A-movement (to spec-V) of a DP that it agrees with and case-marks. If we further suppose that the twin heads of a phase (C and T in the case of a CP phase; v and V in the case of a vP phase) can probe in parallel, what this allows for is the following possibility. In (84), the transitive V expect agrees (invisibly) with, assigns accusative case to and triggers A-movement to spec-V of a copy of the DP the driver of which car (as shown by the dotted lower arrow below); simultaneously, the null light-verb ø triggers A-bar movement to spec-vP of a copy of the wh-PP of which car (as shown by the slashed upper arrow):

\[
\begin{array}{c}
\text{vP} \quad \text{of which car} \quad \text{they} \quad [\text{vø]} \quad [\text{VP} \quad \text{[v expect]} \quad \text{TP} \quad \text{the driver of which car} \quad [\text{T to}] \quad [\text{vP} \quad \text{the driver of which car} \quad [\text{v enter} \quad \text{the race}]]\text{]}\text{]}\text{]}
\end{array}
\]

(Note in passing that the Invisibility Condition would prevent the wh-PP of which car moving to spec-v from spec-V.) On the subsequent CP phase, the pronoun they will move to spec-T and the wh-PP of which car to spec-C, thereby deriving the structure associated with (81a) Of which car hadn’t they expected the driver to enter the race?

Our discussion of (81a) above illustrates that subextraction is possible from the accusative subject of a defective clause (i.e. a clause which is a TP but not a CP). But why, then, should subextraction be barred out of the accusative subject in (81b) *Of which car hadn’t it been expected [for the driver to enter the race]? The answer is that the bracketed clause containing the accusative subject in this case is a complete clause (i.e. one which is both a CP and a TP), and hence a phase. Given that CPs are phases, the only way in which the wh-PP of which car can move into spec-C in the main clause is by first moving into spec-C in the complement clause. On the assumptions made here, the complement clause will have the structure shown in simplified form below:

\[
\begin{array}{c}
\text{CP of which car} \quad [\text{C for}] \quad [\text{TP} \quad \text{the driver of which car} \quad [\text{T to}] \quad [\text{vP} \quad \text{the driver of which car} \quad [\text{v enter} \quad \text{the race}]]\text{]}
\end{array}
\]
However, the problem posed by this structure is that subextraction of the bold-printed wh-PP from copy 1 of the italicised DP *the driver of which car* violates the Specifier Condition (50) which bars subextraction out of the specifier of a phase head (the phase head in this case being a light verb with an italicised external argument); moreover, subextraction of the wh-PP out of copy 2 is blocked by the Invisibility Condition (47) which renders invisible the specifier of a non-defective TP (i.e. a TP which is the complement of a phasal C head). Since there is no way for the wh-PP of which car to move to spec-C, the associated sentence (81b) *Of which car hadn’t it been expected for the driver to enter the race?* is ungrammatical.

Our discussion of subextraction from accusative subjects in this section leads us to the more general conclusion that subextraction is possible from the subject of a defective clause (= TP), but not from the subject of a complete clause (= CP).

### 9.10 Summary

In this chapter, we have taken a look at Chomsky’s phase-based theory of syntax. In §9.2, we noted Chomsky’s claim that the computational component of the Language Faculty can only hold limited amounts of syntactic structure in its working memory at any one time, and that clause structure is built up in **phases** (with phases including CP and transitive vP). At the end of each phase, the **domain** (i.e. complement of the phase head) undergoes transfer to the phonological and semantic components, with the result that neither the domain nor any constituent it contains are accessible to further syntactic operations from that point on. In §9.3 we saw that intransitive vPs and defective clauses (i.e. clauses which are TPs but not CPs) are not phases, and hence allow A-movement out of their complement, as in structures such as *Several problems are thought to remain in Utopia.* In §9.4 we saw that a phase-based theory of syntax requires us to assume that long-distance A-bar movement (e.g. of wh-expressions) involves movement through intermediate spec-CP positions, since CP is a phase and only constituents at the **edge** of a phase can undergo subsequent syntactic operations. In §9.5 we saw that a phase-based theory likewise requires us to posit that A-bar movement in transitive clauses involves movement through intermediate spec-vP positions – and we noted that there is empirical evidence in support of this assumption from wh-marking of verbs in Chamorro, past participle agreement in French, and mutation in Welsh. In §9.6, we saw that in recent work, Chomsky has suggested that phase heads (like C and a transitive v with a thematic external argument) enter the derivation carrying both interpretable and uninterpretable features, whereas other heads enter the derivation carrying only interpretable features. Because an uninterpretable feature on a phase head (once valued) will wrongly be ‘seen’ by the grammar as interpretable, all uninterpretable features on a phase head must be handed over to a subordinate head: thus, C hands over its uninterpretable agreement features to T, and transitive v hands over its uninterpretable agreement features to V. In §9.7, we outlined the proposal in Chomsky (2005b) that different heads (like C and T) within the same phase probe independently (either simultaneously or sequentially) once a phasal structure like CP has been formed. We saw that this allows us to account for why subextraction is barred in an active sentence such as *Of which car has the driver caused a scandal?* but not in a passive such as *Of which car was the driver arrested?* In §9.7, we went on to show that this analysis implies that subject questions like *Who was arrested?* involve A-movement of one copy of who from V-complement position into spec-T, and simultaneous A-bar movement of a separate copy of who from V-complement position into spec-C. In §9.8 we saw that subextraction is possible from the specifier position in a defective clause – hence from the subject of an infinitival TP which is the complement of a raising, passive, or ECM predicate.

Some of the key assumptions made in this chapter are repeated below:

1. **Transfer**
   - (i) At the end of each phase, the domain (i.e. complement of the phase head) undergoes *transfer*
   - (ii) At the end of the overall derivation, all remaining constituents undergo transfer

2. **Inactivation Condition**
   A case-marked goal becomes inactive for agreement with (or attraction by) an A-head like T once its case feature has been valued and deleted

3. **Mixed Chains Constraint**
   Movement cannot give rise to a mixed chain containing one copy of a constituent which has moved to the edge of a phase, and another which has moved to the edge of a non-phasal projection
(47) **Invisibility Condition**  
The specifier of a complete (non-defective) TP is invisible to any higher probe

(50) **Specifier Condition**  
No subextraction is possible out of a constituent which is a specifier of a phase head

(63) **Visibility Condition**  
Only the highest copy in a movement chain is visible in the syntax (other copies being inert)

(64) **Intervention Condition**  
Probe P cannot target goal G if there is some other visible goal of the same kind as G intervening between the two and if the intervening goal is inactive

**WORKBOOK SECTION**

**Exercise 9.1**  
Discuss the role played by phases in the derivation of the following sentences:

1. Where did he arrange for her to go?
2. Where does she think they’ve gone?
3. Who knows what she will say?
4. What does it appear that he thinks was said to her?
5. What is he thought to want her to do?
6. How many prizes seem to have been awarded?
7. How many prizes do there seem to have been awarded?
8. What kind of prize do you want to award?

**Helpful hints**  
In 6 and 7 take *how many prizes* to be a QP, with *many* as its head, *prizes* as its complement, and *how* as its specifier. Recall the discussion of infinitive complements in §§4.7-4.8, and pied-piping in §§6.6-6.7.

**Model answer for 1**  
The unaccusative verb *go* merges with its (locative adverbial pronoun) complement *where* to form the V-bar *go where*. This V-bar is then merged with the pronoun (which is ultimately spelled out as) *her* to form the VP *her go where*. The resulting VP is in turn merged with a null intransitive light-verb, forming the vP *ø her go where*. Since the light verb has no external argument, it is not a phase head and so has no edge feature and cannot trigger wh-movement. The resulting vP merges with infinitival *to*, forming a TP which is in turn merged with the complementiser *for* to form the CP shown below:

(i)  
```
CP
  C
  for
  T
  to
  vP
    v
      φ
      PRN
      her
    V'
      V
      ADV
      go
      where
```  

If all structural case assignment involves agreement between a probe and a goal, and if uninterpretable features originate on phase heads, then the complementiser *for* will enter the derivation carrying a set of unvalued (and uninterpretable) person and number agreement features, and these will percolate down from C onto T. At this point, C, T and v probe independently. The light verb v attracts V-go to adjoin to it.
Since T has inherited a set of person/number agreement features from C, T will agree with and case-mark the active pronoun *her*, and (by virtue of its EPP feature) will attract *her* to move to spec-TP. Since CP is a phase, C will carry an edge feature triggering movement of *where* to spec-C, so deriving the structure shown in simplified form below:

(ii)

```
CP
  /\ADV/where
   /\C'
     /\C
       /TP
         /\PRN/for
           /T'
             /\vP
               /\v
                 /\to
                   /\PRN/her
                     /\V
                       /\ADV
                         /go
                           /where
```

At the end of the C-cycle, the domain of C (i.e. its TP complement) will undergo transfer (to the phonological and semantic components) and thereafter be inaccessible to further syntactic operations; italicised trace copies of moved constituents will be deleted.

The resulting CP is then merged with the verb *arrange*, forming the VP *arrange where for her to go*. This is in turn merged with a light-verb, forming the v-bar *Ø arrange where for her to go*. The resulting v-bar is merged with its AGENT external argument *he* (the AGENT role of *he* being shown by the possibility of modifying it by the agitative adverb *deliberately*). Since the light verb is transitive by virtue of having an external argument, vP is a phase, and so the light-verb probes at this point. By virtue of being strong/affixal, the light-verb attracts the verb *arrange* to adjoin to it. By virtue of being a phase head, the light verb also has an edge feature triggering movement of *where* to spec-vP, so deriving the structure shown below (simplified by not showing the structure of the embedded CP or the null constituents which it contains):

(iii)

```
vP
  /\ADV/where
   /\v'
     /\PRN/he
       /\v'
         /\v
           /\Ø+arrange
              /\VP
                /\CP
```

At the end of the vP phase, the VP domain will undergo transfer, and the italicised trace copy of the verb *arrange* will have a null spellout in the PF component.

The vP in (iii) is then merged as the complement of a finite T constituent containing a past tense affix, and the resulting TP is then merged with an interrogative C to form the CP phase in (iv) below (simplified by showing only overt constituents of vP):
The phase head C carries a set of (unvalued and uninterpretable person/number) agreement features which percolate down onto T. C and T then probe independently. By virtue of being a phase head, C has an edge feature which triggers movement of the interrogative goal where to spec-C. C also has a tense feature which triggers movement of the affix Af from T to C. The past-tense affix in T agrees with and case-marks the pronoun he, attracting it to move to spec-T. If where counts as a potential intervener blocking T from targeting where in (iv) (which will arguably not be so if where is an adverb which does not carry a case feature), movement of where to spec-C will have to take place before movement of he to spec-T. At any rate, the result of these three different movement operations is to derive the structure shown below (simplified by showing only overt constituents of vP):

![Diagram](image)

The TP domain undergoes transfer in accordance with (7i) in the main text (with the italicised copy of the affix in T receiving a null spellout). The copy of the affix stranded in C undergoes DO-support in the PF component, with DO ultimately being spelled out as did because it is attached to a past tense affix.

The constituents on the edge of CP undergo transfer in accordance with (7ii) in the main text.

An issue glossed over in the above discussion is what determines the case assigned by a probe to a goal with which it agrees in person and number. The question can be phrased in simple terms thus: Why does the main-clause T assign nominative case to the goal it agrees with, and the complement-clause T assign accusative case to its goal? A plausible assumption would be that this correlates with the interpretable features of T: e.g. T carrying a finite tense feature assigns nominative case to its goal, whereas a T carrying a non-finite tense feature assigns accusative case to its goal. However, things can’t be that simple, as we see by looking at a control infinitive clause like that italicised in:

![Diagram](image)

If the null C heading the phase enters the derivation carrying agreement features which it hands down to T, T will then agree with and case-mark the PRO subject of vP. But since T is infinitival here, the question which arises is why T-to assigns null case to PRO in (vi), when T-to in (ii) assigned accusative case to her. Does this reflect some difference in the interpretable features carried by to in control infinitives and to
in for-to infinitives? (See Stowell 1982 for a discussion of the interpretive properties of infinitival to.) If not, could it be that (in addition to agreement features) a phase head like C carries an uninterpretable case feature which is ‘handed down’ to T, and then serves to value the case feature on the relevant goal? We could then say that a finite C like that carries an uninterpretable nominative case feature which percolates down onto T and assigns nominative case to a goal that T agrees with; the infinitival complementiser for carries an accusative case feature; and the null infinitival complementiser in control clauses carries a null case feature. As should be obvious, the precise answer to these questions is far from clear.

Exercise 9.2
Discuss the syntax of subextraction in the sentences below:

1 Of which drugs did they find traces?
2 Of which drugs were traces found?
3 Of which drugs were there found traces?
4 Of which drugs did traces remain in the blood?
5 Of which drugs did there remain traces in the blood?
6 *Of which drugs did traces contaminate the blood?
7 Of which drugs do you think they found traces?
8 *Of which drugs do you wonder what traces they found?
9 Of which drugs are traces believed to have contaminated the blood?
10 Of which drugs do they believe traces to have contaminated the blood?
11 *Of which drugs do they believe traces contaminated the blood?
12 Of which drugs do they believe traces were found in the blood?
13 *Of which drugs would it be unlikely for traces to contaminate the blood?
14 Of which drugs would it be unlikely for traces to be found in the blood?

Model answer for 1
The verb find merges with the QP ø traces of which drugs (with ø being a null partitive quantifier) to form the VP find ø traces of which drugs. The resulting VP then merges with a light verb to form a v-bar which in turn merges with its AGENT external argument they to form an even larger v-projection, with the verb find raising from V to v. By virtue of having an external argument, the light verb will carry agreement features which percolate from v to V, allowing V to agree with and assign accusative case to its QP complement ø traces of which drugs. Since a light verb with an external argument is also a phase head and so has an edge feature, the light verb attracts the wh-PP of which drugs to move to spec-v in the manner shown by the arrow below:

(i)                                      vP
PP                                         v'
  of which drugs
      PRN they
      v
      v'
      v
      V
      VP
      find+ø
      V
      QP
      find
      ø traces
      of which drugs

There is no violation of any extraction constraint because the QP is subexacted out of a complement, not out of an adjunct or specifier. The VP complement of the phase head undergoes spellout at this point, in accordance with (7i) in the main text.

The vP in then merges with a T constituent containing a past tense affix, forming a TP which in turn merges with an interrogative C to form the CP below (simplified by showing only overt constituents of vP):
C enters the derivation carrying agreement features, and hands these over to T. C and T then probe independently. T agrees with and assigns nominative case to the pronoun *they* and attracts it to move to spec-T (there being no intervention effect because the intervening PP of which drugs is not the kind of constituent which serves as a potential goal for agreement with T, since such a goal can only be a constituent whose head carries an initially unvalued case feature, and the head P of PP is not such a constituent). The edge feature on C attracts the interrogative PP of which drugs to move to spec-C, and the tense feature on C attracts the affix in T to move to C, so deriving the structure shown below (again simplified by showing only overt constituents of vP):

The TP domain undergoes transfer in accordance with (7i) in the main text (with the italicised copy of the affix in T receiving a null spellout). The copy of the affix in C undergoes DO-support in the PF component, with DO being ultimately being spelled out as *did* because it is attached to a past tense affix. The constituents on the edge of CP undergo Transfer in accordance with (7ii) in the main text.
Glossary and List of Abbreviations

Bold print is used to indicate technical terms, and to cross-refer to entries elsewhere in the glossary. Abbreviations used here are: ch. = chapter; § = chapter/section number; ex. = exercise.


A-bar: An A-bar position is a position which can be occupied by arguments or adjuncts alike. For example, the specifier position within CP is said to be an A-bar position because it can contain not only an argument like the italicised wh-phrase in ‘Which car did he fix?’ but also an adjunct like the italicised adverbial phrase in ‘How did he fix the car?’ A-bar movement is a movement operation (like wh-movement) which moves an argument or adjunct expression to an A-bar position. On A-bar head, see A-head.

Acc(usative): See Case.

ACP: See Attract Closest Principle.

