

ORIGINS OF PHRASE STRUCTURE

by

TIMOTHY ANGUS STOWELL

B.A., University of Toronto
(1976)

M.A., University of Toronto
(1977)

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Signature of Author *Timothy Stowell*
Department of Linguistics and Philosophy
1981

Certified by *Noam Chomsky*
Noam Chomsky
Thesis Supervisor

Accepted by *Samuel Jay Keyser*
Samuel Jay Keyser
Chairman, Departmental Graduate Committee

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TIM STOWELL

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requirements for the degree of Doctor of Philosophy

ABSTRACT

At a descriptive level, it is a trivial observation that each speaker of a human language knows that words in sentences are organized into classes of hierarchically-defined phrases, each with distinctive clusters of properties pertaining to internal structure and external distribution. The significant empirical question for the theory of phrase structure concerns the form in which this knowledge is represented in the mind.

Within the scientific tradition of generative grammar, it has commonly been assumed that a large part of this knowledge is encoded into the formulae of context-free rewrite rules belonging to the Categorical component of the Base. These Categorical rules are supposed to define the idiosyncratic properties of the phrases of each syntactic category: noun phrases, verb phrases, adjective phrases, etc. Although this rule system has proved to be a valuable heuristic tool for identifying and formulating various properties of phrase structure that must be accounted for by the theory of grammar, it suffers from serious problems of explanatory adequacy if it is understood as a hypothesis about the actual structure of linguistic knowledge in the mind.

The major claim of this thesis is that the component of Categorical rules does not exist, and that its major empirical effects can be deduced from other components of grammar. In particular, the assignment of syntactic Case is assumed to observe a strict condition of adjacency, which plays an important role in determining the linear arrangement of certain combinations of subcategorized complements. This condition interacts with a principle that prevents certain syntactic categories from being assigned Case to derive a number of complex properties associated with a variety of clausal complement structures.

The elimination of the Categorical component and the adoption of the adjacency condition on Case assignment forces quite radical departures from previous assumptions about several syntactic constructions. In some cases, it is necessary to reinterpret certain constituents that have traditionally been analyzed as independent phrases as actually being

incorporated within the structure of a lexical head by rules of word-formation. This has interesting consequences for the theory of the interaction between the word-formation component of the grammar and the hierarchical phrase structure configurations defined by the category-neutral X-bar system. In addition, the extended component of word-formation forms the basis for an account of the distribution of certain marked constructions involving Reanalysis rules in various languages.

The principles of phrase structure and Case assignment also interact in complex ways with the assignment of thematic roles to arguments. A formalization of thematic role assignment is developed, providing the basis for a possible explanation for the apparent grammatical equivalence of superficially distinct structures of proper government of empty categories. The theory of thematic structure proposed here allows for a restrictive theory of the encoding of strict subcategorization requirements, and leads to a revision in the syntactic analysis of the categorial identity and X-bar structure of various types of clauses.

Thesis Supervisor: Noam Chomsky

Title: Institute Professor

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CHAPTER ONE: THE CATEGORIAL COMPONENT

1. The Aspects Theory

1.1 Within the scientific tradition of generative grammar, the structural and distributional properties of syntactic phrases have usually been assumed to be determined by the categorial component of the base. As a point of departure, let us consider the formal nature of the base rules in the "Standard Theory", as set forth in Chomsky (1965), henceforth *Aspects*. According to this theory, the categorial component consisted of a set of context-free rewrite rules, each conforming to the scheme in (1):

$$(1) \quad X \rightarrow \dots Y \dots$$

In (1), X is a single term designating a nonterminal element (i.e. a phrasal constituent). The material on the right side of the arrow is the expansion of the rule; it consists of a string of at least one non-null element.

