Noun Phrase in the Generative Perspective

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In memory of Tanya Reinhart

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Preface

Aim of the book

This book is a theoretically oriented, comparative study of the aspects of morphosyntax of what is traditionally called the noun phrase (NP), i.e. the projection of the noun. The goal of the book is to offer a survey of current discussions on a number of key issues that have become prominent in research on the syntax of nominal projections within the generative tradition.

The book is thus primarily intended for linguists interested in some aspect of the structure and morphology of the nominal projection. Although a basic background in the generative tradition is presupposed, any crucial theoretical assumptions adopted in the book will be elaborated at relevant points. Hence the book should be accessible to advanced students as well as to readers who are broadly familiar with generative syntax but who may not be familiar with the precise implementations adopted in the book. As many issues relating to the structure of the nominal domain are also relevant for the analysis of the clause, and since we will often place the discussion against the background of the development of the theory as a whole, the syntactician whose main research interest lies outside the nominal domain will hopefully also find areas of interest in this book.

Syntax of nominal projections and syntax of clauses

All current generative research on the syntax of the nominal projection has been crucially motivated by the emergence of the 'DP-hypothesis', as advanced by the work of Abney (1987). In addition, as in any other area of syntax, research on the nominal projection is obviously also influenced continuously by the theoretical developments within generative grammar. In research into the nominal domain as elaborated during the last twenty years, a number of key areas of interest can be identified; we will briefly introduce these here, though, obviously, the various domains of interest are ultimately related and cannot be kept fully isolated.

The DP hypothesis postulates that, in the same way that the projection of the verb is dominated by functional material, the projection of the noun

is part of a larger functional complex, the DP. One of the central issues with respect to the syntax of DPs arises from the fact that interesting parallelisms can be observed between the nominal domain and the clause, that is, the verbal domain. It is, for instance, tempting to compare the role of the V head in the clausal domain to that of the N head in the nominal domain, and while it is C, the complementiser position, that provides discourse anchoring in the clause, the same role can be argued to be played by D, the determiner, in the nominal domain.

The assumption that what used to be called NP should be reinterpreted in terms of DP, that is a projection of D with a nominal complement, means that the determiner has a central role in the nominal system. This in turn has led to a number of questions concerning the status of the determiner elements found within the DP. In particular, questions have arisen about the position and interpretation of definite and indefinite articles, of demonstrative pronouns and of possessive pronouns in the languages that have them. Equally, given the DP hypothesis and its core assumption that a NP is dominated by a DP, questions arise as to how to analyse nominal projections without an overt determiner.

Another area of study concerns the assumption that in the same way that clauses are basically V projections augmented with functional projections (TP, AGRP, AspP etc), DPs are N projections augmented with functional projections. This leads to obvious questions about the functional layering of the DP: in addition to DP, are there other functional projections, how many such projections are there, how can they be motivated, what are their interpretative properties? Given that functional projections in the clause have been tied in with the availability of morphological markers of Tense, Agreement, Aspect etc, there has also been a renewed interest in the morphological markers of the noun and their relevance for postulating functional projections. Morphological issues related to the status of functional categories include questions concerning the realisation and interpretation of features such as agreement, case, gender (word marker/stem affix/inflection class), in the nominal domain.

In the same way that the syntax of semantics of adverbial modifiers in the VP has given rise to much discussion, the syntactic and semantic relationship of (primarily if not exclusively adjectival) modifiers to the noun has received a lot of attention. This research ties in directly with that concerning the status of functional projections in the NP and the question to what extent the syntax of nominal modifiers (especially adjectives) can be aligned with that of verbal modifiers (especially adverbs). A related question

is also how the relative position of the noun with respect to the modifying adjectives can be derived. For instance, in the same way that some positions of the verb in the clause have been argued to be derived by movement of V to a functional position, it has been argued that the postnominal position of the adjectives is due to N-movement across the adjective. However, the N-movement hypothesis has not gone unchallenged and alternatives have been elaborated. The assumptions that there is a rigid split between lexical categories and functional categories have also come under scrutiny. With respect to the clausal domain there have been proposals that certain verbs belong to hybrid categories with both functional and lexical properties and the same proposals have also been made with respect to the status of certain nouns.

A final area of research is centred on the parallelism between V as the semantic head of the clause and N as the semantic head of the DP. In the same way that lexical verbs have arguments with which they have thematic relations in the clause, nominal heads may also be argued to have arguments, with which they have thematic relations. The assumption that nouns may have arguments seems particularly natural in the case of deverbal nouns. In addition, possessor arguments are also typically found in nominal projections. Assuming there are indeed arguments in the nominal domain, then questions arise also with respect to their distribution, their relation to the structure, in particular whether they have specifier or complement status. It has further been argued that just like clauses (i.e. projections of verbs) instantiate a predication relation, DPs contain evidence for predication relations. This line of enquiry has, among other things, led to new analyses for possessor constructions and for pseudopartitive constructions.

In this book, we want to offer a discussion of the research areas in the domain of the syntax of the nominal projection outlined above, with special attention for the parallelisms between the nominal projection and the clause. In order to achieve this goal we will systematically relate phenomena relevant for the nominal projection to other syntactic phenomena. For instance, the syntax of possessive pronouns in the nominal projection is related to the classification of pronouns which was elaborated to account for their distribution in the clause, N-movement in the nominal domain is compared to V-movement in the clause, the syntax of the genitive construction is related to that of predicate inversion in the clause.

We also want to show how research into the nominal projection is unavoidably determined by developments in the theory. Often, we have at-

tempted to integrate earlier findings on the syntax of nominal projections into newer theoretical proposals, casting new light on the empirical domain at issue. In the various chapters, we will show how recent theoretical proposals (distributed morphology, anti-symmetry, minimalism, cartography) can cast light on aspects of the syntax of the DP and can enrich and refine earlier analyses. We also indicate problems with the analyses that have been proposed, whether they be inherent to the theories as such (e.g. what is the trigger for movement in antisymmetric approaches) or to the particular instantiations. In the discussion of various issues, we apply the framework that is most adequate to deal with problems at hand. We therefore do not use the same theoretical approach throughout the book. As a consequence, at various points in the book we will provide a brief introduction to theoretical proposals which we adopt at that point.

We wish to underline that our book does not aim at providing the definitive analysis of the syntax of noun phrases. We consider that this would not be possible, given the current flux in generative syntax, with many new theoretical proposals being developed and explored in parallel. Our goal is to give the reader the background for research and to show how a number of quite different proposals in the literature have been be applied in an interesting way to the nominal domain. When relevant, we will point to remaining issues for further research. We also point out that, while we have aimed at covering a wide range of areas, the book is not an exhaustive survey of the vast literature on noun phrases. And though proposals in the literature will be discussed when relevant, our aim is not to provide a critical survey of the literature. We feel that such a critical approach to the literature would be guided by general theoretical choices rather than by issues specific to the syntax of nominal constructions, which is the focus of our book. Whenever we introduce proposals from the literature our goal is to use them to cast light on the phenomena discussed.

Organization of the book

The book has four parts, each composed of a number of chapters. **Part I** is a general introduction. **Part II** is concerned with the functional make up of the nominal projection. **Part III** deals with DP internal modification relations. **Part IV** is concerned with the relation between a head N and other DPs within the nominal projection.

Though there are obviously relations between the three parts of the book, and between the various chapters, we have tried to make the main parts as

well as the chapters in them relatively freestanding. Each deals with one specific aspect of the syntax of nominals and can be read on its own.

The book is comparative in its approach: as is standard practice in generative grammar, data from different languages will be examined, including English, and the Germanic languages, the Romance languages, Slavic languages, Semitic languages and modern Greek. We do not systematically examine each of the languages discussed for all of the properties at stake, but rather we will introduce data from those languages that seem particularly telling for the point at issue.

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Part I

Introduction

This book is a theoretically oriented, comparative study of some aspects of the morphosyntax of constituents that have been traditionally referred to as noun phrases. The core empirical data addressed here are fairly straightforward. In the following examples the underlined strings are all noun phrases of one type or another.

(1) a. *Henry* is hungry.
  b. There is *a grey cat* waiting outside.
  c. *The cat* probably wants to come in.
  d. *All our cats* are very independent.
  e. *This big grey cat in the corner* is *Nelson*.
  f. *The cat's tail* was moving energetically.
  g. *Rembrandt's picture of Lulu* was very detailed.
  h. *Cats* are *wonderful creatures*.
  i. *Topsy* loves *fresh cream*.

The semantic nucleus of the underlined constituents is a noun which may be accompanied by other constituents of various categories. (2) provides a very preliminary inventory of some of the components of the underlined constituents in (1) with provisional category labels.

(2) Noun (N)   proper name   *Lulu, Henry, Nelson, Rembrandt, Topsy*

common noun *cat, corner, creature, cream, picture, tail,*

Adjective (A) *fresh, grey, wonderful*

Determiner (D) definite *the*

indefinite *a*

Demonstrative (Dem) *this*

Quantifier *all*

In this book we will be concerned with the distribution and function of the components of nominal projections and with the various relations between the noun and the other constituents in its projection. As a shorthand term the labels Noun Phrase or NP are often used to refer to constituents headed by a noun but, though there is indeed a need for this label to designate the (lexical) projection of N, we will see that technically the underlined constituents in (1) are more than projections of N, i.e. NPs. Following current tradition in the generative framework (see Abney 1987) we will usually refer to constituents such as those underlined in (1) as DPs.

The present chapter is an introduction to the book. We provide a survey of some of the major areas of research in the domain of nominal syntax. One prominent starting point of much research on the nominal projection revolves around the similarities and differences between nominal syntax and verbal syntax. To put it simply, comparisons are made between noun phrases and sentences. As will be shown below, the way this issue is addressed is not independent of theoretical considerations.

In the introduction we provide first a discussion of the way in which the nominal constituents seems to have certain properties in common with clauses. These observations will be a basis for the remainder of the book, in that we will examine to what extent proposals for the analysis of the clause can be carried over to the analysis of the nominal constituent. In the second section of the chapter we introduce the central theoretical concepts which will be used in the book. This section is an introduction to some basic concepts in syntactic literature. Readers familiar with the theoretical models used here, namely the Government and Binding model, the Principles and Parameters model and the recent Minimalist model, will not find much new here and they can skip section 2 of the introduction.

1.   Some parallelisms between clauses and nominal projections

1.1. Subjects and genitives

Many discussions concerning constituents headed by nouns will point out, among other things, that in English the prenominal genitive seems to be to the noun phrase what the subject is to the clause. This is especially clear in the case of nominalizations. For instance, just as *Caesar* is the Agent of the action denoted by *destroy* in (3a), it could be argued that the genitive *Caesar's* in (3b) denotes the Agent of the action expressed by *destruction*.

(3) a. Caesar destroyed the city.
     b. Caesar's destruction of the city

Similarly, just as in (3c) what was the object of *destroy* has become the subject due to passivization, in (3d) the Theme argument of *destruction* in (3b) is now expressed by the genitive in (3d), suggesting that nominal projections, too, allow for argument changing, just like sentences do.

(3) c. The city was destroyed by Caesar.
     d. the city's destruction by Caesar

Finally, just as in (3e) the subject *Caesar* is the antecedent of the reflexive *himself* and cannot be the antecedent of the pronoun *him,* in (3f) the genitive *Caesar's* is the antecedent of *himself* and cannot be the antecedent of *him*:

(3) e. Caesar described himself to him.
     f. Caesar's description of himself to him

These various subject-like properties of genitives may be taken as support for postulating a large degree of parallelism between the syntax of noun phrases and that of clauses. In generative approaches to syntax, this particular issue has been on the agenda at least since Chomsky (1970), who focused on the relation between clauses and the related nominalizations. One specific question that arises is whether nominals such as those in (3b), (3d) and (3f) can inherit the argument structure of the verbs they are derived from, and if so, how this is achieved.

1.2. Functional structure: the DP hypothesis

The semantic nucleus of the clause is the verb, the semantic nucleus of the nominal projection is the noun. In the same way that a clause can be shown to be more than a mere projection of a verb, it has been argued that the so-called Noun Phrase is more than the mere projection of a nominal head. Clauses are extended projections (in the sense of Grimshaw 1991) of the verb: the lexical projection, VP, is dominated by a number of functional projections, such as IP and CP, giving rise to the C-I-V hierarchy (Chomsky 1986b). In a similar way it has been proposed that the nominal projection is dominated by functional projections, the first such projection being Determiner Phrase or DP (Abney 1987; Horrocks & Stavrou 1987; among others).