Acquisition: The process by which people acquire their first language (= L1 acquisition) or a second language which is not their mother tongue (= L2 acquisition).

Active: A contrast is traditionally drawn between sentence pairs such as (i) and (ii) below:

(i) The thieves stole the jewels
(ii) The jewels were stolen by the thieves

(i) is said to be an active clause (or sentence), and (ii) to be its passive counterpart; similarly, the verb stole is said to be an active verb (or a verb in the active voice) in (i), whereas the verb stolen is said to be a passive verb (or a verb in the passive voice - more specifically, a passive participle) in (ii); likewise, the auxiliary were in (ii) is said to be a passive auxiliary. In a different use, a probe or goal is said to be active for movement/agreement if it carries an (unvalued) uninterpretable feature: see §7.4.

Adequacy, criteria of: These are the criteria which an adequate grammar or linguistic theory must meet. See §1.3.

Adjacency condition: A condition requiring that two expressions must be immediately adjacent (i.e. there must be no constituent intervening between the two) in order for some operation to apply. For example, have must be immediately adjacent to they in order to cliticise onto it in structures such as They’ve gone home.

Adjective: This is a category of word (abbreviated to A) which often denotes states (e.g. happy, sad), which typically has an adverb counterpart in -ly (cf. sad/sadly), which typically has comparative/superlative forms in -er/-est (cf. sadder/saddest), which can often take the prefix un- (cf. unhappy), which can often form a noun by the addition of the suffix -ness (cf. sadness), etc.

Adjoin: See Adjunction.

Adjunct: One way in which this term is used is to denote an optional constituent typically used to specify e.g. the time, place or manner in which an event takes place. Another way in which it is used is to denote a constituent which has been attached to another to form a larger constituent of the same type. (See Adjunction).

Adjunction: This is a process by which one constituent is adjoined (= attached) to another to form a larger constituent of the same type. For example, we could say that in a sentence like ‘He should not go’, the negative particle not (in the guise of its contracted form n’t) can be adjoined to the auxiliary should to form the negative auxiliary shouldn’t. In a sentence such as He gently rolled the ball down the hill, the adverb gently can be taken to be an adverb which adjoins to a verbal projection, extending it into a larger projection of the same kind: see §8.3.

Adposition: A cover term subsuming preposition and postposition. For example, the English word in is a preposition since it is positioned before its complement (cf. in Tokyo), whereas its Japanese counterpart is a postposition because it is positioned after its complement Tokyo. Both words are adpositions.
ADV/Adverb: This is a category of word which typically indicates manner (e.g. ‘wait patiently’) or degree (e.g. ‘exceedingly patient’). In English, most (but not all) adverbs end in -ly (cf. quickly - but also almost).

Af: See Affix

Affective: An affective constituent is an (e.g. negative, interrogative or conditional) expression which can have a polarity expression like (partitive) any in its scope. So, for example, interrogative if is an affective constituent as we see from the fact that an interrogative if-clause can contain partitive any in a sentence such as ‘I wonder if he has any news about Jim.’ See ex.2.2.

Affix/Affixal: The term affix is typically used to describe a grammatical morpheme which cannot stand on its own as an independent word, but which must be attached to a host word of an appropriate kind. An affix which attaches to the beginning of a word (e.g. un- in unhappy) is called a prefix: an affix which attaches to the end of a word (e.g. -s in chases) is called a suffix. An affixal head is one which behaves like an affix in needing to attach to a particular kind of host word. See also Clitic. Affix Hopping is an operation by which an unattached affix in T is lowered onto a verb: see §3.4. Affix Attachment is an operation whereby an unattached tense affix lowers onto a verb where possible, but is otherwise supported by use of the dummy auxiliary do: see §4.8.

AGENT: This is a term used to describe the semantic (= thematic) role which a particular type of argument plays in a given sentence. It typically denotes a person who deliberately causes some state of affairs to come about: hence e.g. John plays the thematic role of AGENT in a sentence such as ‘John smashed the bottle’. See §6.4.

Agreement: An operation by which (e.g. in a sentence like They are lying) the person/number features of the auxiliary are get assigned the same values as those of its subject they, so that are is third person plural because it agrees in person and number with its third person plural subject they. See ch.7.

A-head: An A-head is the kind of head (like T) which allows as its specifier an argument expression but not an adjunct expression. An A-bar head is the kind of head (like C) which allows as its specifier either an argument or an adjunct expression.

Allomorphs: Variant phonetic forms of a single morpheme. For example, the noun plural morpheme {s} in English has the three allomorphs /s/ (e.g. in cats) /z/ (e.g. in dogs) and /lz/ (e.g. in horses).

A-movement: Movement from one A position to another (typically, from a subject or complement position into another subject position). See ch.6.

A-position: A position which can be occupied by an argument, but not by a nonargument expression (e.g. not by an adjunct). In practice, the term denotes a subject position, or a lexical complement position (i.e. a position occupied by a constituent which is the complement of a lexical/substantive head).

Anaphor: This is an expression (like himself) which cannot have independent reference, but which must take its reference from an appropriate antecedent (i.e. expression which it refers to) within the same phrase or sentence. Hence, while we can say ‘John is deluding himself’ (where himself refers back to John), we cannot say ‘Himself is waiting’, since the anaphor himself here has no antecedent. A traditional distinction is drawn between reflexive anaphors (i.e. self forms like myself/ourselves/yourselves/himself/herself/itself/themselves) and the reciprocal anaphors each other/one another (cf. ‘They help each other/one another’). See §2.6 and ex.2.2.

Animate: The term animate is used to denote (the gender of) an expression which denotes a living being (e.g. a human being or animal), while the term inanimate is used in relation to an expression which denotes lifeless entities. For example, the relative pronoun who could be said to be animate in gender and the relative pronoun which inanimate – hence we say someone who upsets people and something which upsets people.

Antecedent: An expression which is referred to by a pronoun or anaphor of some kind. For example, in ‘John cut himself shaving’, John is the antecedent of the anaphor himself, since himself refers back to John. In a sentence such as ‘He is someone who we respect’, the antecedent of the relative pronoun who is someone.
AP: **adjectival phrase** – i.e. a phrase headed by an adjective, such as *fond of chocolate, keen on sport, good at syntax*, etc.

**Arbitrary**: When we say that an expression has ‘arbitrary reference’, we mean that it can denote an unspecified set of individuals, and hence have much the same meaning as English *one/people* or French *on*.* In a sentence such as ‘It is difficult [PRO to learn Japanese]’, the bracketed clause is said to have an abstract pronoun subject PRO which can have arbitrary reference, in which case the sentence is paraphrasable as ‘It’s difficult for *people* to learn Japanese.’ See §3.2.

**Argument**: This is a term borrowed by linguists from philosophy (more specifically, from predicate calculus) to describe the role played by particular types of expression in the semantic structure of sentences. In a sentence such as ‘John hit Fred’, the overall sentence is said to be a **proposition** (a term used to describe the semantic content of a clause), and to consist of the predicate *hit* and its two arguments *John* and *Fred*. The two arguments represent the two participants in the act of hitting, and the predicate is the expression (in this case the verb *hit*) which describes the activity in which they are engaged. By extension, in a sentence such as ‘John says he hates syntax’ the predicate in the main clause is the verb *says*, and its two arguments are *John* and the clause *he hates syntax*; the argument *he hates syntax* is in turn a proposition whose predicate is *hates*, and whose two arguments are *he* and *syntax*. Since the complement of a verb is positioned internally within V-bar whereas the subject of a verb is positioned outside V-bar, complements are also referred to as **internal arguments**, and subjects as **external arguments**. Expressions which do not function as arguments are **nonarguments**. The **argument structure** of a predicate provides a description of the set of **arguments** associated with the **predicate**, and the **thematic role** which each fulfils in relation to the predicate. See 6.4.

**Array**: The **lexical array** for a given expression denotes the set of lexical items out of which the expression is formed.

**Article**: A term used in traditional grammar to describe a particular subclass of determiners: the determiner *the* is traditionally called the **definite article**, and the determiner *a* the **indefinite article**.

**Aspect**: A term typically used to denote the duration of the activity described by a verb (e.g. whether the activity is ongoing or completed). In sentences such as:

(i) He has taken the medicine  (ii) He is taking the medicine

the auxiliary *has* is said to be an auxiliary which marks **perfect aspect**, in that it marks the perfection (in the sense of ‘completion’ or ‘termination’) of the activity of taking the medicine; for analogous reasons, *taken* is said to be a **perfect participle** verb form in (i) (though is referred to in traditional grammars as a ‘past participle’). Similarly, *is* functions as an auxiliary which marks **progressive aspect** in (ii), because it relates to an activity which is ongoing or in progress (for this reason, *is* in (ii) is also referred to as a **progressive auxiliary**); in the same way, the verb *taking* in (ii) is said to be the **progressive participle** form of the verb (though is sometimes known in traditional grammars as a ‘present participle’).

**Aspectual auxiliaries**: Auxiliaries which mark **Aspect** - e.g. perfect *have* and progressive *be*. See **Aspect**.

**Associate**: An expression which represents the thematic argument in an expletive *there* construction, and which is associated with the expletive subject *there*: e.g. **several prizes** in *There were awarded several prizes*.

**Asymmetric c-command**: See **C-command**.

**Attract**: To say that a head H **attracts** a constituent C is to say that H triggers movement of C to some position on the edge of HP (so that C may move to adjoin to H, or to become the specifier of H).

**Attract Closest Principle**: A principle of grammar requiring that a head H which **attracts** a particular type of constituent C attracts the closest C which it c-commands.

**Attribute**: See **Value**.

**Attributive adjective**: This term denotes an adjective which is used to modify a following noun expression - e.g. *red* in ‘John has a *red* Ferrari’, where *red* attributes the property of being red to the noun *Ferrari*. Attributive adjectives contrast with **predicative adjectives**, which are adjectives used in
structures such as ‘The house was red’ or ‘They painted the house red’, (where the property of being red is said to be **predicated** of the expression *the house*).

**AUX/Auxiliary:** A term used to **categorise** items such as will/would/can/could/shall/should/may/might/must/ought and some uses of have/be/do/need/dare. Such items have a number of idiosyncratic properties, including the fact that they can undergo **inversion** (e.g. in questions like ‘Can you speak French?’). By contrast, **main verbs** (i.e. verbs which are not auxiliaries) cannot undergo inversion – as we see from the ungrammaticality *‘Speak you French?’*  

**AUXP:** Auxiliary projection/Auxiliary phrase – i.e. a phrase headed by an auxiliary which does not occupy the head T position of TP. See §4.6.

**Auxiliary copying:** A phenomenon whereby a moved auxiliary leaves behind an overt copy of itself when it moves – as with *can* in a Child English question like *What can I have for dinner?*

**Auxiliary inversion:** See Inversion.

**Auxiliary selection:** This term relates to the type of verb which a given auxiliary selects as its complement: e.g. in many languages (the counterpart of) **BE** when used as a perfect auxiliary selects only a complement headed by a verb with no **external argument**, whereas (the counterpart of) **HAVE** selects a complement headed by a verb with an external argument.

**B:** On Principle B of Binding Theory, see ex. 3.2.

**bar:** When used as a suffix attached to a category label such as N, V, P etc (as in N-bar, V-bar, P-bar, T-bar etc.), it denotes an **intermediate projection** which is larger than a word but smaller than a phrase. Hence, in a phrase such as *university policy on drugs*, we might say that the string *policy on drugs* is an N-bar, since it is a projection of the head noun *policy*, but is an intermediate projection in that it has a larger projection into the NP *university policy on drugs*. The term **bar notation** refers to a system of representing projection levels which posits that (first-) merge of a head H with its complement forms an H-bar constituent, (second-) merge of a head with a specifier forms an H-double-bar constituent, (third-) merge of a head with a further specifier forms an H-treble-bar constituent, and so on (with the **maximal projection** of H being labelled HP). On A-bar position, see A-position.

**Bare:** A **bare infinitive** structure is one which contains a verb in the infinitive form, but does not contain the infinitive particle to (e.g. the italicised clause in ‘He won’t let you help him’). A **bare noun** is a noun used without any determiner to modify it (e.g. *fish* in ‘*Fish is expensive’*). A **bare clause** is one not introduced by an overt complementiser (e.g. *he was tired* in ‘John said he was tired’). A theory of **bare phrase structure** is one in which there are no category labels or projection levels associated with constituents: see §2.7.

**Base form:** The base form of a verb is the simplest, uninflected form of the verb (the form under which the relevant verb would be listed in an English dictionary) - hence forms like go/be/have/see/want/love are the base forms of the relevant verbs. The base form can typically function either as an **infinitive** (cf. ‘Try to stay’), an **imperative** (cf. ‘Stay with me tonight!’), a present tense **indicative** form (‘They sometimes stay with me’), or a **subjunctive** form (cf. ‘I demand that he stay with me’).

**Binarity Principle:** A principle of Universal Grammar specifying that all nonterminal nodes in syntactic structures (i.e. tree-diagrams) are **binary-branching**. See §2.2.

**Binary:** A term relating to a two-way contrast. For example, **number** is a binary property in English, in that we have a two-way contrast between **singular** forms like *cat* and **plural** forms like *cats*. It is widely assumed that **parameters** have binary settings, that features have binary values, and that all branching in syntactic structure is binary.

**Binary-branching:** A tree diagram in which every nonterminal node has two daughters is binary-branching; a category/node which has two daughters is also binary-branching. See 2.2.

**Bind/Binder/Binding:** To say that one constituent X binds (or serves as the binder for) another constituent Y (and conversely that Y is bound by X) is to say that X determines properties (usually, referential properties) of Y. For example, in a sentence such as ‘John blamed himself’, the reflexive anaphor *himself* is bound by *John* in the sense that the referential properties of *himself* are determined by
John (so that the two refer to the same individual). The **C-command condition on binding** says that a bound form must be c-commanded by its antecedent. On principles A, B and C of **Binding Theory**, see ex.2.2.

**Bottom-up**: To say that a syntactic structure is derived in a bottom-up fashion is to say that the structure is built up from bottom to top, with lower parts of the structure being formed before higher parts.

**Bound**: In a traditional use of this term, a bound form is one which cannot stand alone and be used as an independent word, but rather must be attached to some other morpheme (e.g. negative *n’t*, which has to attach to some auxiliary such as *could*). In a completely different use of the term, a bound constituent is one which has a binder (i.e. antecedent) within the structure containing it (See **Bind**).

**Bracketing**: A technique for representing the categorial status of an expression, whereby the expression is enclosed within a pair of square brackets, and the lefthand bracket is labelled with an appropriate category symbol - e.g. [D the].

**Branch**: A term used to represent a solid line linking a pair of nodes in a tree diagram, marking a mother/daughter (i.e. containment) relation between them.

C: See **Complementiser**

**Canonical**: A term used to mean ‘usual’, ‘typical’ or ‘normal’, as in ‘The canonical word order in English is specifier-head+complement.’