The categorial rule-system defined both hierarchical structure and linear order. Each rule accounted (partially) for the external distribution of the terms appearing in the expansion and defined the internal structure of the term appearing to the left of the arrow. Consider, for instance, the fragment of the categorial component proposed by Chomsky in *Aspects*:¹

- (2) i. $S \rightarrow NP - \text{Predicate Phrase}$
 ii. $\text{Pred. Phrase} \rightarrow \text{Aux} - \text{VP} - (\text{Place}) (\text{Time})$

- iii.
$$VP \rightarrow \begin{cases} \text{Copula - Predicate} \\ V - \begin{cases} (NP) (Prep-Phrase) (Prep-Phrase) (Manner) \\ S' \\ \text{Predicate} \end{cases} \end{cases}$$
- iv.
$$\text{Predicate} \rightarrow \begin{cases} \text{Adjective} \\ (\text{like}) \text{ Predicate-Nominal} \end{cases}$$
- vii.
$$NP \rightarrow (\text{Det}) N (S')$$
- xvi.
$$\text{Aux} \rightarrow \text{Tense (M) (Aspect)}$$

In (2), the external distribution of NP is accounted for by rules (i) and (iii): (i) states that NP appears as the first term in the expansion of S, and (iii) states that NP appears optionally as the second term in one of the expansions of VP. The internal structure of NP is accounted for by rule (vii).

Among the elements appearing on the right-hand side of the rules in (2) are preterminal elements which correspond to lexical categories: for instance, in (vii), N corresponds to the lexical category of nouns. In the *Aspects* theory, the base contained another set of rules, called strict subcategorization rules, which replaced the preterminal symbols designating lexical categories with complex symbols consisting of matrices of syntactic features.² By convention, the local syntactic environment of the lexical symbol was encoded into the complex symbol in the following way: given a categorial rule of the form $X \rightarrow WYZ$, a strict subcategorization rule applying to Y would create a complex symbol containing the environment $W - Z$; given a rule of the form $X \rightarrow Y(Z)$, the complex symbol replacing Y would be either $-Z$ or $-\emptyset$, depending upon the option exercised in the previous application of the categorial rule.

The third rule system of the base component was that of lexical insertion. The set of lexical entries for each syntactic category (verbs, nouns, adjectives, etc.) were divided into subcategories, each of which corresponded to a complex symbol introduced by the strict subcategorization rules. Lexical insertion depended upon a match between the subcategorial features of the verb and those of the complex symbol it replaced. Thus transitive verbs had the subcategorial feature [$-NP$](among others); this allowed them to be inserted in place of a complex symbol containing this feature.

Thus the representations of sentences which were generated by the base were derived by (i) the phrase-structure rules of the categorial component, (ii) the strict subcategorization rules, and (iii) lexical insertion.³

1.2 In addition, two other rule systems played a part in determining properties of phrase structure. The first of these was the set of lexical redundancy rules which operated on strict subcategorization frames. These rules accounted for generalizations about subcategorization which could not be stated by the rules of the categorial component. We will not consider these rules in detail here, although we will discuss them briefly later on.

The other rule system was the set of transformations, which mapped the output of the base component into surface structure representations. In the Standard Theory, the expressive power of these rules was very rich; they took as their input strings of terminals, nonterminals, and labelled brackets, and effected structural changes in the form of substitutions, deletions, and adjunctions.

The rich expressive power of the transformational component, combined with the expressive power of the categorial rules of the base, allowed for many possible formal accounts of phrase structure. To take one example, consider the fact that adjectives appear in prenominal position in a noun phrase:

- (3) a. [the old man], [several beautiful children]
 b. *[the man old], *[several children beautiful]

One possible representation of this fact would be in the form of a base rule such as (4):

- (4) $NP \rightarrow \dots A - N \dots$

But, given the existence of a transformational component, the prenominal position of adjectives could be due to a transformational rule; in other words, the base rule might actually be (5), if there were a transformational rule such as (6):

- (5) $NP \rightarrow \dots N - A \dots$

- (6) $X - N - A - Y$

1 2 3 4 SC: 1 - 3+2 - \emptyset - 4

Rule (6) takes the output of (5) as its structural analysis; it changes this by adjoining the third term (the adjective) to the left of the second term (the noun). The string (i.e. the linear arrangement of constituents) produced by (5) and (6) combined is equivalent to that produced by (4) alone.

In choosing between two hypotheses about a particular construction, the overall complexity of the grammar would be taken into account. Although (4) in itself is simpler than (5) and (6) combined, other aspects

of the structure of the grammar might be invoked to justify the transformational solution. It is worth considering what kind of evidence could be brought to bear on an issue of this sort.