   Much work in the late 1980s was devoted to establishing the correctness
of the so-called 'DP-hypothesis', i.e. the hypothesis that the determiner
heads the Det+Noun constituent, by bringing cross-linguistic facts to bear
on the issue. Two types of arguments were prominent in the discussion. On
the one hand there were arguments concerning the grammatical and dis-
tributional properties of determiners (e.g. Haider 1988 on German, among
many others). On the other hand, arguments concerning noun movement
can be seen to support postulating at least one functional projection above
NP. If one wishes to postulate that the nominal head moves within the pro-
jection of N one must assume that there is at least one additional head posi-
tion which can receive the moved N. The position of the determiner, D, has
been identified as just such a position. Consider for instance the distribution
of the noun *casa* in the Italian examples in (4) (Longobardi 1994, 1996):

(4)   a. La mia casa è bella.
           The my house is beautiful
       b. Casa mia è bella.
       c. *La casa mia è bella.
       d. *Casa la mia è bella.

In (4a) the definite article *la* precedes the possessive pronoun *mia*. In (4b)
casa precedes *mia* and this order is incompatible with the presence of the
determiner (4c, d). The N-movement argumentation would go as follows:
Leaving aside a detailed analysis of the position of *mia*, one might say that
while in (4a) the noun head occupies the head position of the lexical projec-
tion of N, and D is the head of a functional projection dominating NP, in
(4b) N has moved to the position of the determiner.

(4)   e. $[_{DP} [_{D} casa_n] [mia [_{NP} [_{N} t_n]]]]$

The moved constituent leaves a coindexed trace (t_n) in its original position.
In Minimalist literature, such a coindexed trace has been replaced by a copy
(see section 2.5.2), so (4e) would be equivalent to (4f), where the crossed
out representation ~~casa~~ represents the copy of the moved noun *casa*.[1]

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[1] In this book we will use both the trace symbol (t) and the copy, but without
     these notations implying any theoretical difference. When we use the symbol t
     in a position, for trace, we understand this to mean that the relevant position is
     occupied by a copy of a moved constituent and that this copy is not pronounced.

(4)   f.   [$_{DP}$ [$_D$ casa] [mia [$_{NP}$ [$_N$ ~~casa~~]]]]

For a number of languages, the distribution of the noun with respect to other constituents of the nominal projection has been interpreted in terms of overt raising of N to D (cf. Delsing 1993a, 1998; Taraldsen 1990 on Scandinavian; Ritter 1991 on Hebrew), an instance of head movement within an extended projection paralleling verb movement to I or C. [2] We return to this issue in section 2.3.

1.3. Survey of this book

The DP-hypothesis has achieved a broad consensus, not least since it allows a conceptual unification of syntactic structure across categories. Without the DP-hypothesis, the by now standard view of the extended projection (Grimshaw 1991) as the basic constructional unit in natural language could not have taken hold. Subsequent attempts to improve our understanding of the D-N extended projection have been concerned with four main issues:

(5)   a. the articulation of the D-N extended projection,
       b. the status of arguments in DP,
       c. the status of modifiers in DP,
       d. the effects of head/phrasal movement inside the nominal projection (NP and DP).

The present book offers a survey of some of the literature on the issues listed in (5) The book contains four major parts, which to a large degree can be read independently, though there will obviously be some cross-references. **Part I,** i.e. the current chapter**,** is a general introduction. **Part II** is concerned with the functional make-up of the nominal projection. Chapter 1 of Part II deals with the category D, and will examine both the elements that lexicalize D (in particular, articles and demonstratives) and the semantic categories that D is currently taken to encode (in particular, definiteness and reference). Chapter 2 of Part II surveys some of the various proposals

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   We will often prefer the trace notation to symbolize copies simply because using multiple copies often gets in the way of clarity of presentation and 'readability'.

[2] Longobardi (1994) generalizes the proposal by arguing that N-raising to D occurs covertly elsewhere. We discuss his proposal in chapter 2 of part II. See section 2.1. on covert movement.

that have been advanced in order to account for articleless, or determiner-less, noun phrases. Chapter 3 of Part II is concerned with functional categories within the nominal projection. **Part III** deals with DP-internal modification relations. Chapter 1 of Part III is concerned with adjectival modifiers in the nominal projection. It investigates the factors determining the distribution of adjectives within the nominal projection (NP/DP) and it also examines to what extent a difference in distribution may correlate with a difference in interpretation. Chapter 2 of Part III deals with two constructions that involve so-called semi-functional (or semi-lexical) categories: the N-*of*-N construction and the pseudo-partitive construction. **Part IV** is concerned with the relation between a head N and other DPs within the nominal projection. Chapter 1 of Part IV takes up the issue of arguments in nominals, while Chapter 2 is concerned with the syntax of possession.

Before turning to the individual chapters Section 2 introduces our basic theoretical background for the discussion to follow. Readers who are familiar with generative literature will probably not find any new material in this section. They can proceed immediately to Part II.

2. The theoretical framework

The book has been written against the background of what is usually referred to as generative syntax, the research program initiated by Noam Chomsky in the 1950s. In particular, we shall be assuming the *Principles and Parameters* framework as elaborated in the *Government and Binding* model of the 1980s (see for instance, Haegeman 1994; Radford 1988) and we will also be referring to theoretical proposals drawn from recent work in syntax including (i) the Minimalist Program (Chomsky 1995; Radford 1997, 2004; Adger 2003; Lasnik, Uriagereka, Boeckx 2005), (ii) the anti-symmetry approach to syntax (Kayne 1994), (iii) the Distributed Morphology approach (Halle & Marantz 1993). Since Distributed Morphology will only be relevant for Chapter 1 of Part IV we will not introduce the aspects of the framework relevant for our discussion until section 2.4. of that chapter. In this introductory chapter we will present only the broadest outlines of the first two theories. When relevant, we will elaborate the specific implementations in later chapters as they become relevant for a particular issue or question.

2.1. Levels of representation

A theory of syntax has to assume that language has two basic components, the lexicon, which provides the elementary building blocks of the language, and the syntax, a structure-building system which combines these primitive elements into larger units.

Building on the generative tradition initiated in the 1950s, the *Government and Binding* framework (based on Chomsky 1981) proposes that lexical items are inserted at a particular level of syntactic representation, called D-structure. The syntax operates on this D-structure representation through movement operations, leading to a second level of syntactic representation, called S-structure. S-structure is the basis for both the interpretation of the structure, Logical form (LF), and for its overt realization, Phonetic Form (PF). S-structure results from various movement operations and is reflected in the overt form of the sentence: the moved constituents are displaced. LF is an interpretive level in which non-overt movements may have taken place to encode semantic relations (scope, for instance). It is assumed that any movement that can overtly take place before S-structure may also apply covertly to generate LF-relations.

Thus, we obtain what has been referred to as the T-model of grammar with its three interface levels D-structure, PF and LF. S-structure mediates between these levels. A representation of this model is given in (6a).

(6)   a.
                    (lexicon)
                  D-structure
                  S-structure

           PF   LF
        (sound)   (meaning)
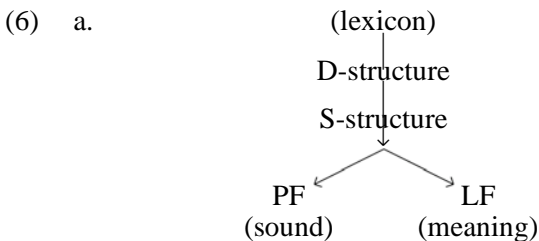
The geometrical relations between the various levels represented in (6a) are not accidental. Specifically, because the path between S-structure and PF is different from the path from S-structure to LF, whatever (movement) operations mediate between S-structure and LF will not affect the phonetic form of a structure. Similarly, manipulations of S-structure which apply on the path to PF will not have any impact on the interpretation (LF).

Let us illustrate this point with a very much simplified example. Consider (7a) and (7b):

(7)   a. John has met Mary
       b. Who has John met?

In (7a) the nominal constituent *Mary* is an argument of the verb *meet*. It occupies the canonical object position. In (7b), on the other hand, the direct object of *meet* is the interrogative pronoun *who*, which does not occupy the canonical object position. However, it is clear that in (7b) too *who* is an argument of *meet*. In order to represent the relation between *meet* and *who* in (7b) we propose that the sentence is derived in two steps: (i) first the object of *meet*, i.e. *who*, is inserted into the VP, and (ii) then undergoes movement to a sentence-initial position. The moved constituent preserves its relation with the original object position, or, to put it differently, in (7b) *who* still counts as the object of *meet*.

   In addition to the interrogative pronoun, the inflected auxiliary *has* also moves to a position to the left of the subject. Again we assume it is inserted into the position in which we find the auxiliary in (7a) and then it moves leftrd. To represent this we use the trace[3] notation. The indices i and j are used to show which trace relates to which moved constituent: t_i is the trace of *who*, t_j is the trace of *has*.

(7)   c. [Who$_i$ has$_j$ [John t$_j$ met t$_i$]]

The question arises why this movement has taken place. Probably the answer must be that to signal interrogative force we need to use the left edge of the clause. We could propose that the left edge of the clause is the area that encodes illocutionary force (among other things). Thus *who* is obliged to move, since, being interrogative, it needs to end up in the layer of the clause that can express interrogative force. On the other hand, not being interrogative, *Mary* has no need to move to that zone. Since there is no reason to move up, the object *Mary* stays where it has been inserted, in the

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[3]   As pointed out above, the trace notation has been replaced by the copy notation in the minimalist literature. Thus (7c) would be represented as (i), where the strikethrough notation is used to indicate the copies of moved constituents:

   (i) [Who has [John ~~has~~ met ~~who~~]]

   In the trace notation, the link between the trace and the moved constituent is indicated by coindexation, as shown in (7c). It is obvious that in the copy notation coindexaion has become superfluous, since from the strikethrough notation it is clear which constituent the copy is related to.

canonical object position. Constituents only move if there is a need for them to move. Or, to put it in technical terms, movement takes place as a last resort.

Now consider the following French examples:

(8) a. Qui as-tu rencontré?
         Who have-you met
         'Who did you meet?'

     b. Tu as rencontré qui?
         You have met whom?
         'Who did you meet?'

In (8a) the same pattern is to be found as in the English counterpart, again the interrogative pronoun and the auxiliary have moved:

(8) c. [qui$_i$ as$_j$ [tu t$_j$ rencontré t$_i$]]

Now consider (8b). This example has the same interpretation as (8a) it is a question about the object.[4] In this example the object has not moved. However, the object is an interrogative pronoun. If interrogative force is interpreted also on the left edge in French, then we must assume that to be fully interpretable *qui* ('who') in (8b) should actually also end up on the left edge. One proposal that has been adopted is that there IS indeed movement of *qui* to the left edge, but this movement only takes place at the interpretative level. Hence the movement will also lead to a structure such as (8c) above, but the movement to derive this structure will not be associated with a visible displacement. Thus (8d) would be the LF representation of (8b):

(8) d. [qui$_i$ as$_j$ [tu t$_j$ rencontré t$_i$]]

The *Minimalist Program* (Chomsky 1993, 1995, 2000, 2001) reconsiders the role of these levels of representation. It is argued that the only conceptually necessary levels of representation are those related to external systems, i.e. the level which is related to the so called articulatory-perceptual

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4   Obviously pairs such as the French examples in (8a) and (8b) pose a problem for the hypothesis that movement is a last resort operation, since the very fact that (8b) is grammatical makes us wonder what could be the motivation for movement in (8a). We will not dwell on this issue here.

system (i.e. the level of 'sound' or PF) and the level which is related to the conceptual-intentional system (i.e. the interpretative level of LF). The levels D-structure and S-structure in (6a) are completely internal to the structure-building system. Since there is no independent direct evidence for their existence, the minimal assumption is that these levels do not exist. Within the Minimalist framework, it is therefore assumed that the only two levels of representation are the interface levels PF and LF. The lexicon is taken to provide the building blocks of the sentence.