**Case**: The different case forms of a pronoun are the different forms which the pronoun has in different sentence positions. It is traditionally said that English has three cases – **nominative** (abbreviated to **Nom**), **accusative** (= **Acc**, sometimes also referred to as **objective**), and **genitive** (= **Gen**). Personal pronouns typically inflect overtly for all three cases, whereas noun expressions inflect only for genitive case. The different case forms of typical pronouns and noun expressions are given below:

<table>
<thead>
<tr>
<th>nominative</th>
<th>I</th>
<th>we</th>
<th>you</th>
<th>he</th>
<th>she</th>
<th>it</th>
<th>they</th>
<th>who</th>
<th>the king</th>
</tr>
</thead>
<tbody>
<tr>
<td>accusative</td>
<td>me</td>
<td>us</td>
<td>you</td>
<td>him</td>
<td>her</td>
<td>it</td>
<td>them</td>
<td>whom</td>
<td>the king</td>
</tr>
<tr>
<td>genitive</td>
<td>my</td>
<td>mine</td>
<td>our</td>
<td>yours</td>
<td>his</td>
<td>hers</td>
<td>its</td>
<td>their</td>
<td>whose</td>
</tr>
</tbody>
</table>

As is apparent, some pronouns have two distinct genitive forms: a **weak** (shorter) form used when they are immediately followed by a noun (as in ‘This is *my* car’), and a **strong** (longer) form used when they are not immediately followed by a noun (as in ‘This car is *mine*’). In Chomsky and Lasnik (1995), it is suggested that the null subject PRO found in **control** constructions carries null case. In languages like English where certain types of expression are assigned case by virtue of the structural position they occupy in a given clause (e.g. accusative if c-commanded by a transitive head, nominative if c-commanded by finite intransitive head), the relevant expressions are said to receive **structural case**. Where a constituent is assigned case by virtue of its semantic function (e.g. a **GOAL** complement of certain types of verb is assigned dative case in German), it is said to receive **inherent case**. In languages like Icelandic where subjects can be assigned a variety of cases (e.g. some are accusative and others dative, depending on the choice of verb and its semantic properties), subjects are said to have **quirky case**. In the Italian counterpart of a structure like ‘She gave him them’, the **direct object** corresponding to English ‘them’ is assigned accusative case, and the indirect object corresponding to English ‘him’ is assigned a distinct case, traditionally called **dative case**. (On direct and indirect objects, see **Object**). On **nominative case assignment**, see §3.9 and §7.3; on **accusative case assignment**, see §3.9 and §7.9; on **null case assignment**, see §3.9 and §7.8; and on the syntax of **genitives**, see §5.5.

**Case particle**: Some linguists take *of* in structures like *destruction of the city* or *fond of pasta* to be a particle marking **genitive** case and belonging to the category **K** of **case particle**. On this analysis, the *of*-phrase (*of the city*) is taken to have genitive case, and *of* is said to be the morpheme which marks genitive case.

**Categorial**: Categorial information is information about the grammatical category that an item belongs to. A categorial property is one associated with members of a particular grammatical category. The **Categorial Uniformity Principle** is a principle suggested by Luigi Rizzi (2000, p.288) to the effect that
all expressions of the same type belong to the same category (e.g. all declarative clauses are CPs, both main clauses and complement clauses).

**Categorise/Categorisation**: Assign(ing) an expression to a (grammatical) category.

**Category**: A term used to denote a set of expressions which share a common set of linguistic properties. In syntax, the term is used for expressions which share a common set of grammatical properties. For example, boy and girl belong to the (grammatical) category noun because they both inflect for plural number (cf. boys/girls), and can both be used to end a sentence such as ‘The police haven’t yet found the missing ---’. In traditional grammar, the term parts of speech was used in place of categories.

**Causative verb**: A verb which has much the same sense as ‘cause’. For example, the verb have in sentences such as ‘He had them expelled’ or ‘He had them review the case’ might be said to be causative in sense (hence to be a causative verb).

**C-command**: A structural relation between two constituents. To say that one constituent X c-commands another constituent Y is (informally) to say that X is no lower than Y in the structure (i.e. either X is higher up in the structure than Y, or the two are at the same height). More formally, a constituent X c-commands its sister constituent Y and any constituent Z that is contained within Y. A constituent X asymmetrically c-commands another constituent Y if X c-commands Y but Y does not c-command X. See §2.6.

**C-command condition on binding**: A condition to the effect that a bound constituent (e.g. a reflexive anaphor like himself or the trace of a moved constituent) must be c-commanded by its antecedent (i.e. by the expression which binds it). See §2.6 and exercise 2.2.

**CED**: See Condition on Extraction Domains.

**Chain**: A set of constituents comprising an expression and any trace copies associated with it. Where a constituent does not undergo movement, it forms a single-membered chain.

**Citation**: The citation form of a word is the form under which the word is listed in traditional dictionaries.

**Clause**: A clause is defined in traditional grammar as an expression which contains (at least) a subject and a predicate, and which may contain other types of expression as well (e.g. one or more complements and/or adjuncts). In most cases, the predicate in a clause is a lexical (= main) verb, so that there will be as many different clauses in a sentence as there are different lexical verbs. For example, in a sentence such as ‘She may think that you are cheating on her’, there are two lexical verbs (think and cheating), and hence two clauses. The cheating clause is that you are cheating on her, and the think clause is She may think that you are cheating on her, so that the cheating clause is one of the constituents of the think clause. More specifically, the cheating clause is the complement of the think clause, and so is said to function as a complement clause in this type of sentence. Clauses whose predicate is not a verb (i.e. verbless clauses) are known as small clauses: hence, in ‘John considers [Mary intelligent]’, the bracketed expression is sometimes referred to as a small clause.

**Cleft sentence**: A structure such as ‘It was syntax that he hated most’, where syntax is said to occupy focus position within the cleft sentence.

**Cliticisation**: The term clitic denotes an item which is (generally) a reduced form of another word, and which has the property that (in its reduced form) it must cliticise (i.e. attach itself to) an appropriate kind of host (i.e. to another word or phrase). For example, we could say that the contracted negative particle n’t is a clitic form of the negative particle not which attaches itself to a finite auxiliary verb, so giving rise to forms like isn’t, shouldn’t, mightn’t, etc. Likewise, we could say that ’ve is a clitic form of have which attaches itself to a pronoun ending in a vowel, so giving rise to forms like we’ve, you’ve, they’ve, etc. When a clitic attaches to another word, it is said to be an enclitic (and hence to encliticise) onto the relevant word. Clitics differ from affixes in a number of ways. For example, a clitic is generally a reduced form of a full word, and has a corresponding full form (so that ’ll is the clitic form of will, for example), whereas an affix (like noun plural –s in cats) has no full-word counterpart. Moreover, clitics can attach to phrases (e.g., ’s can attach to the president in The president’s lying), whereas an affix typically attaches to a word stem (e.g. the past tense -ed affix attaches to the verb stem snow in snowed).
Close/Closer/Closest: In structures in which a head X attracts a particular kind of constituent Y to move to the edge of XP, X is said to attract the closest constituent of type Y, in accordance with the Attract Closest Principle. See also Local.

Cognition/Cognitive: (Relating to) the study of human knowledge.

Common Noun: See Noun.

COMP: See Complementiser.

Comparative: The comparative form of an adjective or adverb is the form (typically ending in –er) used when comparing two individuals or properties: cf. ‘John is taller than Mary’, where taller is the comparative form of the adjective tall.

Competence: A term used to represent native speakers’ knowledge of the grammar of their native language(s).

Complement: This is a term used to denote a specific grammatical function (in the same way that the term subject denotes a specific grammatical function). A complement is an expression which is directly merged with (and hence is the sister of) a head word, thereby projecting the head into a larger structure of essentially the same kind. In ‘Close the door’, the door is the complement of the verb close; in ‘After dinner’, dinner is the complement of the preposition after; in ‘good at physics’, at physics is the complement of the adjective good; in ‘loss of face’, of face is the complement of the noun loss. As these examples illustrate, complements typically follow their heads in English. The choice of complement (and the morphological form of the complement) is determined by properties of the head: for example, an auxiliary such as will requires as its complement an expression headed by a verb in the infinitive form (cf. ‘He will go/*going/*gone’). Moreover, complements bear a close semantic relation to their heads (e.g. in ‘Kill him’, him is the complement of the verb kill and plays the semantic role of THEME argument of the verb kill). Thus, a complement has a close morphological, syntactic and semantic relation to its head. A complement clause is a clause which is used as the complement of some other word (typically as the complement of a verb, adjective or noun). Thus, in a sentence such as ‘He never expected that she would come’, the clause that she would come serves as the complement of the verb expected, and so is a complement clause. On complement selection, see Selection.

Complementiser: This term is used in two ways. On the one hand, it denotes a particular category of clause-introducing word such as that/if/for, as used in sentences such as ‘I think that you should apologize’, ‘I doubt if she realises’, ‘They’re keen for you to show up’. On the other hand, it is used to denote the pre-subject position in clauses (‘the complementiser position’) which is typically occupied by a complementiser like that/if/for, but which can also be occupied by an inverted auxiliary in sentences such as ‘Can you help?’, where can is said to occupy the complementiser position in the clause. A complementiser phrase (CP) is a phrase/clauseexpression headed by a complementiser (or by an auxiliary or verb occupying the complementiser position).

Complex sentence: One which contains more than one clause.

Component: A grammar is said to have three main components: a syntactic/computational component which generates syntactic structures, a semantic component which assigns each such syntactic structure an appropriate semantic interpretation, and a PF component which assigns each syntactic structure generated by the computational component an appropriate phonetic form. See §1.3.

Compound word: a word which is built up out of two (or more) other words - e.g. man-eater.

Computational component: See Component.

Concord: A traditional term to describe an operation whereby a noun and any adjectives or determiners modifying it are assigned the same values for features such as number, gender and case.

Conditional: A term used to represent a type of clause (typically introduced by if or unless) which lays down conditions - e.g. ‘If you don’t behave, I’ll bar you’, or ‘Unless you behave, I’ll bar you’. In these examples, the clauses If you don’t behave and Unless you behave are conditional clauses.
Condition on Extraction Domains: A constraint to the effect that only complements allow constituents to be extracted out of them, not specifiers or adjuncts. See §6.5.

Configurational: Positional - i.e. relating to the position occupied by one or more constituents in a tree diagram. For example, a configurational definition of a structural subject (for English) would be ‘an argument which occupies the specifier position in TP’. This definition is configurational in the sense that it tells you what position within TP the subject occupies.

CONJ: See Conjunction.

Conjoin: To join together two or more expressions by a coordinating conjunction such as and/or but. For example, in ‘Naughty but nice’, naughty has been conjoined with nice (and conversely nice has been conjoined with naughty).

Conjunct: One of a set of expressions which have been conjoined. For example, in ‘Rather tired but otherwise alright’, the two conjuncts (i.e. expressions which have been conjoined) are rather tired and otherwise alright.

Conjunction/CONJ: A word which is used to join two or more expressions together. For example, in a sentence such as ‘John was tired but happy’, the word but serves the function of being a coordinating conjunction because it coordinates (i.e. joins together) the adjectives tired and happy. In ‘John felt angry and Mary felt bitter’, the conjunction and is used to coordinate the two clauses John felt angry and Mary felt bitter. In traditional grammar, complementisers like that/for/if are categorised as (one particular type of) subordinating conjunction.

Constituent: A term denoting a structural unit - i.e. an expression which is one of the components out of which a phrase or sentence is built up. For example, the various constituents of a prepositional phrase (= PP) such as ‘Straight into touch’ (e.g. as a reply to ‘Where did the ball go?’) might be the preposition into, the noun touch, the adverb straight, and the intermediate projection (P-bar) into touch. To say that X is an immediate constituent of Y is to say that Y immediately contains X (see Contain), or equivalently that Y is the mother of X: see §2.6.

Constituent Structure: The constituent structure (or phrase structure, or syntactic structure) of an expression is (a representation of) the set of constituents which the expression contains. Syntactic structure is usually represented in terms of a labelled bracketing or a tree diagram.

Constrained: see Restrictive.

Constraint: A structural restriction which blocks the application of some process to a particular type of structure. The term tends to be used with the rather more specific meaning of ‘A grammatical principle which prevents certain types of grammatical operation from applying to certain types of structure.’

Contain: To say that one constituent X contains another constituent Y is to say that Y is one of the constituents out of which X is formed by a merger operation of some kind. In terms of tree diagrams, we can say that X contains Y if X occurs higher up in the tree than Y, and X is connected to Y by a continuous (unbroken) set of downward branches (the branches being represented by the solid lines connecting pairs of nodes in a tree diagram). If we think of a tree diagram as a network of train stations, we can say that X contains Y if it is possible to get from X to Y by travelling one or more stations south. To say that one constituent X immediately contains another constituent Y is to say that Y occurs immediately below X in a tree and is connected to X via a branch (or, that X contains Y and there is no intervening constituent Z which contains Y and which is contained by X). See §2.6.

Content: This term is generally used to refer to the semantic content (i.e. meaning) of an expression (typically, of a word). However, it can also be used is a more general way to refer to the linguistic properties of an expression: e.g. the expression phonetic content is sometimes used to refer to the phonetic form of (e.g.) a word: hence, we might say that PRO is a pronoun which has no phonetic content (meaning that it is a ‘silent’ pronoun with no audible form).

Contentives/content words: Words which have intrinsic descriptive content (as opposed to functors, i.e. words which serve essentially to mark particular grammatical functions). Nouns, verbs, adjectives and
(most) prepositions are traditionally classified as contentives, while pronouns, auxiliaries, determiners, complementisers, and particles of various kinds (e.g. infinitival to, genitive of) are classified as functors.

**Contraction:** A process by which two different words are combined into a single word, with either or both words being reduced in form. For example, by contraction, want to can be reduced to wanna, going to to gonna, he is to he’s, they have to they’ve, did not to didn’t, etc. See also **Cliticisation**.

**Contrastive:** In a sentence like ‘Syntax, I hate but phonology I enjoy’, the expressions syntax and phonology are contrasted, and each is said to be contrastive in use.

**Controller(Control ler)/Control predicate:** In non-finite clauses with a PRO subject which has an antecedent, the antecedent is said to be the controller of PRO (or to control PRO), and conversely PRO is said to be controlled by its antecedent; and the relevant kind of structure is called a control structure. So, in a structure like ‘John decided PRO to quit’, John is the controller of PRO, and conversely PRO is controlled by John. The term control predicate denotes a word like try which takes an infinitive complement with a (controlled) PRO subject. See §3.2.

**Converge(nce):** A derivation converges (and hence results in a well-formed sentence) if the resulting PF-representation contains only phonetic features, and the associated semantic representation contains only (semantically) interpretable features.

**Coordinate/Coordination:** A coordinate structure is a structure containing two or more expressions joined together by a coordinating conjunction such as and/but/lor/nor (e.g. ‘John and Mary’ is a coordinate structure.). Coordination is an operation by which two or more expressions are joined together by a coordinating conjunction.

**Copula/Copular Verb:** A ‘linking verb’, used to link a subject with a nonverbal predicate. The main copular verb in English is be (though verbs like become, remain, stay etc. have much the same linking function). In sentences such as ‘They are lazy’, ‘They are fools’ and ‘They are outside’, the verb are is said to be a copula in that it links the subject they to the adjectival predicate lazy, or the nominal predicate fools, or the prepositional predicate outside.

**Copy/Copying:** The Copy Theory of Movement is a theory developed by Chomsky which maintains that a moved constituent leaves behind a (trace) copy of itself when it moves, with the copy generally having its phonetic features deleted and so being null: see §4.3, §5.3 and §6.2. Feature Copying is an operation by which the value of a feature on one constituent is copied onto another (e.g. the values of the person/number features of a subject are copied onto an auxiliary): see §7.3.

**Coreferential:** Two expressions are coreferential if they refer to the same entity. For example, in ‘John cut himself while shaving’, himself and John are coreferential in the sense that they refer to the same individual.

**Count/Countability:** A countable noun is a noun which can be counted. Hence, a noun such as chair is a count noun since we can say ‘One chair, two chairs, three chairs, etc.’; but a noun such as furniture is a non-count/uncountable/mass noun since we cannot say ‘*one furniture, *two furnitures, etc.’ The countability properties of a noun determine whether the relevant item is a count noun or not.

**Counterexample:** An example which falsifies a particular hypothesis. For example, an auxiliary like ought would be a counterexample to any claim that auxiliaries in English never take an infinitive complement introduced by to (cf. ‘You ought to tell them’).

**CP:** Complementiser phrase (See Complementiser).

**Crash:** A derivation is said to crash if one or more features carried by one or more constituents is illegible at either or both of the interface levels (the phonetics interface and the semantics interface). For example, if the person or number features of HAVE remain unvalued in a sentence such as ‘He HAVE left’, the resulting sentence will crash at the phonetics interface, since the PF component will be unable to determine whether HAVE should be spelled out as have or has.

**Cycle/Cyclic:** Syntactic operations (like agreement and movement) are said to apply in a cyclic fashion, such that each time a head H is merged with one or more other constituents, a new cycle of operations begins (in the sense that any operation affecting H and one or more other constituents which it
c-commands applies at this point). See §4.7.