Suppose that linguistic theory allows for two accounts of a particular property of grammar, given an accidentally-determined corpus of data. Further evidence choosing between the accounts may be divided into two classes: (i) evidence which the child makes use of in the development of his/her grammar, and (ii) evidence which the child does not have access to -- or at least does not necessarily make use of -- but which nevertheless chooses between the two accounts. Although it is very common in the literature for the distinction between these two classes of evidence to be overlooked, perhaps because it is not always obvious what a child does make use of during the period of acquisition, it is important to keep the two notions distinct.⁴ Only evidence of type (i) plays a direct role in acquisition; this is the crucial contribution of the environment which combines with the predetermined structure of the language faculty in the development of the mature (adult) grammar. The significance of evidence of type (ii) for the scientific study of grammar is that in choosing between two hypotheses, it shows that some innate property of the mind (presumably a principle of the language faculty), or else some piece of evidence of type (i), must be leading the child to develop the grammar consistent with this evidence.

Consider now the choice between the two analyses of the placement of adjectival modifiers in prenominal position, in the context of the preceding discussion. (Recall that both of these are consistent with the overall structure of the *Aspects* theory.) Suppose that the child, in developing a subpart of the grammar to account for the position of nominal

modifiers, takes into account evidence such as (7) as well as that of (3):

- (7) a. [the man [angry at his brother]]
 b. [several houses [whiter than snow]]

On the basis of (7), the child presumably develops a rule such as (8):

- (8) $NP \rightarrow \dots N - (AP) \dots$

In other environments, A and AP have the same external distribution:

- (9) a. John seems [(very) angry (at me)]
 b. This potion will make you [(even) smarter (than Einstein)]

So there would be independent motivation for a categorial rule such as (10):

- (10) $AP \rightarrow (\dots) A (\dots)$

Now there was an implicit assumption in evaluation metric of the Standard Theory that the language faculty places a higher cost on additional base rules than it does on additional transformational rules. Therefore if simple adjectives were derived by the categorial rule expanding AP (10), then it followed that either (4) or (8) could be eliminated, while a transformational rule would be added -- either a simple adjective preposing rule (6), or a rule postposing complex APs. At this point, evidence from (11) comes into play:

- (11) a. [the book [with a green cover]]
 b. [some chairs [needing a paint job]]
 c. [the boy [I met in Kansas]]

Exposure to data like (11) would lead to the development of base rules for these types of modifying phrases, which never appear prenominaly:

- (12) a. $NP \rightarrow \dots N - (PP) \dots$
 b. $NP \rightarrow \dots N - (\text{Participial Phrase}) \dots$
 c. $NP \rightarrow \dots N - (S) \dots$

The Standard Theory also had a quite explicit assumption that the evaluation metric favored collapsing rules by means of braces, where the terms in the braces were expanded disjunctively. Now (12a-c) could be collapsed into a single rule which could also subsume (8):⁵

$$(13) \quad NP \rightarrow \dots N - \left\{ \begin{array}{l} PP \\ \text{Prt } P \\ S \\ AP \end{array} \right\}$$

But (4) could not be collapsed with this rule, since the adjective appears to the left of the head noun; therefore the analysis assuming a single base rule for nominal modifiers (13) and a transformational rule (6) would be preferred.

Actually, another consideration would have led the child to the same conclusion, according to the *Aspects* theory. Recall that the rules of semantic interpretation (the projection rules, in the terminology of the Standard Theory) were assumed to operate on deep structure representations. Now many of the arguments for transformational rules rested on the assumption that markedness theory attaches a high cost to duplication of projection rules in deriving a given semantic representation from multiple syntactic representations. Applying this style of argument to nominal modifiers, it could be argued that a single projection rule could apply to all nominal modifiers if they consistently appear in postnominal position at Deep structure, whereas at least two such rules would be required if simple adjectives appear in prenominal position in the base.⁶ Hence the theory containing the transformational rule (6) would again be preferred.

1.3 To what extent could it be said that it was the categorial component

which determined the structural organization of phrases in the *Aspects* theory? Strictly speaking, this is accurate, inasmuch as it was the rules of this component that formed the generative core of the grammar; they derived the set of Deep Structure configurations which -- mediated by the transformational component -- were mapped into Surface Structure representations of phrases.