The starting point for the construction of a sentence is a set of lexical elements (the so-called *Numeration*). The syntax builds up the structure by combining the elements drawn from the Numeration, according to certain principles and until the Numeration is exhausted. At some point during this derivation the information contained in the structure built up so far and which is relevant to PF is fed to the PF component. This point is called *Spell Out*. All syntactic operations carried out before Spell-Out are reflected in the PF output. After Spell out, additional non-overt processes may apply to the structure to derive the semantic representation (the LF interface). These additional processes, which apply AFTER Spell Out, do not have any repercussion on the overt representation of the sentence. The Minimalist type of grammar can be represented as follows:

(6)   b.   Lexicon

                                    ⟶   PF   'sound'

                    covert syntax

                                    ⟶   LF   'meaning'
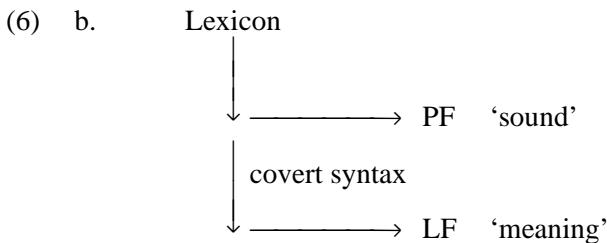
Returning to our examples: in English (7b) as well as in French (8a) the movement of the interrogative object (*who, qui*) takes place before Spell-Out, in the overt syntax, thus producing a visible displacement. In (8b) there is no movement of the interrogative constituent before Spell-Out. Movement in (8d) takes place after Spell-Out, in the covert syntax.

In what follows we outline the internal working of syntax, i.e. the computational system that builds structure. We will be combining Minimalist insights with more traditional insights from the *Government and Binding* tradition. The difference between the two traditions will be highlighted when relevant.

2.2. Syntactic structure: the X-bar format

There are a number of assumptions that seem to be relatively constant across the various incarnations of the generative framework. One is that all syntactic structure is endocentric: syntactic units are organized around a head. Each head, X, projects a larger syntactic unit (a phrase, XP), and each phrase, XP, must have one head. This assumption captures the traditional intuition that the head of a verb phrase, for instance, is a verb.

In one precise implementation of this idea, all syntactic constituents have the same format, which can be represented as in (9a) below, where X indicates the head of the constituent XP. The head X combines with a constituent, here ZP, which itself is built according to the format in (9a). ZP is referred to as the complement of X. The combination of X and its complement is referred to as X', the intermediate projection of X. This projection X' combines with another constituent, YP, referred to as a specifier, to form XP, the maximal projection. Again, YP itself is also formed according to (9a).

(9)   a.   X-bar format
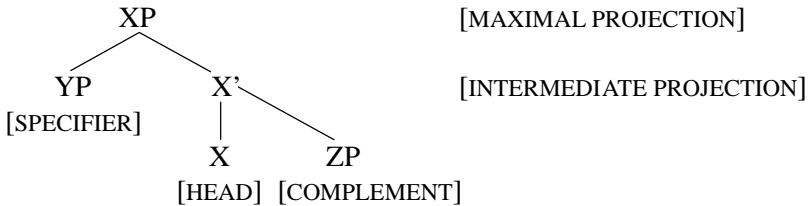
It is sometimes proposed that phrases can be added to XP through what is called adjunction. Adjunction of WP to XP creates an additional projection of the same category. In (9b), the phrase WP is adjoined to the base XP giving rise to another XP projection. The base XP and the XP created by adjunction are sometimes identified by numbers (XP1, XP2)

(9)   b.   X-bar format with adjunction
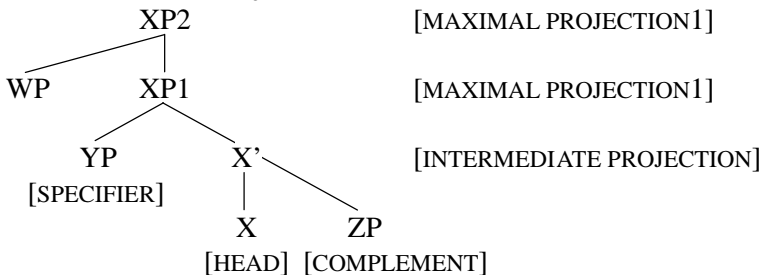
However, the concept of XP-adjunction is not generally accepted (cf. Kayne 1994; Cinque 1999).

Observe that both (9a) and (9b) contain only binary branching structures (cf. Kayne 1984), that is to say: from each point there are at most two downward branches. This format is generally assumed in current work in generative syntax both in the Principles and Parameters tradition and in the Minimalist tradition.

The basic structural configurations used to express geometrical relations between different elements in the structure in (9) are dominance and c-command. (i) Dominance refers to a relation in which one node is higher in the structure than another node. XP in (9a), for instance, dominates all the other nodes (YP, X', X and ZP); X' dominates the nodes X and ZP; YP, X and ZP do not dominate any other node. (ii) C-command expresses a relation between a node α and a node β in which the node α does not dominate the node β, but in which every node that dominates α also dominates node β. In (9a), YP c-commands X', X and ZP; X c-commands ZP. In (9b) WP c-commands XP1, X', X, ZP and YP. (9) provides the blueprint for syntactic structure, which is then realized by various categories. We turn to the concrete realization of this format presently.

The format in (9) also constrains movement: basically a constituent of the type head (i.e. X) must move to another position of the type head, while a constituent of the type XP must move to another position of the type XP. In (9a), for instance, we might imagine that ZP moves to the position YP, but not that X moves all by itself to the position YP.

2.3. Lexical categories and functional categories

It is also often assumed that there is a clear-cut distinction between two types of heads: lexical heads and functional heads.[5] Lexical heads are the 'content words' of traditional grammar: they contribute directly to the 'de-

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[5] As we will see in Chapter 2 of Part IV, in the recent literature (see e.g. work within the framework of Distributed Morphology and Borer (2005)) this position has been challenged. Several researchers thus claim that sentence elements, such as *noun, verb, adjective* have no universal significance and are essentially derivative from more basic morpheme types. Specifically, the different 'parts of speech' can be defined as Roots which combine with a set of functional heads that determine category. See Embick & Noyer (2004), Embick & Halle (to appear) for further discussion.

scriptive content' of the sentence, i.e. the description of the event or state of affairs expressed in the sentence. Lexical categories 'link' the language with the non-linguistic world, in that they 'denote' entities, properties, activities, etc which are as such non-linguistic. For instance, in (10) the lexical heads are *cat*, *drink*, *milk*.

(10)   a.   The [N cat] [V drinks] the [N milk].

There are four kinds of lexical heads: in addition to N and V, illustrated above, there are adjectives (A) and prepositions (P).

(11)   a.   The cat is [A thirsty].
        b.   The cat is [P under] the table.

Functional heads do not contribute directly to the description of the event. One of their purposes is to encode grammatical relationships, i.e. relation-ships among linguistic entities. For instance, functional categories will be involved in expressing the relation of agreement. Consider as an example the agreement between a subject and a verb in English as in (10a): *the cat* is singular and the verb *drinks* has the ending *-s,* which matches the number of the noun. The *-s* morpheme on *drink* is not an inherent part of V. The verb *eat* does not always come with the ending *-s*. Rather, it is a functional morpheme which is added to V for third person singular agreement in the present tense. This agreement morpheme links a singular subject with the verb but it does not modify the event described in the sentence. In a sense, then, the ending *-s* on the verb as such does not contribute to the interpreta-tion of the clause. In Minimalist terms the agreement ending on the verb is said to be [–interpretable].
    Now consider (10b):

(10)   b   The [N cats] [V drink] the [N milk].

Here we find an ending *-s* on the N *cat*. Again the *-s* ending is not an intrin-sic part of the noun, in (10b), for instance, there is no such ending. The *-s* ending is added to the noun to encode plural. Though this ending expresses Number, and is a functional element added to the lexical head, the number ending on the N is not uninterpretable: informally speaking, *cat* differs from *cats* in that the former denotes one entity with the relevant properties to qualify as a 'cat' and the latter denotes a plurality of such entities. So

while, in Minimalist terms, the agreement ending on the verb is [–interpretable] that on the N will be [+interpretable].

Functional elements need not be bound morphemes, free morphemes may also be functional. For instance, inserting the modal auxiliary *will* in (10c) also does not modify the event depicted by the sentence.

(10) c. The cat will drink the milk.

The activity referred to in (10c) remains the same as that in (10a). *Will* is a functional element, it does not fundamentally contribute to the description of the state of affairs expressed by the sentence. The function of the auxiliary *will* is to shift the temporal reference of the event into the future. Unlike the case for the agreement morpheme *-s* on the verb in (10a), we cannot say that *will* in (10c) does not contribute to the interpretation of the clause and that it is [-interpretable]. *Will* does have an impact on the temporal interpretation, but it does not alter the state of affairs depicted by the clause. Temporal and modal morphemes are also functional elements because, though certainly not meaningless, they do not have any impact on the event expressed by the sentence.

The third person bound morpheme *-s* in (10a) and the modal *will* in (10c) are functional elements associated with verbs. Extensive research has postulated additional functional categories related to the verb/clause, including a range of aspectual markers, modal markers etc (see Cinque 1999 for a maximally rich array of functional heads associated with the clause).

There also exist functional elements associated with nouns. We have already come across the example of the number ending on N. In the examples above, the functional element *the* is associated with the N *cat* and also with the N *milk*. *The* is a definite article or a definite determiner. Once again, inserting the definite article will not directly contribute to the description of the entity denoted by the nominal constituents: *a cat* and *the cat* both denote a certain type of animal. However, these functional elements, too, are interpretable in that, despite lacking descriptive content, they contribute to the interpretation of the DP. Articles or determiners play a role in the referential properties of the DP: the choice of the definite article in association with an N indicates that we are dealing with entities ('cat' on the one hand, 'milk' on the other) which are not mentioned for the first time; the definite determiner signals that the referents of the DPs are already accessible in the discourse, we know which cat and which milk we are talking about. By using the indefinite article *a* in (10d) we introduce a novel cat into the discourse.

(10) d. A cat was eating crisps under the table.

Functional categories, whether they are associated with the clause (and ultimately with V) or with the N, share a number of properties (see also Abney 1987: 64f):

(i)   They constitute closed classes.
(ii)   They are generally phonologically and morphologically dependent, and stressless. Often they are clitics or affixes and sometimes they are phonologically null.
(iii) They are usually inseparable from their complement.
(iv)   They lack descriptive content. (See also Ouhalla 1991; Giusti 1997 for further elaboration of these basic properties.)
(v)   Functional heads (usually) do not have arguments.

It is a standard assumption that there exists a clear-cut opposition between functional heads and lexical heads and that categories are either lexical or functional. However, as van Riemsdijk has shown (see van Riemsdijk 1998; Corver and van Riemsdijk 2001 for discussion and references), the question arises whether such a clear-cut dichotomy is tenable. In fact, it has been pointed out that in certain cases there seem to be categories which (at least in certain environments/constructions) have properties both of lexical heads and of functional heads (van Riemsdijk 1998).

One case in point concerns motion verbs. Consider for instance the American English use of *go* in (12a) (see among others Jaeggli and Hyams 1993; Pollock 1994):

(12) a. John will go buy bread.

This construction, in which the verb *go* appears followed immediately by a bare infinitive, is subject to a number of restrictions. For instance, the verb may not appear inflected:

(12) b. *John goes buy bread

There is a very restricted number of verbs in English that enter this pattern, namely *come, go, run.* The fact that we are dealing with a closed class may lead us to think that these verbs are functional, rather than lexical. This is confirmed also by the fact that in this use *go* cannot associate with a Goal argument:

(12)   c.   *John will go to the store buy bread.
     d.   John will go to the store to buy bread.

Typically, lexical heads are associated with arguments/thematic roles, while functional categories are not associated with thematic roles. Thus it appears as if the verb *go* has two uses in American English: it is either a lexical verb, the 'normal' use, in which case it can take arguments, or it has acquired functional properties, as in the examples illustrated in (12a–c). The analogies of *go* in other languages too, display 'mixed' properties, as shown, for instance, by Haegeman (1990) for West Flemish, by Schoenenberger and Penner (1995) and van Riemsdijk (2002) for Swiss German, and by Cardinaletti and Giusti (2001) for Southern Italian dialects and for Swedish. Elements like *go* illustrated above seem to belong to a hybrid category, in that they are partly lexical and partly functional. Often they are referred to as semi-lexical or semi-functional categories. For further illustration of hybrid categories see also the papers in Corver and van Riemsdijk (2001).

One of the goals of this book is to provide an inventory of the functional categories that have been identified in relation to the nominal domain. We will also examine to what extent they correspond to matching functional categories in the clause. In the next section we survey some of the functional categories associated with the clause level. Once we have established the functional structure of clauses, we can investigate to what extent nominal projections are similar to or different from clauses in the course of this book. Once we decide that clauses contain functional projections such as TP or AspP, we will try to determine to what extent such projections are valid for the nominal projection. This will be discussed in Part II of this book.