**D:** see **Determiner**.

**Dat:** An abbreviation for **dative case**. See **Case**.

**Daughter:** A node X is the daughter of another node Y if Y is the next highest node up in the tree from X, and the two are connected by a **branch** (solid line).

**Declarative:** A term used as a classification of the **force** (i.e. semantic type) of a clause which is used to make a statement (as opposed to an **interrogative, exclamative** or **imperative** clause).

**Default:** A default value or property is one which obtains if all else fails (i.e. if other conditions are not satisfied). For example, if we say that –Ø is the default verbal inflection for regular verbs in English, we mean that regular verbs carry the inflection –s if third person singular present tense forms, -d if past, perfect or passive forms, -ing if progressive or gerund forms, and –Ø otherwise (by default).

**Defective:** A defective item is one which lacks certain properties. For example, if we suppose that T constituents generally carry person and number features, then infinitival **to** in all infinitive structures except **control** infinitives is a defective T constituent in that (under Chomsky’s analysis) it carries person but not number. Any clause containing a defective T constituent is a **defective clause**.

**Definite:** Expressions containing determiners like **the, this, that** etc. are said to have **definite reference** in that they refer to an entity which is assumed to be known to the addressee(s): e.g. in a sentence such as ‘I hated the course’, the DP **the course** refers to a specific (e.g. Minimalist Syntax) course whose identity is assumed to be known to the hearer/reader. In much the same way, personal pronouns like **he/she/it/they** etc. are said to have definite reference. By contrast, expressions containing a determiner like **a** are **indefinite**, in that (e.g.) if you say ‘I’m taking a course’, you don’t assume that the hearer/reader knows which course you are taking.

**DEG:** A degree word like **so/too/how**.

**Demonstrative:** This is a term used to refer to words like **this/that, these/those and here/there** which indicate a location relatively nearer to or further from the speaker (e.g. **this book** means ‘the book relatively close to me’, and **that book** means ‘the book somewhat further away from me’).

**Derivation:** The derivation of a phrase or clause is the set of syntactic (e.g. merger and movement) operations used to form the relevant structure. The derivation of a word is the set of morphological operations used to form the word.

**Derive:** To **derive** a structure it to say how it is formed (i.e. specify the operations by which it is formed).

**Derived structure:** A structure which is produced by the application of one or more syntactic (merger, movement or agreement) operations.

**Descriptive adequacy:** A grammar of a particular language attains descriptive adequacy if it correctly specifies which strings of words do (and don’t) form grammatical phrases and sentences in the language, and correctly describes the structure and interpretation of the relevant phrases and sentences. See §1.3.

**DET/Determiner:** A word like **the/this/that** which is typically used to modify a noun, but which has no descriptive content of its own. Most determiners can be used either prenominally (i.e. in front of a noun that they modify) or pronominally (i.e. used on their own without a following noun) – cf. ‘I don’t like that ideal I don’t like that’.

**Determiner Phrase:** A phrase like **the king (of Utopia) which comprises a determiner the, and a noun complement like king or a noun phrase complement like king of Utopia. In work before the mid 1980s, a structure like the king of Utopia would have been analysed as a noun phrase (= NP), comprising the head noun king, its complement of Utopia and its specifier the. Since Abney (1987), such expressions have been taken to have the status of DP/determiner phrase.

**Direct Object:** See **Object**.

**Discontinuous spellout:** A phenomenon whereby part of a moved phrase is spelled out in the position in which it originates, and the remainder in the position in which it ends up – as in ‘How much do you
believe of what he tells you?”, where the wh-phrase how much of what he tells you moves to the front of the sentence, with how much being spelled out in the position it moves to, and of what he tells you being spelled out in the position in which it originates. See §5.3.

**Discourse:** Discourse factors are factors relating to the extrasentential setting in which an expression occurs (where extrasentential means ‘outside the immediate sentence containing the relevant expression’). For example, to say that the reference of PRO is discourse-determined in a sentence such as ‘It would be wise PRO to prepare yourself for the worst’ means that PRO has no antecedent within the sentence immediately containing it, but rather refers to some individual(s) outside the sentence (in this case, the person being spoken to).

**Distribution/Distributional:** The distribution of an expression is the set of positions which it can occupy within an appropriate kind of phrase or sentence. Hence, a distributional property is a word-order property.

**Domain:** The domain (or, more fully, c-command domain) of a head H is the set of constituents c-commanded by H – namely its sister and all the constituents contained within its sister. For example, the domain of C includes its TP complement and any constituent of the relevant TP.

**Do-Support:** This refers to the use of the ‘dummy’ (i.e. meaningless) auxiliary do to form questions, negatives or tags in sentences which would otherwise contain no auxiliary. Hence, because a nonauxiliary verb like want requires do-support in questions/negatives-tags, we have sentences such as ‘Does he want some?’, ‘He doesn’t want any’, and ‘He wants some, does he?’ See §4.8.

**Double-object construction:** See Object DP. See Determiner Phrase.

**DP Hypothesis:** The hypothesis that all nominal arguments have the status of DPs - not just nominals like the president which contain an overt determiner, but also ‘bare’ nominal arguments like politicians and promises (in sentences like ‘Politicians break promises’).

**D-pronoun:** A pronoun like that in ‘I don’t like that’ which seems to be a pronominal determiner.

**Earliness Principle:** A principle which says that linguistic operations must apply as early in a derivation as possible.

**Early Modern English:** The type of English found in the early seventeenth century (i.e. at around the time Shakespeare wrote most of his plays, between 1590 and 1620).

**Echo question:** A type of sentence used to question something which someone else has just said (often in an air of incredulity), repeating all or most of what they have just said. For example, if I say ‘I’ve just met Nim Chimpsky’ and you don’t believe me (or don’t know who I’m talking about), you could reply with an echo question such as ‘You’ve just met who?’

**Edge:** The edge of a given projection HP is that part of HP which excludes the complement of H (hence, that part of the structure which includes the head H and any specifier/s or adjunct/s which it has).

**ECM:** See Exceptional Case Marking.

**Economy Principle:** A principle which requires that (all other things being equal) syntactic representations should contain as few constituents and syntactic derivations involve as few grammatical operations as possible.

**Elizabethan English:** The type of English found in the early seventeenth century, during the reign of Queen Elizabeth I (i.e. at around the time Shakespeare wrote most of his plays, between 1590 and 1620).

**Ellipsis/Elliptical:** Ellipsis is an operation by which an expression is omitted (in the sense that its phonetic features are deleted and so unpronounced), e.g. in order to avoid repetition. For example, in a sentence such as ‘I will do it if you will do it’, we can ellipse (i.e. omit) the second occurrence of do it to avoid repetition, and hence say ‘I will do it if you will’. An elliptical structure is one containing an ‘understood’ constituent which has undergone ellipsis (i.e. been omitted).
**Embedded clause**: A clause which is positioned internally within another constituent. For example, in a sentence such as ‘He may suspect that I hid them’, the hid-clause (= that I hid them) is embedded within (and is the complement of) the verb phrase headed by the verb suspect. Likewise, in ‘The fact that he didn’t apologise is significant’, the that-clause (that he didn’t apologise) is an embedded clause in the sense that it is embedded within a noun phrase headed by the noun fact. A clause which is not embedded within any other expression is a **root clause** (see **Root**) or **main clause**.

**EME**: See **Early Modern English**.

**Empirical evidence**: Evidence based on observed linguistic phenomena. In syntax, the term ‘empirical evidence’ usually means ‘evidence based on grammaticality judgments by native speakers.’ For example, the fact that sentences like *‘Himself likes you’* are judged ungrammatical by native speakers of Standard English provides us with empirical evidence that anaphors like himself can’t be used without an appropriate antecedent (i.e. an expression which they refer back to).

**Empty**: A constituent is empty/null if it is ‘silent’ and hence has no overt phonetic form. Empty categories include null subject pronouns like PRO and pro, null relative pronouns (like the null counterpart of who in someone who I know well), null determiners (like that in ‘Ø John is tired’), and null trace copies of moved constituents. See ch.3.

**Enclitic/Encliticise**: See **Clitic**.

**Entry**: A lexical entry is an entry for a particular word in a dictionary (and hence by extension refers to the set of information about the word given in the relevant dictionary entry).

**EPP**: This was originally an abbreviation for the **Extended Projection Principle**, which posited that every T constituent must be extended into a TP projection which has a specifier. In more recent work, the requirement for a T constituent like will to have a specifier is said to be a consequence of T carrying an [EPP] feature requiring it to project a specifier.

**Ergative**: This term originally applied to languages like Basque in which the complement of a transitive verb and the subject of an intransitive verb are assigned the same morphological case. However, by extension, it has come to be used to denote verbs like break which occur both in structures like ‘Someone broke the window’ and in structures like ‘The window broke’, where the window seems to play the same semantic/thematic role in both types of sentences, in spite of being the complement of broke in one sentence and the subject of broke in the other. See §8.3.

**Exceptional Case Marking/ECM**: Accusative subjects of infinitive clauses (e.g. him in ‘I believe him to be innocent’) are said to carry exceptional accusative case (in that the case of the accusative subject is assigned by the main-clause verb believe, and it is exceptional for the case of the subject of one clause to be assigned by the verb in a higher clause). Verbs (like believe) which take an infinitive complement with an accusative subject are said to be **ECM verbs**. See §3.8 and §7.9.

**Exclamative**: A type of structure used to exclaim surprise, delight, annoyance, etc. In English syntax, the term is restricted largely to clauses beginning with wh-exclamative words like What! or How! - e.g. ‘What a fool I was!’ or ‘How blind I was!’ See §5.9 and §8.2.

**Existential**: An existential sentence is one which is about the existence of some entity. For example, a sentence such as ‘Is there any coffee left?’ questions the existence of coffee. Consequently, the word any here is sometimes said to be an **existential quantifier** (as is some in a sentence like ‘There is some coffee in the pot’).

**Experience**: Children’s experience is the speech input which they receive (or, more generally, the speech activity which they observe) in the course of acquiring their native language.

**EXPERIENCER**: A term used in the analysis of semantic/thematic roles to denote the entity which experiences some emotional or cognitive state - e.g. John in ‘John felt unhappy’, or ‘John thought about his predicament’. See §6.4.

**Explanatory Adequacy**: A linguistic theory meets the criterion of explanatory adequacy if it explains why grammars have the properties that they do, and how children come to acquire grammars in such a short period of time. See §1.3.
**Expletive**: A ‘dummy’ constituent with no inherent semantic content, such as the pronoun *there* in existential sentences like ‘There is no truth in the rumour’, or the pronoun *it* in sentences such as *It is unclear why he resigned*. See §7.5 and §7.6.

**Expression**: This word is used in the text as an informal term meaning a string (i.e. continuous sequence) of one or more words which form a **constituent**.

**Extended Projection Principle**: See EPP.

**External Argument**: See Argument.

**Extract/Extraction**: Extract(ion) is another term for **move(ment)**, and so denotes an operation by which one constituent is moved out of another. E.g. in a structure such as ‘Who do you think [he saw ---]’ the pronoun *who* has been extracted out of the bracketed clause (i.e. it is been moved out of the position marked ---), and moved to the front of the overall sentence. The **extraction site** for a moved constituent is the position which it occupied before undergoing movement.

**F**: This symbol is used as a convenient notational device to denote an abstract functional head (or an abstract feature) of some kind.

**Feature**: A device used to describe a particular grammatical property. For example, the distinction between count and noncount nouns might be described in terms of a feature such as [±COUNT]. On **Feature Copying**, see Copying. **Feature Deletion** is an operation by which uninterpretable features are deleted: see §7.4.

**Feminine**: This term is used in discussion of grammatical **gender** to denote pronouns like *she/her/hers* which refer to female entities.

**FHC**: See **Functional Head Constraint**.

**Filled**: To say that a given position in a structure must be filled is to say that it cannot remain empty but rather must be occupied (usually by an overt constituent of an appropriate kind).

**Fin/Finite/FinP**: The term **finite verb/finite clause** denotes (a clause containing) an auxiliary or nonauxiliary verb which can have a nominative subject like *I/we/he/she/they*. For example, compare the two bracketed clauses in:

(i) What if [people annoy her]? 
(ii) Don’t let [people annoy her]

The bracketed clause and the verb *annoy* in (i) are finite because in place of the subject *people* we can have a nominative pronoun like *they*; by contrast, the bracketed clause and the verb *annoy* are nonfinite in (ii) because *people* cannot be replaced by a nominative pronoun like *they* (only by an accusative pronoun like *them*): cf.

(iii) What if [they annoy her]? 
(iv) Don’t let [them/*they annoy her]

By contrast, a verb or clause which has a subject with accusative or null case in English is nonfinite; hence the bracketed clauses and italicised verbs are nonfinite in the examples below:

(v) Don’t let [them *annoy her*] 
(vi) You should try [PRO to help]

Nonfinite forms include **infinitive** forms like *be*, and **participle** forms like *being/been*. In work by Luigi Rizzi on split CP projections (discussed in §8.3), infinitival complementisers like Italian *di* ‘of’ and English *for* are said to occupy the head **Fin** (‘Finiteness’) position within a **FinP** (‘Finiteness Phrase’) projection.

**First Person**: See Person.

**Floating Quantifier**: A quantifier which is separated from the expression which it quantifies. For example, in a sentence such as ‘The students have *all* passed their exams’, *all* quantifies (but is not positioned next to) the *students*, so that *all* is a floating quantifier here.

**Foc/Focus/Focusing/FocP**: **Focus** position in a sentence is a position occupied by a constituent which is emphasised in some way (usually in order to mark it as containing ‘new’ or ‘unfamiliar’ information). For example, in a **cleft sentence** such as ‘It’s syntax that they hate most’ or a **pseudo-cleft** sentence such as
‘What they hate most is syntax’, the expression syntax is said to occupy focus position within the relevant sentence. Focusing denotes a movement operation by which a constituent is moved into a focus position at the beginning of a clause in order to highlight it (e.g. to mark it as introducing new information). Thus, in a sentence like ‘Nothing could they do to save her’, the expression nothing has been focused by being moved to the front of the overall sentence from its underlying position as the complement of the verb do.

In work on split CP projections by Luigi Rizzi (discussed in §8.2), preposed focused expressions are said to occupy the specifier position within a FocP (‘Focus Phrase’) projection which is headed by an abstract Foc (‘Focus’) head.

Foot: The foot of a (movement) chain is the constituent which occupies the lowest position in the chain.

Force: The complementisers that/if in a sentence such as I didn’t know [that/if he was lying] are said to indicate that the bracketed clauses are declarative/interrogative in force (in the sense that they have the force of a question/a statement). In work on split CP projections by Luigi Rizzi (discussed in §8.2-§8.3), complementisers are said to constitute a Force head which can project into a Force Phrase.

Formal: In an expression such as formal speech style, the word formal denotes a very careful and stylised form of speech (as opposed to the kind of informal colloquial style used in a casual conversation in a bar): in an expression such as formal features, the word formal means ‘grammatical’ (i.e. features which play a role in morphology/syntax).

Fragment: An utterance which is not a complete sentence (in the sense that it does not constitute a clause). So, a phrase such as ‘A new dress’ used in reply to a question such as ‘What did you buy?’ would be a sentence-fragment (By contrast, a sentence such as ‘I bought a new dress’ would not be a sentence-fragment, since it contains a complete clause.)

Front/Fronting: Fronting is an informal term to denote a movement operation by which a given expression is fronted – i.e. moved to the front of some phrase or sentence.

Function: Expressions such as subject, specifier, complement, object, head, and adjunct are said to denote the grammatical function which a particular expression fulfils in a particular structure (which in turn relates to the position which it occupies and certain of its grammatical properties - e.g. case and agreement properties).

Functional Category/Functional Head Constraint/Function Word/Functor: A word which has no descriptive content and which serves an essentially grammatical function is said to be a function word or functor (By contrast, a word which has descriptive content is a content word or contentive). A functional category is a category whose members are function words: hence, categories such as complementiser, auxiliary, infinitive particle, case particle, or determiner are all functional categories – as well as the expressions they head (e.g. C-bar/CP, T-bar/TP, D-bar/DP etc.). The Functional Head Constraint is a grammatical principle which specifies that the complement of a certain type of functional head (including C and D) cannot be preposed on its own without also moving the functional head: see §2.5.