In certain respects, however, this was not really accurate. For one thing, actual Surface Structure representations were profoundly affected -- and to a large extent determined -- by the transformational rules. It was characteristic of Standard Theory analyses to attribute virtually all of the complex structural properties of a given construction to specific terms or conditions of a particular transformation. Subsequently, the Generative Semantics tradition pursued this style of analysis to the point where the categorial component accounted for virtually nothing.

Second, the very existence of projection rules called into question the need to use phrase structure rules to account for constituent order in many cases. Consider, for instance, the question of the base order of adjectival modifiers in NP. Suppose that the categorial component allowed for APs and other modifiers to appear anywhere in NP. If the projection rule for restrictive modifiers required the restricting phrase to appear in postnominal position, then this rule would serve a filtering function which would render the base rule superfluous: only those derivations with the modifier in postnominal position at deep structure would yield a coherent logical representation. In this sense, the categorial component would generate the phrase structures in question, without actually "accounting for" them. Thus even in the *Aspects* model,

the seeds of a modular account of phrase structure lay hidden.

2. X-Bar Theory and the Lexicon

2.1 One rather serious gap in the Standard Theory was its lack of a theory of redundancy rules for the categorial component, apart from the formal abbreviatory conventions for collapsing rules mentioned above. The base component was incapable of accounting for internal structural properties that are shared by two or more phrases of distinct categories (eg. NP and VP). Cross-categorial generalizations could only be captured by attributing shared properties to a single Deep Structure representation from which the distinct phrases would be derived. Any structural differences distinguishing the phrases at Surface Structure had to be attributed to the effects of transformational rules.

The classic example of a cross-categorial structural parallel involves action-denoting NPs, headed by nouns that are morphologically related to semantically parallel verbs:

- (14) a. The enemy destroyed the city
- b. The city was destroyed (by the enemy)
- (15) a. [the enemy's destruction of the city]
- b. [the city's destruction (by the enemy)]

Although (14a,b) are sentences, while (15a,b) are noun phrases, they share a number of properties. In each case, the agent noun phrase appears in "subject" position in the active phrase, and in the *by*-phrase in the passive counterpart. In each case, the patient noun phrase appears as a subcategorized object in the active phrase, and as a "subject" in the passive counterpart. All four phrases refer to the same action, and the selectional restrictions of *destroy* and *destruction* are identical. In the theory of transformational grammar, this could only mean one thing. Markedness theory would force the child to relate (14) and (15) trans-

formationally, presumably by deriving (15) from (14) by a Nominalization transformation, as proposed by Lees (1960).⁷

Structural parallelisms of this sort are in fact quite pervasive, and not limited to action nominalizations of this sort. The same sort of phenomenon appears with agent nominals (16), modal nominals (17) and adjective-based nominals (18):

- (16) a. Someone killed his brother
His brother was killed
- b. [the killer of his brother]
[his brother's killer]
- (17) a. Someone can read this book
This book can be read
- b. [the readability of this book]
[this book's readability]
- (18) a. It is likely that Jim will come
Joe got angry with me
- b. [the likelihood that Jim will come]
[Joe's anger at me]

Once again, the Standard Theory took the full sentences in (16-18a) as the Deep Structure representations of (16-18b), since the only possible account of the structural parallels holding between them was in terms of transformational derivations from a common source.

However, Chomsky (1970) showed that this paradigm of explanation was ultimately bankrupt. Chomsky pointed out that the transformational rules invoked in these accounts were notoriously unproductive, and that their phonological and semantic effects were entirely unpredictable. Moreover, alongside the derived nominals in (15-18), there are nominals with exactly parallel internal structure for which no plausible non-nominal Deep Structure source can be posited:⁸

- (19) a. [John's habit of interrupting]
- b. [the author of the book]

- c. [the prowess of the athletes]
- d. [Joe's antipathy toward me]

The special significance of the cases in (19) is that they show that any attempt to capture the cross-categorical parallelisms of (15-18) in transformational terms comes at the cost of losing any account of structural regularities holding across noun phrases.