Given the evidence for the semi-lexical categories in the clausal domain (see van Riemsdijk 1998, Corver and van Riemsdijk 2001), we may ask ourselves if the same is true for the nominal projection. The answer seems to be positive. Van Riemsdijk (1998), for instance, discusses partitive constructions like (13) from Dutch:

(13)   a.   een plak kaas
        a slice cheese
        'a slice of cheese'

     b.   een snee brood
        a slice bread
        'a slice of bread'

As the English translations suggest, the two juxtaposed nouns are in a partitive relation. Van Riemsdijk shows that in spite of there being two nouns in the constituent, the behavior of the containing nominal constituent is that of a projection of a single head. In Chapter 2 of Part III we will return to the issue of the presence of semi-lexical heads in the nominal domain, building mainly on van Riemsdijk's work (1998).

2.4. Lexical categories and Argument structure

2.4.1. Verbs and arguments

As mentioned already, lexical heads contribute directly to description of the event or state of affairs expressed in the sentence. Typically, the element which plays the major semantic role in this is the lexical verb. Consider the examples in (14). Depending on the choice of lexical verb, the sentences contain a different number of arguments: (14a) has two arguments, *Topsy* and *the milk*, (14b) has one argument, *Topsy*, and finally (14c) has three arguments, *we, Topsy* and *the milk.* In the traditional literature we will say that *drink* is a transitive or an intransitive verb, *yawn* is an intransitive verb and *give* is a ditransitive verb.

(14) a. Topsy drank the milk
     b. Topsy yawned.
     c. We gave Topsy the milk.

The number of arguments in a given clause is determined by the type of predicate, here the verb. The predicate (here the verb) assigns a number of thematic roles associated with the participants involved in the event or state described.[6]

There is a one-to-one correspondence between theta roles and arguments within a given clause. In the *Government and Binding* framework, this property of the grammar was expressed in terms of the Theta Criterion, which required that (i) each theta role of a predicate is assigned to one and only one argument, and (ii) each argument is assigned one and only one

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[6] For instance, among transitive verbs some are associated with an Agent and a Theme (ia), others with an Experiencer and a Theme (ib):
(i) a. I picked up the cat.
    b. I liked the cat.

theta role. Thus, the Theta Criterion determines the number of arguments which are required and allowed within a clause. For example, the activity described by a verb like *yawn* only involves one participant, the Agent of the action, the verb *yawn* therefore assigns one thematic role and it only requires one argument, in (14b) realized as *Topsy*. The verb *drink* involves two participants, hence it assigns two thematic roles, Agent and Theme, the entity affected by the action. A verb like *drink* therefore requires two arguments. Finally the verb *give* is associated with three participants, the Agent, the Receiver (or Goal), and the Theme.

There is a vast literature on the matching of argument structure with syntactic structure and in this introduction we cannot hope to do justice to all the various approaches. The reader is referred to Baker (1997), Levin & Rappaport Hovav (2005) and Borer (2005) for discussion. We will limit ourselves only to those aspects that will become relevant for the discussion on the presence of argument structure in nominals.

With respect to verb syntax, two approaches to the question of argument structure can be identified. On the one hand, concentrating on the lexical semantics of a verb and the syntactic structures it can occur in, we can discern at least three different levels of representation of the relation between a predicate and its argument(s): (i) a lexical semantic representation, (ii) a lexical syntactic representation, (iii) a syntactic structure representation. The lexical semantic representation of a predicate, often called lexical conceptual structure (LCS), is the 'deep' semantic description, which is probably unique for any particular predicate, or a class of predicates. LCS decomposes the meaning of a verb into structures containing variables and meta-predicates (like CAUSE, BE, etc.). Such a semantic description is mapped onto the lexical syntactic representation, which is often called predicate argument structure or argument structure (AS). AS represents how many arguments a verb requires and to which syntactic argument positions these are linked, for instance by making a distinction between external and internal theta roles (Williams 1981). On this view, the number of arguments a predicate has depends on its meaning. Finally the syntactic representation will articulate argument structure in the extended projection of the predicate. For further discussion of this approach see Alexiadou, Anagnostopoulou & Everaert (2004).

2.4.2. Decomposing the VP

2.4.2.1. Ditransitive verbs and binary branching

The alternative 'decompositional' syntactic approaches to the licensing of arguments are inspired by Larson's (1988) proposals to decompose V.

In a nutshell and simplifying a lot here, Larson's proposal aimed at reconciling the binary branching X-bar format for structure in (9) with the observation that ditransitive verbs have three arguments. Assuming that one of the arguments of the verb could become the subject, the question arose how to deal with the two remaining arguments, which somehow would have to both be internal to the VP. The question is how one VP could contain three arguments. According to the X-bar format, there is one specifier position. If we assume that one argument (the subject) can be associated with the specifier position, then the internal structure of a verb with three arguments would have to be realized by postulating two complements. At first sight one might think of something like (15a):

(15) a.
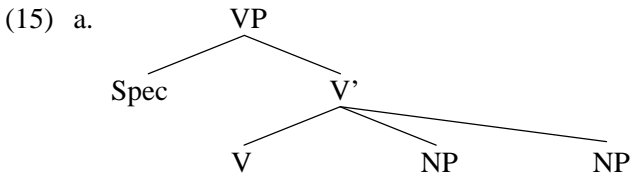
However, (15a) does not respect the binary branching structure since from (V') there are three downward nodes.

In order to overcome this problem, Larson (1988) proposed decomposing the node V and creating layers internal to the projection VP to show internal structural relations between what seem to be two complements. One proposal would be to replace (15a) by (15b) in which the indirect object and the direct object form a constituent, here labelled ?P:

(15) b.
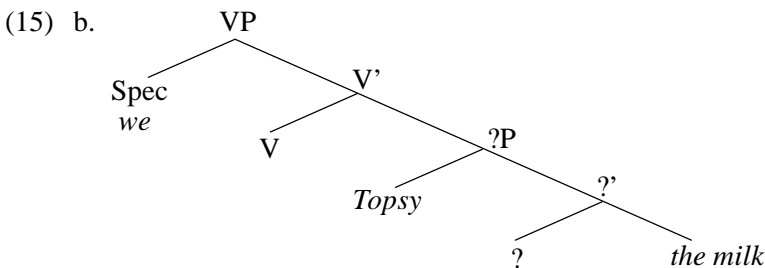
This representation respects the binary branching format. The question arises what label ? corresponds to. One option would be to take into account the interpretation of the verb *give*: 'give' can be compared to 'cause to get': if we give Topsy some milk then we bring it about ('we cause') that Topsy will get some milk. Many verbs can be said to contain such a 'causative' component. It has been proposed that the causative component of a lexical verb be represented by a special symbol, 'v' ('little v'). The causative component of the lexical verb, 'little v', is associated with the Agent role: in (14c) the Agent of the action of giving is *we*. Thus the Agent is represented as the specifier of vP, the projection of causative v.

Between indirect object and direct object there is a possessive relation, brought about by the Agent. The relation between the indirect object and the direct object could be represented by means of the symbol V, and *give* would thus be represented as decomposed into 'cause' and 'get'. CAUSE and GET in (15c) do not stand for verbs that are realized lexically. Rather they represent the semantic primitives that build up the interpretation of the verb *give*.

(15) c.
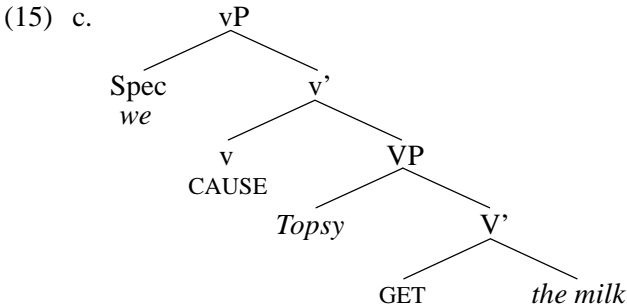
Observe that in (15c) the indirect object *Topsy* and the direct object *the milk* form one constituent, VP, which excludes the Agent. [7]

There are several other proposals in the literature, but because we will not be dealing in detail with VP syntax we will not go into them. See Baker (1997) and Emonds and Whitney (2006) for recent discussion and evaluation of some proposals.

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[7] See Part IV Chapter 2, section 3.2. for an implementation of this structure to encode possession in the nominal projection.

2.4.2.2. *Extending the proposal*

Larson's proposal that V may decompose into different shells (vP and VP in (15c), for instance) has been extremely influential. The layered structure of the VP has been generalized also for the cases in which a verb has only one or two arguments. Hale & Keyser (1993) and Borer (2005) suggest that the syntactic structure gives rise to a template which in turn determines the interpretation of arguments. Essentially, what we could call lexical heads are decomposed and their internal structure encodes the different semantic relations between the various arguments. This view has been adopted in the Minimalist program, leaving the status of the theta-criterion rather unclear. Below we provide a sketch of the motivation for the decompositional approach. For more details the reader is referred to the literature.

Hale & Keyser (1993) generalize Larson's VP-shell analysis to monotransitive verbs such as *drink* and propose that the thematic role of Agent, the entity that initiates the action, is always associated with a separate ('causative') head v ('little v'). The internal argument of a monotransitive verb occupies the complement of the lower VP-shell and the external argument is generated in the specifier position of a higher vP shell. In this view, each thematic role is uniquely related to a head, i.e. the internal theta role is related to the lower V-head and the external theta role to the higher v-head. [8]

(16) a.

_____
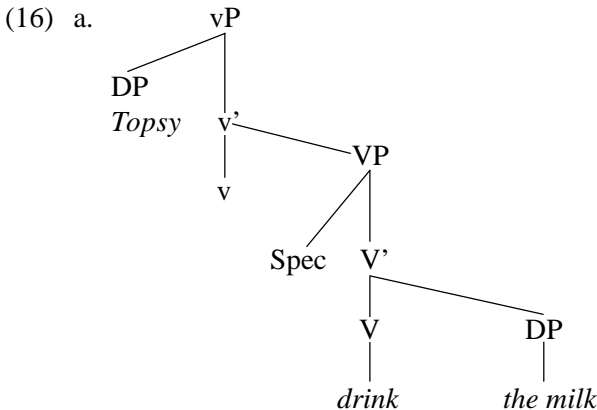
[8] As the reader can observe, the final step in this development would be to decompose the representation of (15c) even further and to also analyse ditransitive verbs in terms of structures involving a separate head for each argument (cf. e.g. Collins 1997: 53ff.; or Marantz 1993: 115ff.). We will not go into this issue here as it will not affect the discussion at this point.

Note that with respect to the functional/lexical divide, the status of 'v', the head which is related to the external argument, is not completely clear. For instance, Chomsky (1995) proposes that v is somehow both lexical and functional. Other labels have also been proposed for the head related to the external theta role, such as Voice (Kratzer 1994), Act(ive) (Holmberg & Platzack 1995) or Tr(ansitivity) (Collins 1997).

   The decomposition of V is also extended to one-argument verbs, and is used to draw the distinction between unergative verbs such as *sleep* or *telephone* and ergative verbs such as *arrive, come*. Unergative verbs are treated as concealed transitives in this system in that they have a non-overt (cognate) object, see (16b), while unaccusative verbs either lack vP altogether, or contain one with no projected specifier (Chomsky 1995: 315):

(16) b.
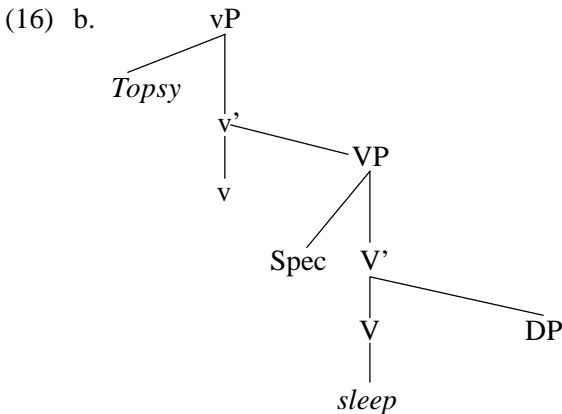
2.4.3. Nouns and arguments

Having established that the argument structure of V determines the presence of a number of other components of a clause, Part IV of this book addresses the question whether the same applies for the relation between N and its projection.