Gapping: a form of ellipsis in which the head word is omitted from one (or more) of the conjuncts in a coordinate structure in order to avoid repetition. For example, the italicised second occurrence of bought can be gapped (i.e. omitted) in a sentence such as ‘John bought an apple and Mary bought a pear’, giving ‘John bought an apple, and Mary a pear’.

Gen: In one use, an abbreviation for genitive case; in another, an abbreviation for gender.

Gender: A grammatical property whereby words are divided into different grammatical classes which play a role in agreement/concord relationships. In French, for example, nouns are intrinsically masculine or feminine in gender (e.g. pommier ‘apple tree’ is masculine, but pomme ‘apple’ is feminine), and determiners inflect for gender (as well as number), so that un ‘a’ is the masculine form of the indefinite article, and une is its feminine form. Determiners in French have to agree in gender (and number) with the nouns they modify, hence we say un pommier ‘an apple tree’, but une pomme ‘an apple’. In English, nouns no longer have inherent gender properties, and adjectives/determiners don’t inflect for gender either. Only personal pronouns like he/she/it carry gender properties in modern English, and these are
traditionally said to carry masculine/feminine/neuter gender respectively (though the term inanimate is sometimes used in place of neuter).

**Generate/Generative**: The syntactic component of a grammar is said to generate (i.e. specify how to form) a set of syntactic structures. A grammar which does so is said to be a generative grammar.

**Generic**: To say that an expression like eggs in a sentence such as ‘Eggs are fattening’ has a generic interpretation is to say that it is interpreted as meaning ‘eggs in general’.

**Genitive**: See Case.

**Gerund**: When used in conjunction with the progressive aspect auxiliary be, verb forms ending in -ing are progressive participles; in other uses they generally function as gerunds. In particular, -ing verb forms are gerunds when they can be used as subjects, or as complements of verbs or prepositions, and when (in literary styles) they can have a genitive subject like my. Thus writing is a gerund (verb form) in a sentence such as ‘She was annoyed at [my writing to her mother]’, since the bracketed gerund structure is used as the complement of the preposition at, and has a genitive subject my.

**GOAL/Goal**: The term GOAL is used in the analysis of semantic/thematic roles to denote the entity towards which something moves – e.g. Mary in ‘John sent Mary a letter’: see §6.4. In a different sense, the term goal represents a constituent which agrees with a higher head which serves as a probe: see §7.2.

**Grammar**: In traditional terms, the word grammar relates to the study of morphology and syntax. In a broader Chomskyan sense, grammar includes the study of phonology and semantics: i.e. a grammar of a language is a computational system which derives the Phonetic Form and Semantic Representation of expressions.

**Grammatical**: An expression is grammatical if it contains no morphological or syntactic error, and ungrammatical if it contains one or more morphological or syntactic errors. Grammatical features are (e.g. person, number, gender, case etc.) features which play a role in grammatical operations (e.g. in determining case or agreement properties).

**Have-cliticisation**: An operation by which have (in the guise of its contracted clitic variant /v/) attaches to an immediately preceding word ending in a vowel or diphthong, resulting in forms such as I’ve, we’ve, they’ve, etc.

**Head**: This term has two main uses. The head (constituent) of a phrase is the key word which determines the properties of the phrase. So, in a phrase such as fond of fast food, the head of the phrase is the adjective fond, and consequently the phrase is an adjectival phrase (and hence can occupy typical positions associated with adjectival expressions - e.g. as the complement of is in ‘He is fond of fast food’). In many cases, the term head is more or less equivalent to the term word (e.g. in sentences such as ‘An accusative pronoun can be used as the complement of a transitive head’). In a different use of the same word, the head of a movement chain is the highest constituent in the chain.

**Headed/Headedness Principle**: An expression is headed if it has a head. The Headedness Principle specifies that every constituent must be headed (i.e. must have a head). So, for example, an expression like fond of fast food is headed by the adjective fond and so is an adjectival phrase. See Head.

**Head-first/-last**: A head-first structure is one in which the head of an expression is positioned before its complement(s); a head-last structure is one in which the head of an expression is positioned after its complement(s). See §1.6.

**Head movement**: Movement of a word from one head position to another (e.g. movement of an auxiliary from T to C, or of a verb from V to T, or of a noun from N to D). See ch.4.

**Head Movement Constraint/HMC**: A principle of Universal grammar which specifies that movement between one head position and another is only possible between the head of a given structure and the head of its complement. See §4.5.

**Head Position Parameter**: The parameter which determines whether a language positions heads before or after their complements. See §1.6.
**Head Strength Parameter**: A parameter whose setting determines whether a given kind of head is **strong** and can trigger movement of a lower head to attach to it, or **weak** and so cannot attract a lower head to move to attach to it. See §4.5.

**HMC**: See Head Movement Constraint.

**Homophonous**: Two different expressions are homophonous if they have the same phonetic form (e.g. we’ve and weave).

**Host**: An expression to which a clitic or affix attaches. For example, if n’t cliticises onto could in expressions like couldn’t, we can say that could is the host onto which n’t cliticises.

**I**: See INFL.

**Identify**: In the relevant technical sense, we can say that in a relative clause like that italicised in ‘I’m looking for someone whom I can trust’ the relative pronoun whom can be deleted because it can be identified by its antecedent someone (in the sense that the grammatical features carried by the pronoun will match those of its antecedent). See §5.10.

**Idiom**: A string of words which has an idiosyncratic meaning (e.g. hit the roof in the sense of ‘get angry’).

**I-language**: I-language is a linguistic system internalised (i.e. internally represented) within the brain. See §1.3.

**Illegible**: See Legible.

**Immediate constituent**: See Constituent.

**Immediately contain**: See Contain.

**Imp**: A symbol used to designate an (affixal) imperative morpheme which occupies the head C position of CP in imperatives: see ex. X.

**Impenetrable**: Inaccessible. See Phase Impenetrability Condition.

**Imperative**: A term employed to classify a type of sentence used to issue an order (e.g. ‘Be quiet!’), ‘Don’t say anything!’), and also to classify the type of verb-form used in an imperative sentence (e.g. be is an imperative verb-form in ‘Be quiet!’).

**Inanimate**: See Animate.

**Inclusiveness Condition**: A grammatical principle proposed by Chomsky (1999, p.2) which ‘bars introduction of new elements (features) in the course of a derivation’.

**Indefinite**: See Definite.

**Indicative**: Indicative (auxiliary and main) verb forms are finite forms which are used (inter alia) in declarative and interrogative clauses (i.e. statements and questions). Thus, the italicised items are said to be indicative in mood in the following sentences: ‘He is teasing you’, ‘Can he speak French?’, ‘He had been smoking’, ‘He loves chocolate’, ‘He hated syntax’. An **indicative clause** is a clause which contains an indicative (auxiliary or nonauxiliary) verb. See Mood.

**Infinitive**: The infinitive form of a verb is the (uninflected) form which is used (inter alia) when the verb is the complement of a modal auxiliary like can, or of the infinitive particle to. Accordingly, the italicised verbs are infinitive forms in sentences like ‘He can speak French’, and ‘He’s trying to learn French.’ An **infinitive clause** is a clause which contains a verb in the infinitive form. Hence, the bracketed clauses are infinitive clauses in: ‘He is trying [to help her]’, and ‘Why not let [him help her]?’ (In both examples, help is an infinitive verb form, and to when used with an infinitive complement is said to be an infinitive particle.) Since clauses are analysed as phrases within the framework used here, the term **infinitive phrase** can be used interchangeably with **infinitive clause**, to denote a TP projection headed by the infinitive particle to (or by a null counterpart of the infinitive particle to).

**INFL**: A category devised by Chomsky (1981) whose members include finite auxiliaries (which are INFlected for tense/agreement), and the INFinitival particle to. In more recent work, T is used in place of INFL.
**Inflection/Inflectional**: An inflection is an *affix* which marks grammatical properties such as number, person, tense, case. For example, a plural noun such as *dogs* in English comprises the stem form *dog* and the plural number inflection *–s*. **Inflectional morphology** is the grammar of *inflections*.

**Inherent case**: See **Case**.

**Initial grammar**: The earliest grammar of their native language developed by infants.

**Innateness hypothesis**: The hypothesis that children have a biologically endowed innate language faculty. See §1.4.

**In situ**: A constituent is said to remain *in situ* (i.e. ‘in place’) if it doesn’t undergo a given kind of movement operation.

**Interface levels**: Levels at which the grammar interfaces (i.e. connects) with speech and thought systems which lie outside the domain of grammar. **Phonetic Form** is the level at which the grammar interfaces with articulatory-perceptual (speech) systems, and **Semantic Representation** is the level at which it interfaces with conceptual-intentional (thought) systems.

**Intermediate projection**: See **Projection**.

**Internal argument**: See **Argument**.

**Internalised grammar**: A grammar which is internally represented within the mind/brain.

**Interpretable**: A feature is (semantically) interpretable if it has semantic content: so, for example, a feature such as [Plural-Number] on a pronoun like *they* is interpretable, but a phonological feature like [+nasal] is uninterpretable, and so too are many grammatical/formal features (e.g. case features). See §7.4.

**Interpretation**: To say that an expression has a particular (semantic) interpretation is to say that it expresses a particular meaning. So, for example, we might say that a sentence such as ‘He loves you more than Sam’ has two different interpretations - one on which *Sam* has a subject interpretation and is implicitly understood as the subject of *loves you*, and a second on which *Sam* has an object interpretation and is implicitly understood as the object of *he loves*. The first interpretation can be paraphrased as ‘He loves you more than Sam loves you’, and the second as ‘He loves you more than he loves Sam.’

**Intermediate projection**: A projection which is larger than a word, but smaller than a phrase. See **Bar**.

**Internal argument**: Complement. See **Argument**.

**Interrogative**: An interrogative clause or sentence is one which asks a question. See **Questions**.

**Intransitive**: see **Transitive**.

**Intuitions**: Judgments given by native speakers about the grammaticality, interpretation and structure of expressions in their language.

**Inversion/Inverted**: A term used to denote a movement process by which the relative order of two expressions is reversed. It is most frequently used in relation to the more specific operation by which an auxiliary (and, in earlier stages of English, nonauxiliary) verb comes to be positioned before its subject, e.g. in questions such as ‘Can you speak Swahili?’, where *can* is positioned in front of its subject *you*. See ch.4. An *inverted auxiliary/verb* is one which is positioned in front of its subject (e.g. *will* in ‘Will I pass the syntax exam?’).

**Irrealis**: An infinitive complement like that italicised in ‘They would prefer *(for)* you to abstain’ is said to denote an *irrealis* (a Latin word meaning ‘unreal’) event in the sense that the act of abstention is a hypothetical event which has not yet happened and may never happen.

**Island**: A structure out of which no subpart can be extracted. For example, co-ordinate structures like *William and Harry* are **islands** in this sense. Hence, in a sentence like ‘I admire William and Harry’, we can topicalise the whole co-ordinate structure *William and Harry* by moving it to the front of the overall sentence (as in ‘*William and Harry, I admire*’), but we cannot topicalise *Harry* alone (as we see from the ungrammaticality of *‘Harry I admire William and’*).

**K. Case particle**: See **Case**.
Label: A notational device used to represent linguistic (particularly categorial) properties of constituents. For example, if we say that the word *man* belongs to the category N of noun, we are using N as a label to indicate the categorial properties of the word *man* (i.e. to tell us what grammatical category *man* belongs to).

Labelled bracketing: See Bracketing.

Landing site: The landing-site for a moved constituent is the position it ends up in after it has been moved (e.g. The specifier position within CP is the landing-site for a moved wh-expression).

Language Faculty: Chomsky argues that humans beings have an innate Language Faculty which provides them with an algorithm (i.e. set of procedures or programme) for acquiring a grammar of their native language(s). See §1.4.

LBC: See Left Branch Condition.

Learnability: A criterion of adequacy for linguistic theory. An adequate theory must explain how children come to learn the grammar of their native languages in such a short period of time, and hence must provide for grammars of languages which are easily learnable by children. See §1.3.

Left Branch Condition: A constraint which specifies that in languages like English, the leftmost constituent of a nominal, adjectival or adverbial expression cannot be moved out of the expression containing it.

Legible: To say that syntactic structures must be legible at the semantics and phonetics interfaces is to say that the structures inputted to the semantic component of the grammar must contain only features which contribute to semantic interpretation, and that the structures inputted to the PF component must contain only features which contribute to determining the phonetic form of an expression. Any structure which is not legible at a given interface is said to be illegible to the relevant interface.

Level: In the sense in which this term is used in this book, constituents like T, T-bar and TP represent different projection levels – i.e. successively larger types of category (T being a minimal projection, T-bar an intermediate projection, and TP a maximal projection). See Projection.

Lexical/Lexicon: The word lexical is used in a number of different ways. Since a lexicon is a dictionary (i.e. a list of all the words in a language and their idiosyncratic linguistic properties), the expression lexical item in effect means ‘word’, the expression lexical entry means ‘the entry in the dictionary for a particular word’, the term lexical property means ‘property of some individual word’, the term lexical learning means ‘learning words and their idiosyncratic properties’, and the term lexical array means ‘the set of words out of which a given expression is formed’. However, the word lexical is also used in a second sense, in which it is contrasted with functional (and hence means ‘non-functional’). In this second sense, a lexical category is a category whose members are contentives (i.e. items with idiosyncratic descriptive content): hence, categories such as noun, verb, adjective or preposition are lexical categories in this sense. So, for example, the term lexical verb means ‘main verb’ (i.e. a nonauxiliary verb like *go, find, hate, want* etc.).

LF(-representation): (A representation of the) Logical Form (of an expression). See Representation. The LF-component of a grammar is the (semantic) component which converts the syntactic structures produced by merger and movement operations into LF-representations.

Light verb: This term is traditionally used to denote verbs (e.g. like *take/make* in expressions like *make fun of* and *take heed of*) with relatively little semantic content. However, in recent work on VP shells discussed in §8.3-§8.5, this term is extended to denote an abstract affixal verb (often with a causative sense like that of *make*) to which a noun, adjective or verb adjoins. For example, it might be claimed that the suffix -en in a verb like *sadden* is an affixal light verb which combines with adjectives like *black, white* and *sad* to form the causative verb *sadden* (which has a meaning loosely paraphrasable as ‘make sad’, or ‘cause to become sad’). This type of analysis can be extended to verbs like *roll* as they are used in sentences like ‘He rolled the ball down the hill’, if we assume that *roll* here is used causatively (and so has a meaning paraphrasable as ‘make roll’, or ‘cause to roll’), and hence involves adjunction of the verb *roll* to an abstract light-verb (which can be thought of as a null verbal counterpart of -en).
**Link**: A constituent (or position) which is part of a **movement chain**.

**Local**: One constituent X can agree with another constituent Y only if Y is in the **local c-command domain** of X – i.e. only if Y is c-commanded by X and if Y is sufficiently close to X. In recent work, Chomsky has defined closeness (for syntactic operations like agreement) in terms of the **Phase Impenetrability Condition**.

**Locative**: This is a term which denotes the semantic/thematic function of a constituent. A locative expression is one which denotes place. So, for example, *there/where* are locative pronouns in sentences such as ‘Are you going *there*?’ or ‘*Where* are you going?’ See §6.4.

**Locus**: To say that T is the **locus** of tense is to say that the tense property of a tensed clause or tensed auxiliary or main verb originates as a tense feature (or tense affix) carried by the head T constituent of TP.

**Long-distance movement**: A long-distance movement operation is one which moves a constituent out of one clause (TP/CP) into another.

**Main clause**: see **Root clause**.

**Main verb**: A non-auxiliary verb. See **Auxiliary**.

**Masc(uline)**: This term is used in discussions of grammatical **gender** to denote pronouns like *he/him/his* which refer to male entities.

**Mass noun**: See **Count noun**.

**Matrix**: In a sentence such as ‘I think *he lied*’, the (italicised) *lied* clause is an **embedded/complement clause** (by virtue of being embedded as the complement of the verb *think*), and the *think* clause is the **matrix clause**, in the sense that it is the clause immediately containing the *lied* clause.