   As illustrated in our examples in (3b) above, one might wish to say that nouns too are associated with arguments. In the earlier example the genitive DP *Caesar's* seems to refer to the Agent of *destruction,* in the same way that *Caesar* is the Agent of *destroy* in (3a). Since the NP/DP is a projection of N, a lexical head, the question that arises is that of the licensing and inheritance of argument structure in the nominal domain, which we will ad-

dress in Part IV of this book. As we will show in that chapter, proposals with respect to the argument structure of the nominal head are similar to those that have been put forward with respect to the verbal projection in that again, both semantically based proposals and structurally based proposals have been put forward.

2.5. Functional projections

2.5.1. *Evidence for functional projections*

In general, three types of evidence are advanced for postulating functional categories/heads: semantic, morphological, and syntactic/distributional. In this section we will show how this evidence has been applied for postulating a head position in the clausal domain and we will further discuss, for each type of evidence, how an analogical reasoning could lead us to postulate a functional head in the DP. It should be emphasized that the three types of evidence cannot always be separated as they are here (for ease of exposition). More often than not, morphological, semantic and distributional evidence will converge to corroborate postulation of a functional category.

(i) Semantic arguments

A first type of evidence for postulating functional projections is semantic. The line of reasoning is roughly as follows. Lexical categories may be taken to express certain concepts, but in the context of clauses, these 'lexical' concepts are associated with additional notions. The idea is then that these additional notions are encoded in functional heads that are associated with the lexical head in question.

For instance, and simplifying a lot here, consider the sentence. It can be said that its semantic core is the verb and that a verb phrase expresses some action or state. However, to describe the meaning of the sentence as a whole, we need to take into account that a sentence adds a temporal dimension to the action/state expressed by the verb. The temporal reference associated with a clause is to some extent independent of the verb in that one may choose one such temporal expression among the various available ones (say past tense vs. future tense) in a given language. Verbs are not tensed 'as such'. The observation that sentences are associated with a temporal reference, and that this is not an inherent property of the predicate (verb or adjective, for instance), may then lead us to postulate a specialized

head to encode temporal reference. The head that encodes temporal reference can be labeled Tense (T); it selects a projection of V as its complement and it projects a TP.

In the nominal system we can apply the same reasoning. Constituents headed by nouns denote entities (persons, things) but they also contain information concerning reference (see section 2.3.). Since such information is not an inherent part of the noun, it is proposed that there is a specialized head D to encode the referential status of the nominal projection. D selects NP as its complement and projects DP. From the early days of the DP-hypothesis, D has been linked with encoding reference. It has also often been observed that projections headed by nouns may function either as arguments or as predicates, in the latter case the constituent is not referential. In a number of languages, an NP used as an argument will obligatorily have to be accompanied by a determiner, while a NP without the determiner may be used as a predicate. Hence, a functional head D has also been postulated to encode argument status.

Nominal projections may refer to one or more entities. This difference concerns number, and again number is not intrinsically part of the N: informally put, we choose the number of the noun depending on the intended interpretation. The fact that a projection of a noun (or, taking into account the functional structure, a DP) can be interpreted as referring to one (singular) or to any number (plural) of entities was taken as evidence that a specialized projection for encoding Number, namely NumP, should be postulated. As we will see in some detail in the first chapter of Part III, for instance, Bouchard (2002), attributes the referring capacity of noun phrases to the properties of the semantic category of Number.

(ii) Morphological evidence

Another type of evidence for postulating functional categories is morphological. In many languages when lexical heads are inserted into a sentence they do not come 'bare', that is as mere stems. Rather, they are associated with inflectional morphology. Because morphology is variable (for instance the verb may be associated with a choice of tenses) it is not taken to be an intrinsic part of the lexical head as such, but rather it can be argued that the inflectional morphemes constitute functional heads in the extended projection of the lexical head.

Let us see how the morphosyntactic argument works. The observation that verbs can be associated with inflectional morphemes related to mood, agreement, tense, aspect and voice is invoked as evidence for postulating

the relevant functional heads, such as, for instance, Agr, T, Asp, Voice. Again Ns often inflect for number, which would be taken as evidence for postulating a functional head Num, thus supporting the NumP hypothesis. In a similar vein, many researchers have further postulated a Gender Phrase, based on the fact that at least in some languages nouns are marked for Gender (or Word Class, cf. Picallo 1991; Bernstein 1993). Although an obvious difference between verbs and nouns might seem to be the presence of tense morphology in the former and its absence in the latter, there are languages in which nouns may be argued to be morphologically marked for tense. Thus, at least for these languages the morphological evidence could be said to support postulating a Tense Phrase as a candidate for a functional projection in the nominal domain (see for instance Wiltschko 2003 on Halkomelem Salish, and Matthewson 2005 for a different view). Similarly, in the same way that aspectual projections are postulated for the clause on the basis of the aspectual inflection of the verb, some languages seem to provide morphological evidence for aspectual morphology, hence aspectual projections within the extended projection of N (Alexiadou & Stavrou 1998a; Alexiadou 2001a for Greek).

It is clear that in many cases the semantic argument and the morphological argument will coincide, since a semantic concept will often have a morphological expression, and an inflectional morpheme will usually have some interpretative effect. They are, however, not identical. One case in point has already been mentioned: while in English the *-s* ending on plural nouns may be directly linked to their interpretation, in that it encodes plurality, it is not clear that the third person singular ending on English verbs has a semantic reflex.

The morphological argumentation is often further supported by the observation that a bound inflectional morpheme in one language corresponds to a free morpheme in another language. Since the latter case would motivate postulating a head position, one might invoke a similar position for languages in which there is a bound morpheme. For instance, while English uses a free morpheme (*will*) to express future time, French uses a bound morpheme, the so called future tense. Thus the fact that one needs to postulate a position to host *will* in English could be used in support of postulating a similar head in French. However, this kind of reasoning presupposes that one assumes a universal hierarchy of projections (cf. Cinque 1999).

The universal hierarchy argument could be used in support of postulating a head num within the noun phrase since there are languages such as Gungbe, described by Aboh (1998), in which number is expressed by a separate free morpheme:

(17) távò xóxó dàxó éhè ló   lɛ
     table old   big   this the PLURAL
     'these big old tables'

Observe that the word order internally to the DP in this language is almost
a perfect mirror of that found in English. We will return to this example in
section 2.6.3.3.

(iii) Distributional/syntactic evidence

As discussed above, the distribution of the lexical head within the constitu-
ent which it heads may also be interpreted as evidence for functional pro-
jections. Two types of argumentation are relevant here. These were formu-
lated by Taraldsen (1990). The first type of argument essentially relates to
the distribution of heads and is based on three widely accepted axioms of
the *Government and Binding* model: (i) a head can only move to a head
position; (ii) every head X_0 is the head of maximal projection X_n; and (iii) a
moved constituent must c-command its trace (Taraldsen 1990: 85–86). The
second type of argument relates more to the distribution of XPs and is
based on the premise that every X_n dominates at most one specifier (see
Taraldsen 1990 for details). Let us consider some illustrations.

    Consider the first type of argumentation. The distribution of the lexical
verb with respect to adverbial adjuncts and to markers of sentential nega-
tion shows that the verb cannot always be assumed to remain in its base
position. This is illustrated by the contrast between English (18a) and
French (18b)[9]:

(18) a. Nelson always eats biscuits.
      b. Nelson mange toujours des croquettes.   (French)
         Nelson eats always biscuits

In (18a) the verb *eats* is adjacent to its direct object *biscuits.* We might as-
sume that it occupies its base position in the VP. In the French example
(18b), the verb *mange* is separated from its object *des croquettes* ('bis-
cuits') by an adverbial adjunct, *toujours* ('always'). This suggests that in
(18b) V is not inside VP but has moved leftward. If V moves then we must
conclude that there is a landing site available, i.e. we must postulate a func-
tional head. In English, there is no evidence of this kind, because lexical

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9   See Emonds (1978) for a first discussion.

verbs fail to occupy displaced positions, but auxiliaries seem to be able to occupy different positions, suggesting that they move. Thus in (18c) the non-finite auxiliary *have* occupies a lower position than its finite counterpart in (18d).

(18)   c.   Nelson will already have eaten the biscuits.
       d.   Nelson has already eaten the biscuits.

By analogy, evidence that N may occupy more than one position in the nominal constituent could lead us to assume N-movement and hence to postulate specific head positions as landing sites for N. We have already briefly discussed one example of this type in section 1, see the data in (4).

   The second line of argumentation concerns the distribution of maximal projections and is invoked when two constituents in an extended projection seem to have specifier properties. Such evidence will lead to postulating two specifiers, hence two heads. In other words, in addition to a lexical head, which can provide one specifier slot, at least one functional head is required in order to provide the second specifier.[10] For instance, it has been observed that in some languages subjects may occupy different positions in the clause. In (19) we illustrate the case of Dutch:

(19)   a.   Dat er morgen drie studenten vertrekken.
            that there tomorrow three students leave
            'That there are three students leaving tomorrow.'

       b.   Dat drie studenten morgen vertrekken
            that three students tomorrow leave.
            'That three students are leaving tomorrow.'

In (19a) the subject DP *drie studenten* ('three students') is adjacent to the lexical verb *vertrekken* ('leave'); in (19b) it is separated from the verb by the adjunct *morgen* ('tomorrow'). This might lead us to conclude that the maximal projection *drie studenten* has undergone leftward movement. If the movement of the subject in (19b) can be argued to target a specifier position, then we need to postulate at least one functional head whose specifier can host the moved DP. The functional head whose specifier is the

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[10]   The argumentation is based on the assumption that each projection has just one specifier. See section 2.5.3.2., however, for alternatives which would invalidate this line of argumentation.

canonical VP-external subject position has been identified as AgrS (but see section 2.5.3.1) or as T. A similar point could be made on the basis of the Icelandic examples (19c) and (19d):

(19) c. Hann las ekki baekur.   (Icelandic)
           he reads not books
           'He doesn't read any books.'

      d. Hann las baekurnar ekki.   (Icelandic)
           he read the books not
           'He doesn't read the books'

In (19c) the indefinite object DP *baekur* ('books') follows the marker of sentential negation e*kki*, in (19d) the definite object *baekurnar* ('the books') precedes it. The leftward movement of definite object has sometimes been referred to as 'object shift' (Holmberg 1986). If object shift in (19d) can be argued to target a specifier position, then we need to postulate an additional functional head whose specifier can host the moved DP. The functional head whose specifier hosts a moved object has sometimes been identified as AgrO (Belletti 1990; Chomsky 1991, 1995) (but see 2.5.3.1).

   Again, if we observe that DP-internally, maximal projections may occupy different positions this can motivate postulating specifier positions, and by implication it provides indirect evidence for functional projections.

   As we will also discuss in Chapter 1 of Part III, the position of sentential adverbials has also been interpreted as evidence for postulating functional projections in the clause. It has been proposed that adverbial modifiers are the specifiers of specialized projections. For instance in (20a) the adverbs *frequently* and *viciously* have been argued to be specifiers of functional projections.

(20)   a. Mary frequently viciously criticized John.

(20b) is a nominalization related to (20b): the adverbials in (20a) correspond to adjectives (*frequent, vicious*) in (20b):

(20)   b. Mary's frequent vicious criticism of John

If adjectival modifiers in the DP are seen as the analogies of adverbial modifiers in the clause, then again the functional projections postulated for hosting adverbial adjuncts in the clause could be replicated in the extended projection of the noun where they would host adjectives.

Using the type of argumentation sketched above, research on the structure of the clausal domain has provided us with a very rich inventory of functional projections.

Initially, standard generative approaches to clause structure propose that in the build-up of the clause three distinct layers can be distinguished. (i) The VP layer is projected around the lexical verb. This layer is the semantic core of the clause: it contains the predicate and its arguments. (ii) The IP layer is projected around the inflectional head (I), which encodes modal, temporal and aspectual properties of the clause. (iii) The CP layer is the interface between the propositional content of the clause and the context: it is projected on the basis of the position C, which hosts, among other things, subordinating conjunctions such as *that* or *if*.[11] The CP layer is often referred to as the 'left periphery'.

It is assumed that the subject originates VP internally (see section 2.4.2). In English the subject moves to the specifier of IP, represented as SpecIP. Originally the requirement that the subject move to the specifier of IP (i.e. SpecIP) was referred to as the 'Extended Projection Principle'. Nowadays in the Minimalist tradition the label EPP is used more widely to refer to the fact that a particular head requires a specifier. Such a head is then said to have an EPP feature. We return to the movement of the subject in section 2.5.2.2.1.

(21a) is a schematic representation. For ease of exposition we do not decompose the transitive VP into vP and VP. We represent nominal projections as 'DP'.

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[11] In main clauses C is either non-overt (ia) or it may be filled by the auxiliary in contexts of subject-auxiliary inversion (ib). In (ib) the auxiliary *will* has moved from its position IP to the position C. It leaves a coindexed trace in its original position.

(i)   a. $[_{CP} [_{IP}$ I will $[_{VP}$ talk to John]]]
       b. $[_{CP}$ Will$_i$ $[_{IP}$ you t$_i$ $[_{VP}$ talk to John]]]

As mentioned before, in the representations, the symbol t stands for the 'trace' of the moved constituent, with which it is coindexed. For instance, t$_i$ is the trace of the fronted auxiliary *will* in (ib). (ic) uses the strikethrough notation

(i)   c. $[_{CP}$ Will $[_{IP}$ you ~~will~~ $[_{VP}$ talk to John]]]

(21) a.
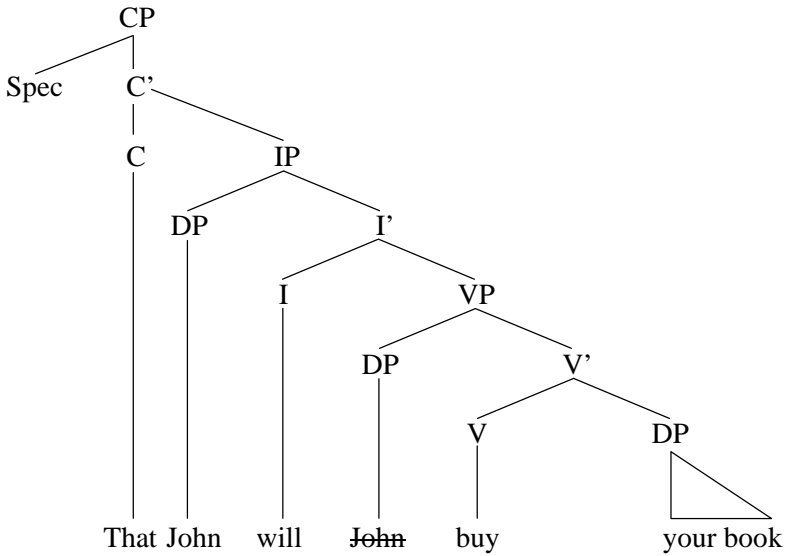
Later work in the wake of Pollock (1989) suggests that the clause structure is more richly articulated than this. For instance, it has been argued that IP should be decomposed into the components T (tense) and Agr (agreement). We refer the reader to section 2.5.1. for a brief summary of the argumentation. See also Pollock (1989, 1997). For a critical discussion see also Iatridou (1990).

Further comparative research has revealed the need for postulating additional functional nodes in the domain between V and C, e.g. Mood, Aspect and Voice. On the basis of this, we end up with a rich clause structure in which IP is argued to decompose into at least the following projections:

(21) b. MoodP > AgrP > NegP > TP > AspP   vP/VoiceP   VP

It has also been argued that CP should be decomposed into different functional projections. In particular, on the basis of a range of theoretical and empirical considerations of the same nature as those discussed above, Rizzi (1997) proposes that the head C (cf. (21a)) be decomposed into a number of separate projections. In addition to a Force head, associated with encoding illocutionary force, and a Fin head, which characterizes the morphological properties of the complement clause, the CP domain may also contain a unique Focus projection, FocP, whose specifier hosts the focalized constituent and whose head hosts an abstract Focus-feature, and a recursive

Topic Projection, whose specifier hosts a topicalized constituent and whose head hosts a Top feature.

(21) c. ForceP > TopP* > FocP > TopP* > FinP

Given the discussion above, clauses are interpreted as extended projections of V, i.e. projections of V augmented with a range of functional projections (see Grimshaw 1991 for the notion of extended projection). Obviously, once we assume that there is a wide range of functional projections dominating VP, the question can be raised whether there are also functional projections that dominate NP within the extended projection of N, and whether one can identify the same type of functional projections in the nominal domain. Part II of this book mainly deals with this question.

2.5.2. *Functional projections, movement and agreement*

2.5.2.1. *Features and agreement*

Functional projections are projections of functional heads. In the clausal domain, a functional head, say T, will select an extended projection of V as its complement. T, for instance, selects AspP. A functional head can attract a lower head, for instance, T may attract V. As each projection contains a specifier position, these specifiers will provide us with additional positions which are the landing site for movement (see our earlier reference to Taraldsen 1990). For instance, the specifier of TP is available for movement. With respect to the clause, two types of movement have been distinguished in the literature: (i) head movement and (ii) movement of maximal projections. The status of head movement is unclear in current versions of the Minimalist Program. We do not dwell on this very much here. The reader is referred to (Chomsky 2001; Lechner 2005) for extensive discussion.

The Minimalist Program attributes an important role to features in the derivation of the sentence. Features basically drive the concatenations of elements that will build up the sentence. Heads (both lexical and functional) may be associated with features. For instance, as we have seen already, both verbs and nouns may be associated with agreement features such as number. Some features are said to be interpretable or valued, others are not interpretable or unvalued. As discussed above (see the discussion of

(10a, b) in section 2.3.) the feature Number is interpretable (or valued) on nouns, whereas it is uninterpretable (or unvalued) on verbs. Uninterpretable features are not tolerated by the system and must be eliminated by checking. Alternatively, in a system that uses feature valuation, unvalued features must be valued.

In principle, the checking of uninterpretable features – or, in the alternative approach, valuation of unvalued features – can be achieved without movement. Let us briefly outline how both of these systems work. Say a particular functional head contains features that are [–interpretable] or [–valued]. If they remain in the derivation the structure cannot converge. For [–interpretable] features to disappear, they must be matched with corresponding [+interpretable] features. The very presence of uninterpretable features renders them active, so that they can search or 'probe' in their c-command domain for matching interpretable features. Once such features are located on a goal, they are matched with the uninterpretable features of the probe, matching leads to agreement, agreement will check and eliminate an uninterpretable feature.

Observe that the presence of an uninterpretable feature on a probe does not irrevocably lead to movement. Whether or not movement also occurs depends on some other property of the system. For instance, if a head carries an EPP feature, this feature will trigger movement.

In an alternative formulation features are [+/– valued]. [–Valued] features must be valued, that is to say they must receive a value. Again, in order for unvalued features to receive a value they must enter an Agree relation with a suitable goal, which will contain matching valued features. Again, the presence of unvalued features renders them active, so that they probe in their c-command domain for matching features. Once such features are located on a goal, they are matched with those of the probe; matching leads to agreement, and hence valuation of the unvalued feature. Again, whether or not movement also occurs relates to other properties of the system such as the presence of EPP features.[12]

We have already alluded to the contrast between intrinsic features and non intrinsic or optional features. This point will be relevant when we discuss the functional projections in the nominal domain. Intrinsic features are

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[12] Whichever system (valuation or checking) is adopted, it is also clear that movement must be triggered. A constituent will not move without such a trigger. As mentioned in section 2.1., movement is a last resort operation.

those features that are an inherent inseparable part of a lexical item. Non-intrinsic or optional features are those features that can be varied. That is to say, their value can be chosen and this choice is made via the Numeration, the set of items which constitute the building blocks for the derivation. For instance, as we will discuss in detail in Part II, Chapter 3, whereas Gender is an intrinsic feature of the nouns, Number is an optional (or non-intrinsic) feature. Number is a category the values of which (singular/plural or other) can be chosen, or put differently, Number features are varied. Gender, as a rule, cannot be chosen: its values form part of the noun itself.

2.5.2.2. *Types of movement*

In the *Government and Binding* tradition, two types of XP movement are postulated: (i) A-movement and (ii) A'-movement. For discussion of the contrast we refer to standard textbook introductions such as Haegeman (1994) and Radford (1998). The contrast between the two types of movement has so far been maintained in the Minimalist tradition. We give a brief overview of how movement operates. Observe, though, that the discussion below is a simplification and that there are many different implementations of the fundamental ideas.

2.5.2.2.1. A *movement*

It is assumed that the clausal subject DP originates in a VP-internal position. For transitive verbs this is the specifier position of vP. However, it is clear that the subject DP, *Nelson* in (18a) for instance, does not remain VP-internally. If it did, we would expect it to be adjacent to the lexical verb *eats*. In order to account for the fact that the subject is separated from the VP domain and ends up in the canonical subject position, SpecTP (or SpecIP), it is assumed that the subject has to undergo leftward A-movement.

If the subject moves to SpecTP then we can assume that the trigger for the movement is an uninterpretable feature located on T. What could this feature be? We have proposed that nominal projections have interpretable [Number] features, while the Number features associated with verbs are uninterpretable. Observe that Number inflection on verbs is also a function of finiteness: in English and in French only tensed verbs can be associated with Number. Let us assume that the uninterpretable Number feature of the verb is encoded on Tense. Thus for the derivation to converge we must eliminate this uninterpretable feature on T. Recall that the presence of unin-

terpretable features renders them active, so that they probe for matching features in their c-command domain. So the uninterpretable number feature on T will search for a goal with a matching feature in the clause. The subject DP, in SpecvP, is such a goal. Once the matching interpretable feature is located on the goal, it is matched with that of the probe, matching leads to agreement and leads to the elimination of the uninterpretable Number feature.

Observe that the subject DP does not move to SpecTP because of the presence of the uninterpretable number feature. Rather it is assumed that T has a so-called EPP feature, and it is this feature which requires the filling of the specifier of T. (22) summarizes the derivation:

(22) a.   TP
           |
         T'
         /\
        T   vP
   [uN, T, EPP]   /\
              DP   v'
              [N]   /\
               | v   DP
            Nelson eats biscuits

      b.   TP
              /\
          Spec   T'
           | /\
        Nelson T   vP
         [N] [uN, T, EPP] /\
                        DP   v'
                        [N]   /\
                         | v   DP
                       Nelson eats biscuits
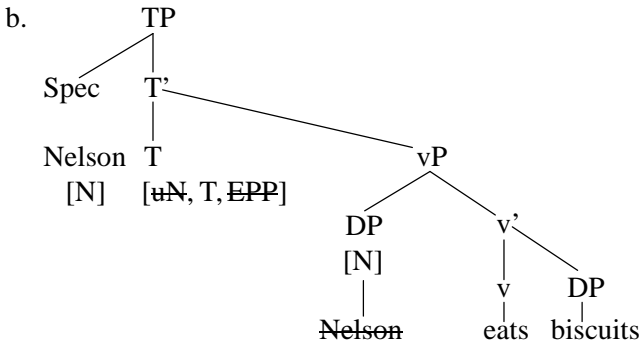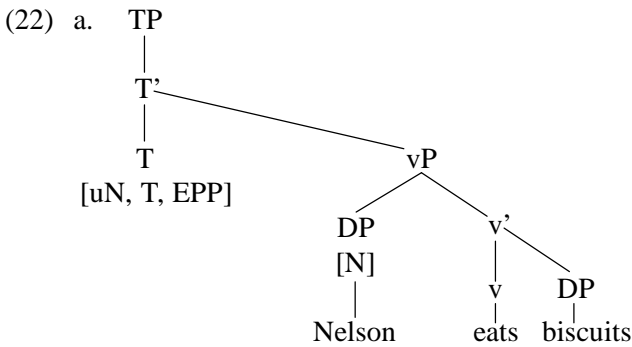
The moved DP *Nelson* leaves a copy in its original position: this is represented by strikethrough in (22b).[13]

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[13] Recall that in the Minimalist tradition, copies replace the earlier concept of traces (see section 1).

In (23) we illustrate A' movement. A constituent of the clause has moved to the left periphery: the leftward movement of interrogative constituents *how important* in (23a), and *what* in (23b), marks the clauses as questions.

(23) a. [$_{CP}$ [$_{DP}$ What] will [$_{IP}$ the cat ~~will~~ eat ~~what~~]]?
    b. [$_{CP}$ [$_{DP}$ How important] will
       [$_{IP}$ the movement ~~will~~ become ~~how important~~]]?

The system elaborated above will also be implemented to account for A' movement. In particular, for movement of interrogative constituents it could be assumed, for instance, that their interpretable [WH] feature can check the uninterpretable [WH] feature on C. Once again, movement as such will be triggered by an additional EPP feature on C.