**Maximal Projection**: See **Projection**.

**Merge(r)**: An operation by which two constituents are combined together to form a single larger constituent. See ch.2.

**MFCF**: See **Multiply Filled COMP Filter**.

**Minimalism/Minimalist program**: A theory of grammar developed by Chomsky whose core assumption is that grammars are minimally complex, perfect systems of optimal design. See §1.3.

**Minimal projection**: See **Projection**.

**MIT**: The Massachusetts Institute of Technology (located in Cambridge Massachusetts), where Chomsky has worked for the past five decades.

**Modal/Modality**: A modal auxiliary is an auxiliary which expresses **modality** (i.e. notions such as possibility, futurity or necessity). The set of modal auxiliaries found in English is usually assumed to include *will/would/can/could/shall/should/may/might/must/ought, and need/dare* when followed by a ‘bare’ (to-less) infinitive complement.

**Modifier/Modify**: In an expression such as *tall men*, it is traditionally said that the adjective *tall modifies* (i.e. attributes some property to) or is a **modifier** of the noun *men*. Likewise, in a sentence such as ‘Eat slowly!’ the adverb *slowly* is said to **modify** the verb *eat* (in the sense that it describes the manner in which the speaker is being told to eat).

**Module**: An individual component of a larger system. For example, a grammar might be said to contain a **case module** - i.e. a component which accounts for the case properties of relevant constituents.

**Mood**: This is a term describing inflectional properties of finite verbs. (Auxiliary and nonauxiliary) verbs in English can be in the **indictative mood, subjunctive mood, or imperative mood**. Examples of each type of mood are given by the italicised verb forms in the following: *He hates [= indicative] spaghetti*; ‘The court ordered that he *be* [= subjunctive] detained indefinitely’; ‘*Keep*= [imperative] quiet!’ The mood of the verb determines aspects of the interpretation of the relevant clause, so that e.g. subjunctive verbs occur in **irrealis** clauses.
**Morpheme:** The smallest unit of grammatical structure. Thus, a plural noun such as *cats* comprises two morphemes, namely the stem *cat* and the plural suffix -*s*.

**Morphology/morphological:** Morphology studies how morphemes are combined together to form words. Morphological properties are properties relating to the form of words (i.e. relating to the inflections or affixes they carry). For example, it is a morphological property of regular count nouns that they have a plural form ending in -*s*.

**Morphosyntactic:** A morphosyntactic property is a ‘grammatical’ property, i.e. a property which affects (or is affected by) relevant aspects of morphology and syntax. For instance, *case* is a morphosyntactic property in that (e.g.) pronouns have different morphological forms and occupy different syntactic positions according to their case: e.g. the nominative form of the first person plural pronoun is *we* and its accusative form is *us*; the two occupy different syntactic positions in that the nominative form occurs as the subject of a finite verb, whereas the accusative form occurs as the complement of a transitive verb or preposition: cf. ‘*We disagree*’, ‘*Join us*’.

**Mother:** A constituent X is the mother of another constituent Y if X is the next highest node up in the tree from Y, and the two are connected by a branch (solid line). See §2.6.

**Multiple agreement:** Agreement between a probe and more than one goal. See §7.6.

**Multiple wh-questions:** Questions containing more than one wh-word. See §5.7.

**Multiple specifiers:** In his (1995) book and subsequent work, Chomsky suggests that certain types of head may allow more than one specifier (e.g. a light verb with an external argument/subject as its inner specifier may attract a wh-expression to become its outer specifier: see §9.5).

**Multiply Filled COMP Filter:** A constraint which specifies that (in present-day English) no overt complementiser (like *that/if/for*) can have an overt specifier.

**N:** See Noun.

**Natural language:** A language acquired in a natural setting by human beings (hence, excluding e.g. computer languages, animal communication systems, etc.).

**NEG:** The head constituent of a NEGP (i.e. of a Negation Phrase constituent which contains *not* as its specifier). See §4.7.

**Negation:** A process or construction in which some proposition is said to be false. Negation involves the use of some negative item such as *not*, *n’t*, *nobody*, *nothing*, *never*, etc. - though most discussions of negation in English tend to be about the negative adverbs *not/n’t*. See §4.7.

**Negative evidence:** In the context of discussions about the nature of the evidence which children make use of in acquiring their native language(s), this term relates to evidence based on the nonoccurrence of certain structures in the child’s speech input, or on correction of children by others (e.g. adults). See §1.8.

**Negative Particle:** This term typically denotes the negative adverbs *not/n’t*.

**NEGP:** See NEG.

**Neuter:** See Gender.

**Neutralise/Neutralisation:** When a grammatical contrast (e.g. that between a singular noun like *cat* and a plural noun like *cats*) is not marked in some expression (e.g. the singular/plural noun form *sheep*), the contrast is said to have been neutralised or *syncretised* (in the relevant expression).

**N-movement:** Movement of a noun to a higher position within a nominal expression. See §4.9.

**Node:** A term used to denote each point in a tree diagram which carries a category label. Each node represents a separate constituent in the relevant structure.

**Nom:** An abbreviation for nominative. See Case.

**Nominal:** This is the adjective associated with the word *noun*, so that in principle a nominal (expression) is an expression containing a noun. However, the term is sometimes extended to mean ‘expression containing a noun or pronoun’.
Nominalisation/Nominalising: Nominalisation is a process by which some other type of expression is converted into a nominal (i.e. noun expression). For example, -ness is a nominalising (i.e. noun-forming) suffix in that if we suffix -ness to an adjective like sad, we form the noun sadness.

Nominative: See Case

Nonargument: See Argument

Nonauxiliary Verb: A ‘lexical verb’ or ‘main verb’ (like want, try, hate, smell, buy etc.) which requires do-support to form questions, negatives and tags.

Nonconstituent: A nonconstituent string is a sequence of words which do not together form a constituent.

Noncount noun: See Count noun.

No-negative-evidence hypothesis: The hypothesis that children acquire their native language(s) on the basis of positive evidence alone, and do not make use of negative evidence. See §1.8.

Nonfinite: See Finite.

Nonterminal: See Terminal.

Noun: A category of word (whose members include items such as boyfriend/thought/sadness/computer) which typically denotes an entity of some kind. In traditional grammar, a distinction is drawn between common nouns and proper nouns. Proper nouns are names of individual people (e.g. Chomsky), places (e.g. Colchester, Essex, England), dates (e.g. Tuesday, February, Easter), magazines (e.g. Cosmopolitan) etc., whereas common nouns (e.g. boy, table, syntax etc.) are nouns denoting general (non-individual) entities. Proper nouns have the semantic property of having unique reference, and the syntactic property that (unless themselves modified) they generally can’t be modified by a determiner (cf. *the London).

Noun Phrase/NP: A phrase whose head is a noun. In work prior to the mid 1980s, a structure such as the king of Utopia was taken to be a noun phrase/NP comprising the head noun king, its complement of Utopia and its specifier the. In more recent work, such expressions are taken to be Determiner Phrases/DPs comprising the head determiner the and a noun phrase/NP complement king of Utopia, with the NP in turn comprising the head noun king and its complement of Utopia. See §2.3 and §3.10.

NP: See Noun Phrase.

N-pronoun: A pronoun like one in ‘Mary bought a green one’ which has the morphological and distributional properties of a (count) noun.

Null: A null constituent is one which is silent or unpronounced and so has no overt phonetic form. See ch.3.

Null case: The case carried by PRO (See Case).

Null subject: A subject which has grammatical and semantic properties but no overt phonetic form. There are a variety of different types of null subject, including the null pro subject which can be used in any finite clause in a language like Italian, the null counterpart of you found in English imperative clauses like ‘Shut the door!’ , the null PRO subject found in non-finite control clauses like that bracketed in ‘The prisoners tried [PRO to escape]’, and the null truncated subject found in sentences like ‘Can’t find my pen. Must be on my desk at home’. See §3.2.

Null subject language: This term is used to denote a language which allows any finite clause of any kind to have a null pro subject. For example, Italian is a null subject language and so allows us to say ‘Sei simpatica’ (literally ‘Are nice’, meaning ‘You are nice’); by contrast, English is a non-null subject language in the sense that it doesn’t allow the subject to be omitted in this type of structure (Hence *‘Are nice’ is ungrammatical in English).

Null subject parameter: A parameter whose setting determines whether a language is a null subject language or not. See §1.6.

Num: An abbreviation for the feature Number. In a different (but related) use, a category label denoting a particular head which is claimed by some to be the locus of number properties in noun expressions. It may
correspond to the position which a noun like *invasione* ‘invasion’ moves to in an Italian nominal such as *la grande invasione italiana dell’Albania* (literally ‘The great invasion Italian of the Albania’, and more idiomatically ‘the great Italian invasion of Albania’). A Phrase headed by a Num constituent is labelled NumP ‘Number Phrase’. See §4.9.

**Number**: A term used to denote the contrast between singular and plural forms. In English, we find number contrasts in nouns (cf. ‘one dog’, ‘two dogs’), in some determiners (cf. ‘this book’, ‘these books’), in pronouns (cf. *thi*/*they*), and in finite (auxiliary or main) verbs (cf. ‘It smells’, ‘They smell’).

**Object**: The complement of a transitive item (e.g. in ‘Help me’, *me* is the object of the transitive verb *help*; and in ‘for me’, *me* is the object of the transitive preposition *for*). The term *object* is generally restricted to complements which carry accusative case - i.e. to nominal or pronominal complements: hence, *nothing* would be the object (and complement) of *said* in ‘He said *nothing*’, but the *that*-clause would be the *complement* (but not the object) of *said* in ‘He said [that he was tired]’ - though some traditional grammars extend the term *object* to cover clausal complements as well as (pro)nominal complements. In sentences such as ‘She gave him them’, the verb *give* is traditionally said to have two objects, namely *him* and *them*: the first object (representing the recipient) is termed the *indirect object*, and the second object (representing the gift) is termed the *direct object*: the relevant construction is known as the *double object construction*. Where a verb has a single object (e.g. *nothing* in ‘He said *nothing*’), this is the direct object of the relevant verb.

**Objective**: Another term for *accusative*. See *Case*.

**One-place predicate**: A predicate which has only one argument. See *Argument*.

**Operator**: This term is used in syntax to denote (e.g.) interrogative and negative expressions which have the syntactic properties that they trigger auxiliary inversion (cf. ‘What have you done?’, ‘Nothing have I done’) and allow a polarity item like partitive/existential *any* to occur in their scope (cf. ‘What can anyone do?’ ‘Nothing can anyone do’).

**Orphaned**: See *Stranded*.

**Overt**: An expression is overt if it has a non-null phonetic form, but *null* if it has no phonetic content. Thus, *him* is an overt pronoun, but *PRO* is a null pronoun. The term *overt structure* is used in this book (though not more generally) as an informal expository term to refer to a simplified representation of the structure of a given expression which shows only the overt constituents which it contains (and hence excludes trace copies and other null constituents).

**P**: See *Preposition*.

**Paraphrase**: A paraphrase is an expression which has roughly the same meaning as the expression which it is being used to paraphrase, but which brings out the relevant meaning more clearly. For example, we can bring out the ambiguity of a sentence like *He loves you more than me* by saying that it has two different interpretations, one of which can be paraphrased as ‘He loves you more than he loves me’, and the other of which can be paraphrased as ‘He loves you more than I love you’.

**Parameters**: Dimensions of grammatical variation between different languages or different language varieties (e.g. the *Null Subject Parameter, Head Position Parameter, Wh-Parameter*). See §1.6.

**Parameter-setting**: The process by which children determine which setting of a parameter is appropriate for the native language they are acquiring. See §1.7.

**Partial**: A labelled bracketing is partial if it shows only part of the structure of a given sentence or expression (other parts being omitted to simplify exposition).

**Participle**: A non-finite verb form which encodes *aspect* or *voice*. In European languages, participles have no person properties but (in languages like Latin or Icelandic which have a richer morphology than English) have number/gender/case properties. English has three types of participle: *progressive participles* (ending in *-ing*) used in conjunction with the progressive aspect auxiliary *be* in sentences like ‘It is raining’; *perfect participles* (generally ending in *–d* or *–n*) used in conjunction with the perfect aspect auxiliary *have* in sentences like ‘He has gone home’; and *passive participles* (also generally
ending in –d or –n) used in conjunction with the passive voice auxiliary be in sentences like ‘He was arrested by Percy Plodd’.

**Particle:** This is an informal term used to describe a range of (typically monosyllabic) items which are invariable in form, and which don’t fit easily into traditional systems of grammatical categories. For example, infinitival to (cf. ‘Try to be nice’) is said to be an infinitive particle; of as used in expressions like ‘loss of face’ is sometimes said to be a genitive case particle; not and n’t are said to be negative particles. The term is sometimes extended to include prepositions used without a complement (e.g. down in ‘He fell down’).

**Partitive:** A partitive quantifier is a word like some/any which quantifies over part of the members of a given set (as in ‘Some students enjoy syntax’).

**Part of speech:** See Category.

**Passive:** see Active; see also Passivisation.

**Passive participle:** See Active, Participle.

**Passivisation:** A movement operation whereby an expression which is the thematic complement of a verb becomes the subject of the same clause (as in ‘The jewels were stolen’) or the subject of another clause (as in ‘The minister was said to have lied to Parliament’). See §6.6-§6.7.

**Past tense:** See Tense.

**PATIENT:** A particular type of theta role, denoting an entity which suffers the consequences of some action. For example, in a sentence such as ‘John killed Harry’, Harry is the patient argument of the verb kill. The more recent term THEME is often used in place of the traditional term PATIENT. See §6.5.

**PERF:** Perfect aspect auxiliary (e.g. have in ‘He may have left’). See Aspect.

**Perfect:** In one sense of the word, in a sentence like ‘He has gone home’, has is an auxiliary marking perfect aspect, and gone is a perfect participle: see Aspect, Participle. In a different sense, by claiming that language is a perfect system, Chomsky means that grammars produce structures which are ‘perfect’ in the sense that they are precisely of the form required to interface with speech and thought systems.

**Performance:** A term which denotes observed language behaviour – e.g. the kind of things people actually say when they speak a language, and what meanings they assign to sentences produced by themselves or other people. Performance can be impaired by factors such as tiredness or drunkenness, giving rise to performance errors. Performance is contrasted with competence (which denotes fluent native speakers’ knowledge of the grammar of their native language). See §1.3.

**PERFP:** Phrase headed by a perfect aspect auxiliary like have.

**Periphery:** The periphery of a clause is that part of the clause structure which is positioned above TP – in other words the edge of CP (or its counterpart in a split CP system like that discussed in §8.2-§8.3).

**Pers:** An abbreviation of Person.

**Person:** In traditional grammar, English is said to have three grammatical persons. A first person expression (e.g. I/we) is one whose reference includes the speaker(s); a second person expression (e.g. you) is one which excludes the speaker(s) but includes the addressee(s) (i.e. the person or people being spoken to); a third person expression (e.g. he/she/it/they) is one whose reference excludes both the speaker(s) and the addressee(s) - i.e. an expression which refers to someone or something other than the speaker(s) or addressee(s).

**Personal pronouns:** These are pronouns which carry inherent person properties - i.e. first pronouns such as I/we, second person pronouns such as you, and third person pronouns such as he/she/it/they. See person.

**PF(-representation):** (A representation of the) Phonetic Form (of an expression). See Representation. The PF-component of a grammar is the component which converts the syntactic structures generated by the computational component of the grammar into PF-representations, via a series of morphological and
phonological operations. A **PF-clitic** is a clitic which attaches to another item in the PF-component (not in the syntax), so that the two form a single phonetic word, but are not a single word in the syntax.

**P-feature**: A feature (e.g. a topic-, focus- or wh-feature) which attracts a constituent to move to the **periphery** of a clause.

**Phase**: In work outlined in chapter 9, Chomsky argues that syntactic structures are build up in phases (phases including complementiser phrases and transitive verb phrases), and that once a phase has been produced, the domain/complement of the head of the phase undergoes **transfer** to the PF component and the semantic component, and thereby becomes impenetrable to further operations in the syntax.