2.5.2.3. *Features and movement in the nominal projection*

If we assume the mechanisms for movement outlined above for the clause then the question will arise whether they are also applicable in the nominal projection. We will return to the concept of head movement in Part II, Chapter 1 and in Part III, Chapter 1. At various points in the book we will also turn to the issue of DP movement within the nominal projection.

2.5.3. *Challenging functional projections*

2.5.3.1. *AgrP*

In section 2.5.1. we saw that morphological evidence has been used to postulate functional projections. By this reasoning, the fact that verbs are inflected for agreement had led to the assumption that the functional domain of the clause contains an Agreement projection, AgrP (see (21b), Pollock 1989; Chomsky 1991). Initially, support for AgrP was also provided on the basis of the distribution of finite verbs. For instance, based on the contrast between the finite verb and the infinitive in French, Pollock (1989) concludes that IP must be split into at least two projections, which he labels TP and AgrP. The data are provided in (24):

(24) a. Jean ne mange pas souvent de chocolat.
          Jean NEG eats not often chocolate
          'Jean doesn't often eat any chocolate.'

      b. Ne pas souvent manger de chocolat, c'est triste.
          NEG not often eat chocolate, it is sad.
          'Not often eating chocolate is sad.'

      c. Ne pas manger souvent de chocolat, c'est triste.
          NEG not eat often chocolate, it is sad.
          'Not often eating chocolate is sad.'

We see that in (24a) the finite verb *mange* ('eats') precedes the marker of sentential negation *pas* as well as the adverb of frequency *souvent* ('often'). This order can be derived if we assume that the verb moves from its base position to a higher functional head. In (24b) the infinitive *manger* ('eat') is adjacent to its object *de chocolat* ('chocolate') and follows the adverb *souvent.* Arguably it occupies a position in the VP. But in (24c) the infinitive is found between *pas* and *souvent:* this suggests that it is not VP internal, neither does it occupy the functional head position which it occupies in (24a). We conclude that there must be another landing site for V, between the negation marker and the adverb. In other words, IP decomposes in at least two projections. Pollock (1989) proposes that TP dominates AgrP. Based on morphological evidence, however, Belletti (1990) proposes that AgrP dominates TP (see also Pollock 1997 for a refutation).

   However, consider what it would mean to assume a projection AgrP in terms of the checking theory we have outlined above. Assuming that AgrP dominates TP, we would assume that the subject DP ends up in SpecAgrP, that 'verbal' agreement features on Agr, such as Number, are [–interpretable] (or unvalued) and that the agreement features on the noun (Number, say) are [+interpretable] (or valued). The [–interpretable] features on Agr will be a probe searching for a matching interpretable feature in the c-command domain: this search will locate such features on the subject DP in SpecvP and by agreement the uninterpretable features on Agr will be checked and deleted. As a result, though, Agr, which by hypothesis only contains uninterpretable agreement features, would really have no features left any more.

   In early versions of Minimalism (Chomsky 1991), uninterpretable features, such as agreement features associated with the verb, were taken to be able to project their own functional category. This view has subsequently been called into question (Chomsky 1995: Chapter 3) and such features are

now often taken to be licit only when associated with heads that also have interpretable features. So, for instance, the uninterpretable agreement features associated with the verb are located on Tense, which itself also has the interpretable Tense feature.[14]

2.5.3.2. Multiple specifiers

We have also seen that the distribution of maximal projections can be the basis for postulating functional heads. For instance, we may observe that there is a need for two specifier positions in a particular domain. Assuming that a lexical head can have only one specifier, then, if there is a second specifier position, we are led to assume that there will be a second functional head. However, this argumentation can also be challenged. In particular the restriction that each head has one specifier is not universally accepted and it has been proposed that a head might have more than one specifier. For instance, Koizumi (1995: 141) proposes that the CP domain contains one functional projection PolP, 'Polarity Phrase'. Pol selects IP as its complement; the head Pol can host a number of different features. Each feature requires checking and if each feature is associated with the EPP property, then this leads to multiple movement and to multiple specifiers. The checking features of Pol are hierarchically ordered: the focus-feature or the wh-feature is checked in the inner specifier and the topic feature is checked in the outer specifier. In (25a) the complementizer *che* ('that') is followed first by a topicalized constituent *a Gianni* ('to Gianni'), which is followed by a focused constituent, *il tuo libro* ('your book') and followed by an adjunct of time *domani* ('tomorrow'). It could be argued that a head Pol takes IP as its complement and that this head hosts the relevant features (FOCUS, TOPIC etc) to attract the constituents in the left periphery. Similarly, in French (25b) the topicalized constituent *ce livre-là* ('that book') precedes the focused interrogative constituent *quand* ('when'). Again Pol could be argued to have a TOPIC feature and a FOCUS feature. Thus in both (25a) and (25b) Pol would have multiple specifiers.

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[14] The question whether clausal agreement projections should be admitted has not been given a final answer. For arguments in favor of agreement projections see also Belletti (2001), Guasti and Rizzi (2002), Neidle and MacLaughlin (2002), Pollock (2006: 644, note 25).

(25) a. Dicono che a Gianni IL TUO LIBRO domani gli dovremmo dare

                    (Italian)

   they say that to Gianni YOUR BOOK tomorrow him we-should give

   'They say that tomorrow YOUR BOOK we should give to Gianni.'

  b. Ce livre-là, quand l'as-tu acheté ?   (French)

   This book there, when it have you bought

   'This book, when did you buy it?'

In this way the system ensures that more than one maximal projection is associated with the CP domain without associating each moved constituent with a separate head. Rather than having an array of functional projections in the CP domain, as proposed by Rizzi (1997), and summarized in (21c) above, there is just one single head with multiple specifiers. The hierarchical organization of feature checking in the C-domain mimics the hierarchy of the functional projections postulated above.

2.6.   Deriving variations in linear order

2.6.1. *Cross-linguistic variation in linear order*

So far we have mainly used data from English and French in which typically the head precedes the complement. For instance, a verb precedes the direct object. However, it is well known that languages vary with respect to the relative positions of heads and their complements. We have already discussed the difference in word order between languages and to account for that we have used head movement (see (18)). Observe that apart from differing in V-movement, English and French are similar in the unmarked positions of subject (*Nelson*, object (*biscuits, des croquettes*), and the frequency adverb (*toujours, always*). The unmarked order is always subject >adverb>object. The unmarked order is also that in which the verb (and the VP) follows the auxiliary:

(26) a. Nelson has always eaten biscuits.

  b. Nelson a toujours mangé des croquettes.   (French)

   Nelson has always eaten biscuits

However, other languages display other orders. For instance, Dutch embedded clauses display the order object-verb, and the auxiliary may also follow the verb:

(26) c. Dat Nelson altijd koekjes gegeten heeft
 that Nelson always biscuits eaten has
 'That Nelson has always eaten biscuits.'

One approach to such cross-linguistic variation has been to propose that there is parametric variation in the directionality of the projection schema and that the structure of Dutch is to some extent the mirror image of English and French. More precisely, it has been proposed that the X-bar schema as elaborated in section 2.2. (see (9)) only specifies hierarchical relations, and that it does not provide information concerning linearity. Thus the schema in (9), should in fact be read as allowing both specifier-head order and head-specifier order, and as allowing both head-complement order and complement-head order. It is proposed that the ordering variation is a matter of parameter setting. Thus it could be said that in English specifiers consistently precede their heads, complements consistently follow them and that in Dutch there is some variation: while C, D and P, for instance, precede their complements, I and V follow them.[15]

(27) a. English; Dutch CP, DP,PP: b. Dutch IP and VP:

       XP   XP

Spec   X'   Spec   X'

         X   complement   complement   X
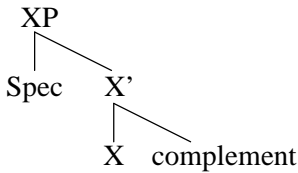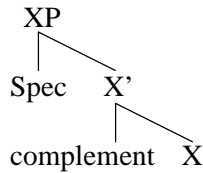
Implementing this variation on the structure of the clause, for instance, we could then end up with the structure in (27c) for Dutch. (27c) is very sketchy. In particular we leave aside all articulation in the TP domain, we leave aside VP-shells, we insert the auxiliary in T and we adjoin the adverb to VP.

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[15] Needless to say, the fact that one has to stipulate which projections are head initial and which are head final is not attractive.

(27) c.

```
                    CP
              ┌──────┴──────┐
              C             TP
                      ┌──────┴──────────┐
                     DP                 T'
                              ┌──────────┴──────────┐
                             VP                     T
                        ┌─────┴─────┐
                       Adv          VP
                               ┌─────┴─────┐
                              DP          V'
                                     ┌─────┴─────┐
                                    DP           V

    dat   Nelson  altijd  N̶e̶l̶s̶o̶n̶  koekjes  gegeten  heeft
```
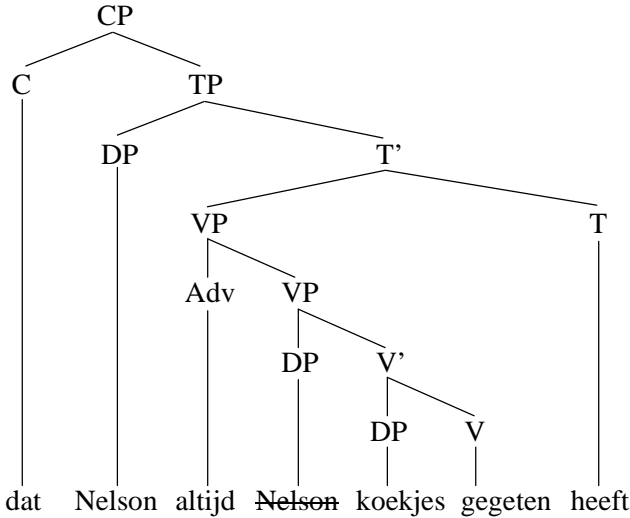
Consider now the Malagasy examples (28a), taken from Pearson (1998: 2), his (8), and (28b) taken from Rackowski & Travis (2000: 120), their (6):

(28)   a.   Nijinja vary tsara ny mpamboly.
             past-cut rice well det farmer
             'The farmer harvested rice well.'

       b.   Manasa lamba tsara Rakoto.
             wash clothes well Rakoto
             'Rakoto washes clothes well.'

What is striking about these examples is that the verbs (*nijinja* ('cut'), *manassa* ('wash')) are sentence-initial and that we find the order object-adverb-subject. We might wish to derive the Malagasy examples by V-movement. However, simple verb movement is not sufficient since this will not give us the right ordering of object-adverb-subject. In fact, with respect to the relative order of the non-verbal constituents in the clause, Malagasy presents the mirror image of English and French. One might once again propose that there is parametric variation in the directionality of the projection schema and that the structure of Malagasy is the perfect mirror image of English and French. Thus while English (and French) have the ordering in (29a), Malagasy would have (29b):

(29) a. XP
          Spec   X'
                  X   complement

    b. XP
          X'   specifier
          complement   X

Implementing this variation on the structure of IP, for instance, we end up with the structure in (30a) for a consistently right-branching language, and with that in (30b) for a consistently left branching language. We simplify the structure by ignoring the split IP and VP-shells.

(30) a. TP
          DP   T'
                T   VP
                     DP   V'
                           V   DP

    b. TP
          T'   DP
          VP   T
          V'   DP
          V   DP
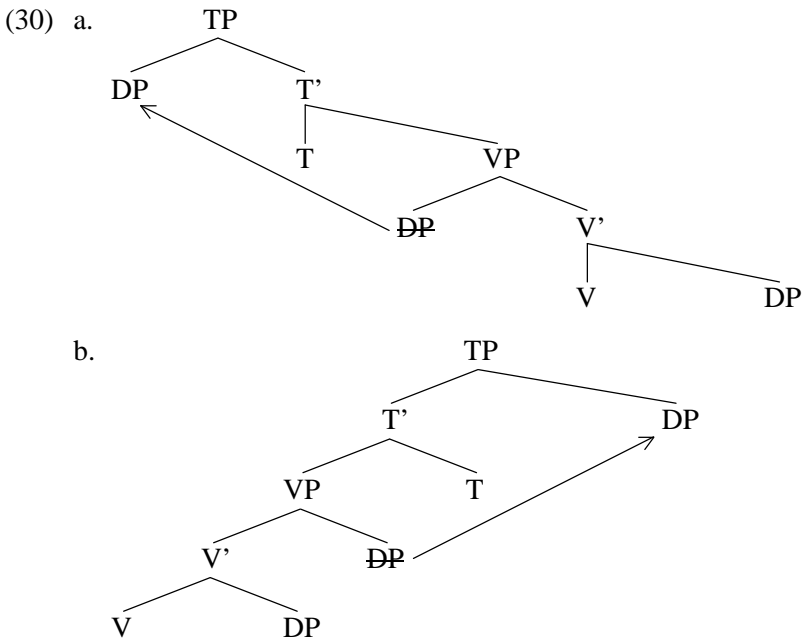
If we also assume that the Malagasy subject DP moves rightward, from SpecvP into SpecTP then example (30a) would fit the right-branching structure in (30b).