**Phase Impenetrability Condition**: A **constraint** on grammatical operations which specifies that the domain/complement of a phase head is impenetrable/inaccessible to an external probe (i.e. to a c-commanding probe which lies outside relevant phase). See §9.2.

**Phi-features/φ-features**: Person and number features (and, in languages which have grammatical gender, gender features as well).

**Phonetic representation**: See **Representation**.

**Phonological features**: Features used to describe sound properties. For example, the difference between nasal and oral sounds might be described in terms of the feature [±NASAL].

**Phrase**: The term **phrase** is used to denote an expression larger than a word which is a **maximal projection**: see **Projection**. In traditional grammar, the term refers strictly to non-clausal expressions (Hence, ‘reading a book’ is a phrase, but ‘He is reading a book’ is a clause, not a phrase). However, in more recent work, **clauses** are analysed as types of phrases: e.g. ‘He will resign’ is a tense phrase (TP), and ‘That he will resign’ is a complementiser phrase (CP). See §2.3 and §2.4.

**Phrase-marker**: A tree diagram used to represent the syntactic structure of a phrase or sentence. See §2.6.

**Phrase structure**: See **Constituent structure**.

**PIC**: See **Phase Impenetrability Condition**.

**Pied-Piping**: A process by which a moved constituent drags one or more other constituents along with it when it moves. For example, if we compare a sentence like ‘Who were you talking to?’ with ‘To whom were you talking?’, we can say that in both cases the pronoun **who** is moved to the front of the sentence, but that in the second sentence the preposition to is **pied-piped** along with the pronoun **who**. See §5.5.

**PITMH**: See **Predicate-Internal Theta-Marking Hypothesis**. See §6.4.

**PL**: See **Plural**.

**Plural**: A plural expression is one which denotes more than one entity (e.g. *these cars* is a plural expression, whereas *this car* is a **singular** expression).

**P-marker**: See **Phrase-marker**.

**Polarity expression**: A word or phrase (e.g. a word like *ever* or a phrase like *at all or care a damn*) which has an inherent **affective** polarity, and hence is restricted to occurring within the scope of an affective (e.g. negative, interrogative or conditional) constituent. See **affective**.

**Positive evidence**: In discussions of child language acquisition, this expression denotes evidence based on the actual occurrence of certain types of structure in the child’s speech input. For example, hearing an adult say *Open it* gives a child **positive evidence** that verbs are canonically positioned before their complements in English See §1.8.

**Possessive**: A possessive structure is one which indicates possession: the term is most commonly used in relation to expressions like ‘John’s book’ or ‘his book’ (where the italicised expressions denote the person who possesses the book). The italicised possessor in each structure is said to be **genitive in case**.

**Postposition**: A type of word which is the counterpart of a **preposition** in languages which position prepositions after their complements. See **Adposition**.
**Postulate:** A postulate is a theoretical assumption or hypothesis; to postulate is to hypothesise.

**PP:** See **Prepositional Phrase**.

**PPT:** See **Principles and Parameters Theory**.

**Pragmatics:** The study of how nonlinguistic knowledge is integrated with linguistic knowledge in our use of language.

**Pr:** An abbreviation for the feature [present-tense]. See **Tense**.

**Precede(nce):** To say that one constituent precedes another is to say that it is positioned to its left (on the printed page) and that neither constituent contains the other. **Precedence** is left-to-right linear ordering.

**Preclausal:** A preclausal expression is one which is positioned in front of a clause.

**Predicate:** See **Argument**, **Predicative**.

**Predicate-Internal Theta-Marking Hypothesis:** The hypothesis that an argument is assigned a theta-role via merger with a predicate. See §6.4.

**Predication:** The process by which a predicate is combined with a subject in order to form a proposition. For example, in a sentence such as ‘Boris likes vodka’, the property of liking vodka is said to be predicated of Boris.

**Predicative:** In structures such as ‘John is in Paris/very silly/a liar’, the italicised expressions are said to be predicative in that they predicate the property of being in Paris/being very silly/being a liar of John (i.e. they attribute the relevant property to John). A nominal like a liar when used predicatively is also referred to as a **predicate nominal**.

**Prefix:** See **Affix**.

**Prenominal:** A prenominal expression is one which is positioned in front of a noun expression. For example, both a and red are prenominal in an expression such as a red car.

**Preposing:** An informal term to indicate a movement operation by which a constituent is moved further to the left within a phrase or sentence.

**Preposition:** A preposition is a word generally used to express location, manner, etc. - e.g. at/in/on/under/ by/with/from/against/down etc. In English, it is a characteristic property of prepositions that they are invariable, and that they can generally be modified by straight/right. Where a preposition has a nominal or pronominal complement, it is said to be **transitive**; where it has no complement, it is said to be **intransitive**. Hence down is a transitive preposition in ‘He fell down the stairs, but an intransitive preposition in ‘He fell down’.

**Prepositional Phrase:** A phrase whose head is a preposition - e.g. in town, on Sunday, to the market, for someone else, etc.

**Preposition stranding:** See **Stranding**.

**Pres/Present tense:** See **Tense**.

**Principles:** **Principles of Universal Grammar/UG principles** describe potentially universal properties of natural language grammars: the terms condition and constraint are also used with much the same meaning as the term principle. Potential principles of Universal Grammar include the **Headedness Principle**, **Binary Principle**, **Attract Closest Principle** and **Phase Impenetrability Principle**.

**Principles-and-Parameters Theory:** This theory, developed in Chomsky (1981) and much subsequent work, claims that natural language grammars incorporate not only a set of innate universal principles which account for those aspects of grammar which are common to all languages, but also a set of parameters which account for those aspects of grammar which vary from one language to another. See **Principles** and **Parameters**.

**PRN:** An abbreviation for **Pronoun**.
PRO: A null-case pronoun (known informally as ‘big PRO’, because it is written in capital letters) which represents the understood subject of an infinitive complement of a control predicate, e.g. in a structure such as ‘John decided PRO to leave’. See §3.2.

pro: A null nominative-case pronoun (known informally as ‘little pro’, because it is written in lower-case letters) which represents the understood null subject of a finite clause in a null subject language. A Shakespearean sentence such as ‘Wilt come?’ (= ‘Will you come?’, Stephano, The Tempest, III.ii) could be argued to have a null pro subject, and hence to have the structure ‘Wilt pro come?’, with pro having essentially the same interpretation as the second person singular pronoun thou. See §3.2.

Probe: When a head is merged with its complement, it serves as a probe which searches for a matching goal within its complement (i.e. an expression which it can agree with). See §7.2.

Proform: A proform is an expression (typically a word) which has no specific content of its own, but which derives its content from an antecedent. For example, in a sentence such as ‘Mary may have been tired, but she didn’t seem so’, the antecedent of the word so is the adjective tired: hence so (in the use illustrated here) can be said to be an adjectival proform.

PROG: Progressive aspect auxiliary (e.g. be in ‘He may be waiting for you’). See Aspect.

Progressive: See Aspect.

PROGP: Progressive phrase - i.e. a phrase headed by a PROG/progressive auxiliary constituent – e.g. be waiting for you in ‘He may be waiting for you’.

Projection: A projection is a constituent containing a head word. For example, a noun phrase such as students of Linguistics is a projection of its head noun students (equivalently, we can say that the noun students here projects into the noun phrase students of linguistics). A minimal projection is a constituent which is not a projection of some other constituent: hence, heads (i.e. words) are minimal projections. An intermediate projection is a constituent which is larger than a word, but smaller than a phrase (e.g. is working in ‘He is working’). A maximal projection is a constituent which is not contained within any larger constituent with the same head. So, for example, in a sentence like ‘I’ve heard several accounts of what happened’, the italicised noun phrase expression accounts of what happened is a maximal projection, since it is a projection of the noun accounts but is not contained within any larger projection of the noun accounts (if we assume that several accounts of what happened is a quantifier phrase headed by the quantifier several). By contrast, in a sentence such as ‘I’ve heard several accounts’, the italicised noun accounts is both a minimal projection (by virtue of the fact that it is not a projection of some other head) and a maximal projection (by virtue of the fact that it is not contained within any larger structure which has the same head noun). The Projection Principle is a UG principle suggested in earlier work by Chomsky (1981, p.29) which requires that the properties of lexical items should remain constant throughout the derivation: a related principle is the Inclusiveness Condition.

Pronominal: A pronominal (expression) is a non-anaphoric pronoun like him which obeys Principle B of Binding Theory (and hence must not refer to any higher expression within the closest TP most immediately containing it). See Ex.2.2.

Pronoun: The word pronoun is composed of the two morphemes - namely pro (meaning ‘on behalf of’) and noun: hence, a pronoun is traditionally said to be a word used in place of a noun expression. Pronouns differ from nouns in that they have no intrinsic descriptive content, and so are functors. There are a range of different types of pronoun found in English, including the pronominal noun one(s) used in sentences like ‘I’ll take the red one(s)’, pronominal quantifiers like any in ‘I couldn’t find any’, and pronominal determiners like this in ‘This is hard’. The term pronoun is most frequently used to indicate a class of items (like he/him/his) traditionally referred to as personal pronouns (though analysed in much recent work as pronominal determiners).

Proper noun: See Noun.

Proposition: This is a term used to describe the semantic content (i.e. meaning) of a sentence. For example, we might say that the sentence ‘Does John smoke?’ questions the truth of the proposition that ‘John smokes’.
**Pseudocleft sentence**: A sentence such as ‘What he hated most was syntax’, where syntax is said to occupy focus position within the overall sentence.

**Q**: In one use, an abbreviation for quantifier; in another use, an abbreviation for question particle.

**Quantifier**: A quantifier is a special type of determiner used to denote quantity. Typical quantifiers include the universal quantifiers all/both, the distributive quantifiers each/every, the existential/partitive quantifiers some/any, etc.

**Quantifier floating**: See Floating quantifier.

**QP/Quantifier Phrase**: A phrase whose head is a quantifier - e.g. an expression such as many people, or few of the students.

**Q-pronoun**: A pronoun like many in ‘I don’t eat many’ which seems to be a pronominal quantifier.

**Question**: This refers to a type of sentence which is used to ask whether something is true, or to ask about the identity of some entity. See Yes-no question and Wh-question.

**Question operator**: The analysis of yes-no questions presented in §5.8 suggests that they contain a null interrogative operator (i.e. a null counterpart of whether).

**Quirky case**: See Case.

**Raising (predicate)**: The term raising is used in two senses. In its most general sense, it denotes any movement operation which involves moving some constituent from a ‘lower’ to a ‘higher’ position in a structure. However, it also has a more specific sense, indicating a particular kind of movement operation by which an expression is moved from being the subject of one clause to becoming the subject of another. The term raising predicate denotes a word like seem whose subject is raised out of subject position in a complement clause to become subject of the (TP constituent in the) seem clause. See §6.8 and §6.9.

**Reciprocal**: See Anaphor.

**Reduced**: a reduced form is a form of a word which has lost one or more of its segments (i.e. vowel/consonants), and/or which contains a vowel which loses its defining characteristics and is realised as a neutral vowel like schwa /ə/. For example, the auxiliary have has the full (unreduced) form /hæv/ when stressed, but has the various reduced forms /həv/, /əv/ and /ə/ when unstressed.

**Reference/Referential/Referring**: The reference of an expression is the entity (e.g. object, concept, state of affairs) in the external world to which it refers. A referential/referencing expression is one which refers to such an entity; conversely, a nonreferential expression is one which does not refer to any such entity. For example the second there in a sentence such as ‘There was nobody there’ is referential (it can be paraphrased as ‘in that place’), whereas the first there is nonreferential and so cannot have its reference questioned by where? (cf. *Where was nobody there?).

**Reflexive**: See Anaphor.

**Relative pronoun/relative clause**: In a sentence such as ‘He’s someone [who you can trust]’, the bracketed clause is said to be a relative clause because it ‘relates to’ (i.e. modifies, or restricts the reference of) the pronoun someone. The pronoun who which introduces the clause is said to be a relative pronoun, since it ‘relates to’ the expression someone (in the sense that someone is the antecedent of who). See §5.10.

**Representation**: A syntactic representation (or structural representation) is a notation/device (typically, a tree diagram or labelled bracketing) used to represent the syntactic structure of an expression: a semantic representation is a representation of linguistic aspects of the meaning of an expression; a PF-representation is a representation of the phonetic form of an expression.

**Restrictive**: A restrictive theory is one which imposes strong constraints on the types of structures and operations found in natural language grammars. See §1.3.

**Resultative**: A verb such as paint in a sentence such as ‘John painted his house pink’ is said to be a resultative verb in that the result of the action of painting is that the house becomes pink. See §8.4.
**R-expression**: A referring expression comprising or containing a noun, like *John* or *the man next door*. See ex.2.2.

**Root**: The root of a tree diagram is the topmost node in the tree. Hence, a **root clause** is a free-standing clause, i.e. a clause which is not contained within any other expression. In traditional grammar, a root clause is termed a **principal clause**, **independent clause** or **main clause**. By contrast, an **embedded clause** is a clause which is contained within some larger expression; and a **complement clause** is an (embedded) clause which is used as the complement of some item. So, in a sentence such as ‘I think he loves you’, the *think* clause (i.e. the expression *I think he loves you*) is a root clause, whereas the *loves* clause (i.e. the expression *he loves you*) is an embedded clause. Moreover, the *loves* clause is also a complement clause, since it serves as the complement of the verb *think*.

**S/S'*/S-bar**: Category label used in work in the 1960s and 1970s to designate a **sentence** or **clause**. See §2.3 and §2.4.

**Scope**: The scope of an expression is the set of constituents which it modifies or which fall within (what we might informally call) its ‘sphere of influence’. For example, a sentence like *He cannot be telling the truth* has a meaning paraphrasable as ‘It is not possible that he is telling the truth’, and in such a sentence the negative *not* is said to have scope over the modal auxiliary *can* (and conversely *can* is said to fall within the scope of *not*, or to have **narrow scope** with respect to *not*). By contrast, a sentence such as *You mustn’t tell lies* has a meaning paraphrasable as ‘It is necessary that you not tell lies’, and in such a sentence, the auxiliary *must* is said to have scope over (or to have **wide scope** with respect to) the negative particle *n’t*.

**SCP**: See **Strict Cyclicality Principle**.

**Second person**: See **Person**.

**Select(ion)/Selectional**: When a word has a particular type of complement, it is said to **select** (i.e. ‘take’ or ‘allow’) the relevant type of complement (and the relevant phenomenon is referred to as **complement-selection**). For example, we can say that the word *expect* has the **selectional property** that it can select an infinitive complement (e.g. in structures like ‘They expect to win’).

**Semantics/Semantic component**: Semantics is the study of linguistic aspects of meaning. The **semantic component** of a grammar is the component which maps syntactic structures into semantic representations. See **Representation**.

**Sentence**: This term is usually used to denote a **root clause** - i.e. a free-standing clause which is not contained within some larger expression. See **Root**.

**Sentence fragment**: See **Fragment**.

**SG**: An abbreviation for **singular**.

**Shakespeare**: Shakespeare’s plays were written between (around) 1590 and 1620, and are examples of **Early Modern English/Elizabethan English** (though some have suggested that Shakespeare’s English is rather conservative, and hence is more representative of a slightly earlier stage of English).

**Shell**: This term is used in connection with the idea (discussed in §8.3-§8.8) that verb phrases comprise two different projections, an outer vP shell headed by a **light verb**, and an inner VP core headed by a **lexical verb**.

**Silent**: See **Null**.

**Simple sentence**: One which contains a single **clause**.

**Singular**: A singular expression is one which denotes a single entity (e.g. *this car* is a **singular** expression, whereas *these cars* is a **plural** expression).

**Sister**: Two nodes are sisters if they have the same mother (i.e. if they are directly merged with each other at some stage of derivation). See §2.6.

**Small clause**: See **Clause**.
**SOURCE**: A term used in the analysis of semantic/thematic roles to denote the entity from which something moves - e.g. the italicised expression in ‘John returned from Paris’. See §6.4.

**Spec**: See *Specifier*. Terms like *spec-CP/spec-TP/spec-VP* (etc.) denote the specifier position within CP/TP/VP (etc.).

**Specification**: The specification of an item is the set of features which it carries.

**Specifier**: The grammatical function fulfilled by certain types of constituent which precede the head of their containing phrase. For example, in a sentence such as ‘John is working’, *John* is superficially the specifier (and subject) of *is working*. In a sentence such as ‘What did John do?’ *what* is superficially the specifier of the CP headed by a C constituent containing the inverted auxiliary *did*. In a phrase such as ‘straight through the window’, *straight* is the specifier of the PP headed by the preposition *through*.

**Specifier-first**: A specifier-first structure is one which has its specifier positioned in front of its head.

**Spellout**: The point in a derivation at which part of a syntactic structure is sent to the PF component to be mapped into a PF-representation (i.e. representation of its phonetic form). To say that an item has a *null spellout* is to say that it is ‘silent’ and so has a null phonetic form.

**Split CP/Split VP**: Work by Luigi Rizzi discussed in §8.2-§8.3 has suggested that CP can be split into a number of distinct projections, including a *Force Phrase*, *Focus Phrase*, *Topic Phrase* and *Finiteness Phrase*. Similarly, work by Larson, Hale and Chomsky outlined in §8.4-§8.9 has suggested that verb phrases can be split into two different projections, an outer vP shell headed by a *light verb*, and an inner VP core headed by a *lexical verb*. On *split spellout*, see *Discontinuous spellout*.

**Stacking**: To say (e.g.) that prenominal adjectives can be stacked in front of a noun is to say that we can have an indefinitely large number of adjectives positioned in front of a noun (e.g. ‘a big, red, juicy, ripe apple’).

**Star**: An asterisk (*) used in front of an expression to indicate that the expression is ungrammatical.

**Stem**: The stem of a word is the form to which inflectional affixes are added. So, a verb form like *going* comprises the stem *go* and the inflectional suffix *-ing*.

**Strand/Stranded/Stranding**: A stranded (or orphaned) preposition is one which has been separated from its complement (by movement of the complement). For example, in an echo question like ‘You’re waiting for who?’, the preposition *for* has not been stranded, since it is immediately followed by its complement *who*. But in ‘Who are you waiting for?’, the preposition *for* has been stranded or orphaned, in that it has been separated from its complement *who*: the relevant phenomenon is termed preposition stranding. The *Stranding Constraint* specifies that in formal styles of English, a preposition cannot be separated from its complement and thereby be stranded.

**Strict Cyclicity Principle**: A UG principle which specifies that a *cyclic* operation can only affect the overall head H of a structure and some other constituent within the structure headed by H. See §4.7.

**String**: A continuous sequence of words contained within the same phrase or sentence. For example, in the sentence ‘They hate syntax’, the sequences *They hate, hate syntax* and *They hate syntax* are all strings - but *They syntax* is not. Note that a string need not be a constituent.

**Strong**: A strong head is one which can attract (i.e. trigger movement of) another head; a *weak* head is one which cannot trigger movement. For example, C in an interrogative main clause is strong in present-day English, and so attracts an auxiliary to move from T to C – e.g. in sentences like *Can you speak French?* On an entirely different use of these terms in the expressions *weak/strong genitive pronoun*, see *Case*.

**Structural**: See *Case, Representation*.

**Structure**: See *Constituent Structure*.

**Stylistic variation**: Variation correlated with stylistic factors. For example, *whom* is used in formal styles and *who* in other styles in sentences like ‘He is someone whom/who I admire greatly’.
Subject: The (superficial structural) subject of a clause is a noun or pronoun expression which is normally positioned between a complementiser and an (auxiliary or nonauxiliary) verb. Syntactic characteristics of subjects include the fact that they can trigger agreement with auxiliaries (as in ‘The president is lying’, where the auxiliary is agrees with the subject the president), and they can be inverted with auxiliaries in main clause questions (as in ‘Is the president lying?’, where the auxiliary is has been inverted with the subject the president).

Subjunctive: In a (formal style) sentence such as ‘The judge ordered that he be detained indefinitely’, the passive auxiliary verb be is traditionally said to be in the subjunctive mood, since although it has exactly the same form as the infinitive form be (e.g. in infinitive structures such as ‘To be or not to be – that is the question’), it has a nominative subject he, and hence is a finite verb form. In present-day spoken English, constructions containing subjunctive verbs are generally avoided, as they are felt to be archaic or excessively formal in style by many speakers. See Mood.

Substantive: A substantive category is a category (like noun, verb, adjective, adverb, preposition) whose members are contentives (i.e. items with idiosyncratic descriptive content).

Substitution: A technique used to determine the category which a given expression belongs to. An expression belongs to a given type of category if it can be substituted (i.e. replaced) in phrases or sentences like that in which it occurs by another expression which clearly belongs to the category in question. For example, we might say that clearer is an adverb in ‘John speaks clearer than you’ because it can be replaced by the adverbial expression more clearly.

Successive-cyclic movement: Movement in a succession of short steps.

Suffix: See Affix.

Superlative: The superlative is a form of an adjective/adverb (typically carrying the suffix -est) used to mark the highest value for a particular property in comparison with others. For example, hardest is the superlative form of hard in ‘John is the hardest worker because he works hardest’.

Syncretise/Syncretism: In work on split CP projections discussed in §8.3, Rizzi has claimed that although Force and Finiteness are projected on separate heads when some (topicalised or focused) constituent intervenes between them, they are syncretised (i.e. collapsed/confounded) into a single head carrying both Force and Finiteness features when no constituent intervenes between them.

Syntactic representation: See Representation.

Syntax: The component of a grammar which determines how words are combined together to form phrases and sentences.

T: A tense-marking constituent containing either a tensed auxiliary, or an abstract tense affix Tns, or a non-finite tense particle like infinitival to. T-to-C movement is movement of an auxiliary or nonauxiliary verb from the head T position of TP into the head C position of CP – as with the italicised inverted auxiliary in ‘Is it raining?’

Taxonomy: A taxonomy is a classificatory system. A taxonomic theory of language is one which classifies constituents into different types.

Tag: A string usually consisting of an auxiliary and a subject pronoun which is ‘tagged’ onto the end of a sentence. Thus, the italicised string is the tag in the following: ‘The president isn’t underestimating his opponents, is he?’, and the overall sentence is known as a tag question/tag sentence.

Tense: Finite auxiliary and main verbs in English show a binary (two-way) tense contrast, traditionally said to be between present tense forms and past tense forms. Thus, in ‘John hates syntax’, hates is a present tense verb form, whereas in ‘John hated syntax’, hated is a past tense verb form (An alternative classification which many linguists prefer is into [±PAST] verb forms, so that hated is [+PAST], and hates [-PAST]). This present/past tense distinction correlates (to some extent) with time-reference, so that (e.g.) past tense verbs typically describe an event taking place in the past, whereas present-tense verbs typically describe an event taking place in the present (or future). However, the correlation is an imperfect one, since e.g. in a sentence such as ‘I might go there tomorrow’, the auxiliary might carries the past tense inflection -t (found on past tense main verbs like left) but does not denote past time.
Tensed: A tensed (auxiliary or nonauxiliary) verb-form is one which carries (present/past) tense - e.g. *is, will, could, hates, went,* etc. By extension, a tensed clause is one containing a tensed auxiliary or main verb. See Tense.

Terminal node: A node at the bottom of a tree.

Ternary: Three-way. For example, person properties might be described in terms of a ternary (three-valued) feature such as [1/2/3-Pers], with first person pronouns like *we* being [1-Pers], second person pronouns like *you* being [2-Pers], and third person pronouns like they being [3-Pers]. A ternary-branching constituent is one which has three daughters.

Thematic: On Thematic role, see Theta-role. On the Thematic Hierarchy which specifies where an argument carrying a given theta-role should be merged, see ex. XVIII.

Theme: The name of a specific theta-role (sometimes also termed PATIENT) representing the entity undergoing the effect of some action (e.g. *Harry* in ‘William teased *Harry*’).

Theory of grammar: A theory which specifies the types of categories, relations, operations and principles found in natural language grammars. See §1.3.

Theta mark/θ-mark: To say that a predicate theta-marks its arguments is to say that it determines the theta role played by its arguments. See §6.4.

Theta-role/θ-role: The semantic role played by an argument in relation to its predicate (e.g. AGENT, THEME, GOAL, etc.). For example, in a sentence like *William teased Harry*, the verb *tease* assigns the θ-role AGENT to its subject *William* and the theta-role THEME to its complement *Harry*. See §6.4.

Theta criterion/θ-criterion: A principle of Universal Grammar which specifies that each argument should bear one and only one theta-role, and that each theta role associated with a given predicate should be assigned to one and only one argument. See §6.4.

Third Person: See Person.

Three-place predicate: A predicate (typically a verb) which takes three arguments - e.g. the verb *give* in ‘John gave Mary something’ (where the three arguments of *give* are *John, Mary* and *something*). See Argument.

Top/Topic/Topicalisation/TopP: In a dialogue such as the following:

SPEAKER A: I’ve been having problems with the Fantasy Syntax seminar

SPEAKER B: *That kind of course*, very few students seem to be able to get their heads round

the italicised expression *that kind of course* can be said to be the topic of the sentence produced by speaker B, in the sense that it refers back to the Fantasy Syntax seminar mentioned by the previous speaker. An expression which represents ‘old’ or ‘familiar’ information in this way is said to be a topic. The movement operation by which the italicised expression moves from being the complement of the preposition *round* to the front of the overall sentence is traditionally termed topicalisation. In work by Luigi Rizzi on split CP projections discussed in §8.2, topic expressions which occur at the beginning of clauses are said to be contained within a TopP ‘Topic Phrase’ projection, headed by an abstract Top (= ‘Topic’) constituent.

TP: Tense projection/Tense phrase - i.e. phrase headed by a tense-marked auxiliary or an abstract tense affix Af. See §2.2-§2.3.

Trace (theory): A trace of a moved constituent is a null copy left behind (as a result of movement) in each position out of which a constituent moves. Trace theory is a theory which posits that moved constituents leave behind a trace copy in each position out of which they move. See §4.3, §5.3 and §6.2.

Transfer: See Phase.

Transitive: A word is traditionally said to be transitive (in a given use) if it assigns accusative case to a noun or pronoun expression which it c-commands. So, *likes* in ‘John *likes* him’ is a transitive verb, since it assigns accusative case to its complement *him*. Likewise, infinitival *for* is a transitive complementiser,
since it assigns accusative case to the subject of its infinitive complement (cf. ‘I’m keen [for him to participate more actively]’). See §3.9.

**Tree (diagram):** A form of graph used to represent the syntactic structure of a phrase or sentence.

**Truncate/Truncation:** Truncation is an operation by which a sentence is shortened by omitting one or more unstressed words at the beginning. For example, we can truncate a question like *Are you going anywhere nice on holiday?* by omitting are to form *You going anywhere nice on holiday?* and can further truncate the sentence by omitting you to give *Going anywhere nice on holiday?*

**T-to-C movement:** See T.

**Two-place predicate:** A predicate which has two arguments – e.g. *tease* in ‘William teased Harry’ where the two arguments of the predicate *tease* are *William and Harry*. See Argument.

**UG:** see Universal Grammar.

**Unaccusative:** An unaccusative predicate is a word like *come* whose apparent ‘subject’ originates as its complement. See §6.5.

**Unary-branching:** A unary-branching node is one which has a single daughter.

**Unbound:** A constituent is unbound if it has no appropriate antecedent in an appropriate position within a given structure. For example, *himself* is unbound in a sentence such as *“She helped himself, since she is not an appropriate antecedent for himself, and there is no other appropriate antecedent for himself anywhere within the sentence."

**Unergative:** An unergative predicate is a verb like *groan* in a sentence such as ‘He was *groaning*’ which has an AGENT subject but no overt object (though may have an incorporated object: see §8.5).

**Ungradable:** See Gradable.

**Ungrammatical:** See Grammatical.

**Uniformity of Theta Assignment Hypothesis/UTAH:** A hypothesis (developed by Baker 1988) which maintains that each theta-role assigned by a particular kind of predicate is canonically associated with a specific syntactic position: e.g. spec-vP is the canonical position associated with an AGENT argument.

**Uninterpretable:** See Interpretable.

**Universal Grammar:** Those aspects of grammar which are universal, and which are assumed by Chomsky to be part of the innate knowledge which a child is born with.

**Universality:** A criterion of adequacy for a theory of grammar, requiring that the theory be applicable to all natural languages. See §1.3.

**Unreduced:** See Reduced.

**Unspecified:** To say that a constituent is unspecified for a given feature is to say that it lacks the relevant feature.

**Unvalued:** See Value.

**UTAH:** See Uniformity of Theta Assignment Hypothesis.

**V:** See Verb.

**v:** See Light verb.

**Value:** In relation to a feature such as [Singular-Number], number is said to be an attribute (and represents the property being described) and singular its value. To value a feature is to assign it a value. For example, a finite auxiliary enters the derivation with its person and number features unvalued (i.e. not assigned any value), and these are then valued via agreement with the subject in the course of the derivation. See §7.3.

**Variety:** A particular (e.g. geographical or social) form of a language.
Verb: A category of word which has the morphological property that it can carry a specific range of inflections (e.g. the verb *show* can carry past tense *-d*, third person singular present tense *-s*, perfect *-n* and progressive *-ing*, giving rise to *shows/showed/shown/showing*), and the syntactic property that it can head the complement of infinitival *to* (cf. ‘Do you want to *show* me?’) On Verb movement, see V-to-T movement.

Verb phrase: a phrase which is headed by a verb - e.g. the italicised phrase in ‘They will *help* you’. See ch.2.

V-to-T movement: Movement of a verb out of the head V position in VP into the head T position in TP. See §4.4.

Vocative: A vocative expression is one which is used to address one or more individuals, and which is set off in a separate tone-group at the beginning or end of the sentence (marked in the spelling by the use of a comma). So, for example, *Fred* is a vocative expression in ‘Fred, can you give me a hand?’ and similarly, *you two* is a vocative expression in ‘Come here, you two!’

Voice: See Active.

VP/VPISH: On VP, see Verb Phrase. A VP-adverb is an adverb (like *perfectly*) which adjoins to a projection of a lexical verb (V). The VP-Internal Subject Hypothesis/VPISH is the hypothesis that subjects originate internally within the verb phrase: see ch.6.

vP: a phrase (maximal projection) headed by a light verb. A vP-adverb is an adverb which adjoins to a projection of a light verb (v).

Weak: See Strong.

Wh: This is widely used as a feature carried by constituents which undergo wh-movement (hence e.g. the relative pronoun *who* in *someone who I think is lying* can be described as a wh-pronoun, as can the interrogative pronoun *who* in *Who are you waiting for?* and the exclamative quantifier *what* in *What fun we had!*

Wh-copying: A phenomenon whereby a moved wh-expression leaves behind an overt copy of itself when it moves – as with movement of *who* in a Child English question such as *Who do you think who chased the cat?*

Wh-expression: an expression containing a wh-word (i.e. containing a word carrying a [WH] feature).

Wh-island constraint: A constraint which specifies that wh-clauses (i.e. clauses beginning with a wh-expression) are islands, so that no constituent can be moved out of a wh-clause. See Island.

Wh-movement: A type of movement operation whereby a wh-expression is moved to the front of a particular type of structure (e.g. to the front of the overall sentence in ‘Where has he gone?’). See ch.5.

Wh-parameter: A parameter whose setting determines whether wh-expressions are (or are not) moved to the front of an appropriate type of clause (e.g. in wh-questions). See §1.6.

Wh-phrase: A phrase containing a wh-word.

Wh-question: A question which contains a wh-word, e.g. ‘What are you doing?’

Wh-word: A word which begins with wh (e.g. *who/what/which/where/when/why*), or which has a similar syntax to wh-words (e.g. *how*).

Word order: The linear sequencing (left-to-right ordering) of words within a phrase or sentence.

Yes-no question: A question to which ‘Yes’ or ‘No’ would be an appropriate answer - e.g. ‘Is it raining?’
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