2.6.2. Antisymmetry and linear order

As an alternative to the directionality parameter to account for linearization differences between languages, Kayne (1994) proposes the universal base

hypothesis, the proposal that the system builds up identical structures across languages and that the universal schema is the X-bar format presented in section 2.2. (9).[16] All variation in linear order is derived by movement. Let us first briefly summarize the essence of his proposal.

2.6.2.1. *Antisymmetry*

Kayne proposes that linear ordering is fully determined by structural hierarchy. His Linear Correspondence Axiom (LCA) states that only antisymmetric relations are admitted between nodes in a structure, hence the label 'antisymmetry'. This means that if a node α c-commands node β then β must not c-command α.[17] Mutual c-command between two nodes is symmetric, violating antisymmetry. Structural c-command maps into a left-right linear ordering. Hence, specifier head and head complement are the only possible base orders, and all variation in which, say, a head precedes a specifier and a complement precedes a head are derived by movement. Moreover, since a moved element targets a c-commanding position, all movement is to the left. Thus neither the base structure in (30b) nor the required rightward movement of the subject would be admitted under his view (for discussion see Beerman et al 1997). The derivation of the English pattern is not problematic, nor is that of French, in which we continue to assume that V moves to an inflectional head.

2.6.2.2. *Deriving OV-orders*

Assuming the X-bar framework as in (9) above for Dutch has the advantage that we no longer need to stipulate which projections are head initial (CP, DP, PP) and which are head final (IP, VP): all projections are head initial. However, how would we derive the order of Dutch embedded clauses in which the object precedes the verb? There have been a number of proposals in the literature, and for reasons of space we cannot elaborate them all. Here we will just look at the derivation of the OV order.

  One proposal is that the OV order in Dutch (and German) is derived by the movement of the object to the right. One implementation of this idea is to propose that the object DP moves to the outer specifier of vP. Thus in

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[16] Kayne does not allow for adjunction or for multiple specifiers.
[17] For the concept 'c-command' see section 2.2.

(31a), the direct object *koekjes* ('biscuits') originates to the right of V and moves leftward, as schematically presented in (31b). Observe that the sentence-final position of the verb suggests that it remains VP-internal (see Zwart 1993, 1996, 1997 for detailed proposals):

(31) a. Dat Nelson altijd koekjes eet.
      that Nelson always biscuits eats
    b. [$_{CP}$ dat [$_{TP}$ Nelson [$_{vP}$ altijd [$_{vP}$ koekjes [$_{vP}$ ~~Nelson~~ eet [~~koekjes~~]]]]]]

In independent work, Hinterhölzl (2000), Pearson (1998, 2000), Koopman and Szabolcsi (2001) and Haegeman (2000, 2001) have elaborated an alternative proposal to derive the OV order in Dutch and German. The accounts involve a double movement. Rather than assuming that SOV orders reflect a low V-position with movement of the complement to a leftward position, they propose that the OV order is derived by

(i)   movement of the finite verb to a functional head in the I domain
(ii)   'remnant' movement of the (extended) projection of V to a specifier position

The second step of the derivation is called 'remnant movement' because the movement affects a 'remnant', i.e. it affects a projection from which a constituent (here the head V) has been moved first. Below is a schematic representation. The structure is simplified for expository reasons. In (31c) V *eet* moves to F, a functional head in the IP domain. In (31d) the remnant projection moves to the specifier position of the inflectional projection headed by F. Continuing to assume for expository reasons that adverbials may adjoin to vP, we label the remnant projection vP. Furthermore, the subject DP *Nelson* will have to move to a higher position. This is shown in (31e).

(31) c. dat [$_{FP}$ [$_{F}$ eet]
                  [$_{vP}$ altijd [$_{vP}$ Nelson [$_{V}$ ~~eet~~] koekjes]]]
    d. dat [$_{FP}$ [$_{vP}$ *altijd* [$_{vP}$ Nelson [$_{V}$ ~~eet~~] *koekjes*]] [$_{F}$ eet]
                  [$_{vP}$ ~~altijd~~ [$_{vP}$ ~~Nelson [eet] koekjes~~]]]
    e. dat [Nelson [$_{FP}$ [$_{vP}$ *altijd* [$_{vP}$ ~~Nelson~~ [$_{V}$ ~~eet~~ *koekjes*]] [$_{F}$ eet]
                  [$_{vP}$ ~~altijd~~ [$_{vP}$ ~~Nelson [eet] koekjes~~]]]]

How can we derive the word order pattern in a language like Malagasy, illustrated in (28)? Recall that in this language the line-up of the constituents

of the clause is the mirror image of that found in English. We will not provide a precise or detailed analysis, here, but we will simply show the spirit of an analysis in terms of Kayne's antisymmetry.

We assume the X-bar format in (9a), with all projections head-initial, and with specifiers to the left of the X' constituent. If for Malagasy we adopt the English type of derivation with the subject moving to the highest A-position, the specifier of TP, and the verb remaining in V, then we would end up with the order in (32a), clearly not what we want.

(32) a. *[TP Ny mpamboly [vP tsara [vP ~~ny mpamboly~~ nijinja vary]]]
          the farmer   well   cut   rice

If in addition to moving the subject to the higher specifier position, we also move the verb to the highest inflectional head, as happens in French (see example (18b)), we get (32b), also not the desired order.

(32) b. *[TP Ny mpamboly [T nijinja] [vP tsara [vP ~~ny mpamboly~~ ~~nijinja~~ vary]]]

As a third alternative, we might propose that V moves while the subject DP remains VP-internal, but then we get the order in (32c).

(32) c. *[TP [T Nijinja] [vP tsara [vP ny mpamboly ~~nijinja~~ vary]]]

Again, though the verb is now indeed initial, this derivation does not produce the desired order, notably, the subject *ny mpamboly* now incorrectly precedes the object *vary*, and the object incorrectly follows the adjunct *tsara*. One option would be to propose that the object *vary* first moves to a position to the left of the adjunct *tsara*.

(32) d. [TP [I Nijinja] [vary [vP tsara [vP ny mpamboly ~~nijinja vary~~]]]]

This movement of the object might at first sight be argued to instantiate object shift as also found in Icelandic and illustrated in (19c,d), repeated here in (33).

(33) a. Hann las ekki baekur.   (Icelandic)
          he reads not books
          'He doesn't read any books.'

      b. Hann las baekurnar ekki.   (Icelandic)
          he read the books not
          'He doesn't read the books'

However, there is a problem with the proposal that the Malagasy object undergoes object shift. In the Malagasy example, object shift of *vary* ('rice') would have to move an indefinite object past the manner adverb *tsara* ('well'). In languages exhibiting object shift, such as Icelandic, it is typically the definite object which undergoes object shift, as shown by the contrast in (33): in (33a) the indefinite object *baekur* ('books') remains to the right of the sentential negator *ekki.*

    Indeed, the proposed movement of the indefinite object in Malagasy (32d) becomes even more questionable when we compare this example with (34), in which the object *ny vary* ('the rice') is definite. As can be seen, the definite object *ny vary* occupies a position to the left of the subject and to the right of the manner adverb *tsara*.

(34) a. Nijinja tsara ny vary my mpamboly.   (Pearson 1998: 3)
          cut   well the rice the farmer

In our derivation, this would have to mean that the definite object has moved to a position to the immediate left of the subject and to the right of the manner adverb:

(34) b. [$_{TP}$ [$_I$ Nijinja] [$_{vP}$ tsara [$_{vP}$ ny vary [$_{vP}$ ny mpamboly ~~nijinja ny vary~~]]]]

While this derivation does produce the desired order, it goes against most assumptions as to the motives for object shift. As shown by the contrast in (19c,d) repeated here in (33), in general, in languages with object shift, indefinite objects occupy a lower position (33a) than definite objects (33b). This is usually related to their interpretation, definite objects expressing some 'given' entity (Diesing 1996, 1997). We will not elaborate the details of the analyses of this phenomenon here. Again then, we should say that somehow object shift in Malagasy is the mirror image of object shift in Icelandic.

    If we continue to assume with Kayne (1994) that only left branching is possible, further examination of additional examples raises more problems.

Suppose we take a sentence with two adverbials in the TP domain between subject and verb. In French the unmarked order of such adverbials is that the frequency adverbial *toujours* ('always') precedes the manner adverb *bien* ('well') and this pattern is generally the unmarked case. For extensive discussion of adverbial order see Alexiadou (1997) and Cinque (1999).

(35)   a.   Le paysan coupe toujours bien le riz.
            the farmer cuts always well the rice

The Malagasy example (35b) seems to present the mirror image of French (35a).

(35)   b.   Nijinja vary tsara foana ny mpamboly.
            cut rice well always the farmer   (Pearson 1998: 27)

In Malagasy, the frequency adverbial *foana* ('always') follows the manner adverbial *tsara* ('well'). It is hard to see how this order can also be derived. Suppose, following proposals by Alexiadou (1997) and Cinque (1999), that adverbials are not simply vP adjoined, as we have been implying so far, but that they are associated with specific functional projections. Let us say that the adverbial of frequency is associated with an aspectual projection and that the manner adverbial is associated with a manner projection (or, possibly, with VoiceP/vP). Using the mechanism which successfully derived (32d) we would still end up with the reverse order, as shown in (35c).

(35)   c.   *[TP [T Nijinja] [vary [AspP foana
                                [vP tsara [vP ny mpamboly nijinja vary]]]]]

To derive the desired pattern and assuming that adjuncts display a universal hierarchy which is reflected by their position as specifiers of functional heads, we would now have to propose that *tsara*, the manner adverb, also moves leftward, to a position lower than the moved indefinite object.

(35)   d.   *[TP [I Nijinja] [vary [tsara [AspP foana [vP tsara
                        ←—————————————
                                [vP ny mpamboly nijinja vary]]]]]]

Indeed, from the consideration of additional empirical data it turns out that we have somehow always to reorder all clausal constituents in Malagasy.

For instance, in the double object construction associated with ditransitive verbs such as *give*, the indirect object DP usually precedes the direct object DP as shown by the examples in (36). As shown by (37), Malagasy again exhibits the opposite order:

(36) a. English   John gave Nelson biscuits.
      b. Dutch   Jan gaf Nelson koekjes.
                     John gave Nelson biscuits

(37) Nanolotra ny dite ny vahiny ny zazavavy.   (Pearson 1998: 2, his (2a))
      PAST-offer the tea the guest the girl

Again, to derive (37) we will have to assume that the direct object DP is obliged to move past the indirect object DP, a pattern which is again most unusual.

   In the various proposals above we have applied the two types of movement; (i) head movement affecting V and (ii) XP movement affecting a constituent of VP or of the clause, such as an object DP, or an adjunct or a subject. A combination of such movements was also often used. Though we were able to derive the correct linear orders, each derivation presented us with an exceptional situation. Notably, definite objects have to remain lower than indefinite ones, adverbs reorder with respect to each other, and direct objects must move higher than indirect objects. This type of derivation does have the advantage of preserving the universal base hypothesis, but it is unsatisfactory because we require a whole range of unexpected additional movements.

   Pearson (1998, 2000), Rackowski & Travis (2000) and Travis (2006) propose an alternative derivation for the Malagasy data. We will present the spirit of their analyses here. Observe that the presentation below does not correspond to the exact analyses cited. What we want to do is to merely illustrate in broad lines the alternative proposal as introduced in the papers referred to. For the detailed and accurate implementation elaborated by the authors we refer to their own papers. What we need to achieve is that the verb is in initial position and that all constituents end up in the reverse pattern. Leaving out details which would complicate the picture somewhat, the essence of Pearson's proposal is that the initial V-position is not derived by head movement of V, but rather that the pattern in Malagasy is derived by the movement of maximal projections, that is VP and extended projections of VP.