2.2 Chomsky solved this dilemma by introducing what amounted to a theory of redundancy rules operating in the categorial component of the base, together with a refinement of the theory of the lexicon. The categorial redundancy rules took the form of the X-bar convention, which provided a means of expressing significant generalizations about phrase structure which cut across categorial distinctions. Specifically, Chomsky's suggestion was that there were general rules accounting for a large part of the phrase structure of all lexical categories, as in (20):

- (20) a. $\bar{\bar{X}} \rightarrow [\text{Spec}, \bar{X}] \bar{X}$
 b. $\bar{X} \rightarrow X \dots$

In (20a), $\bar{\bar{X}}$ refers to a complete categorial phrase, such as NP, VP, or AP, which are now interpreted as \bar{N} , \bar{V} , and \bar{A} , respectively.⁹ The crucial insight behind this innovation was that the categorial identity of a given phrase could be characterized independent of its hierarchical status. By using a categorial variable (X) it was possible to express the fact that all major categorial phrases consisted of a specifier phrase and another constituent comprising the rest of the material in it. Chomsky suggested that there were separate rules determining the structure of SPEC for each category: for \bar{N} , the determiner system; for \bar{V} , the auxiliary system; and for \bar{A} , the system of preadjectival modifiers.

Similarly, the subject of a sentence could be characterized as an NP specifier of S, while the genitive subject of a noun phrase was simply a specifier of NP.

Rule (20b) defines the internal structure of the rest of the phrase -- \bar{X} . In each case, X represents the lexical head of the phrase, and "... " is an abbreviation for the set of complement frames which may appear after the head. Thus the NP following a transitive verb and the *of*-NP following a derived nominal could both be defined as the object of the head X .

The second innovation which "Remarks" introduced was a refinement of the conception of the lexicon. Specifically, Chomsky suggested that derived nominals such as *decision*, *destruction*, *criticism*, etc. be listed in the lexicon, where their idiosyncratic phonological and semantic properties could be specified, case by case. However, to express the fact that derived nominals usually share the strict subcategorization and selectional features of the related verbs, Chomsky proposed that each verb-noun pair forms a single lexical entry, unspecified in terms of syntactic category. By convention, lexical insertion would choose the nominal form to fill the N position in a noun phrase, while the verbal form of the entry would be inserted in the head position of \bar{V} . Thus the properties of strict subcategorization and selection, which referred to structural positions such as "subject" and "object" (which, under the X-bar theory of the base, were now defined in terms which abstracted away from syntactic categories) were properties of the lexical entry as a whole.¹⁰

Consider again (14,15). In the "Remarks" theory, both *destroy* and *destruction* would constitute a single lexical entry. The entry had the subcategorization feature [— NP], which is realized in both (14a) and (15a). Selectional features requiring that the object be [-ABSTRACT]

would be stated once, on the shared subcategorization frame.¹¹ Finally, the passive transformation would be formulated in X-bar terms, so that (15b) would be derived directly from (15a), just as (14b) is from (14a). An analogous story applied to (16-18); in each case, cross-categorical parallels were captured in terms of X-bar theory and the revised theory of the lexicon, while differences between S and NP were attributed to idiosyncratic differences in the categorial rules deriving them.

3. Categorial Distinctive Features

3.1 A third innovation of "Remarks" was to reinterpret categories in terms of syntactic features, rather than as names for classes. Recast in these terms, the categories "might be a reflection of a deeper feature structure, each being a combination of features of a more abstract set. In this way, the various relations among these categories might be expressible."¹² In later work, Chomsky (1974) proposed an explicit theory of syntactic features from which the major lexical categories could be derived. This system is summarized in (21):

- (21) [+N] (nouns, adjectives)
 [-N] (verbs, prepositions)
 [+V] (verbs, adjectives)
 [-V] (prepositions, nouns)

Thus the lexical categories are redefined as follows:

$$(22) \quad \begin{array}{ll} N = \begin{bmatrix} +N \\ -V \end{bmatrix} & A = \begin{bmatrix} +N \\ +V \end{bmatrix} \\ V = \begin{bmatrix} -N \\ +V \end{bmatrix} & P = \begin{bmatrix} -N \\ -V \end{bmatrix} \end{array}$$

Combined with the hierarchical innovation of the X-bar system, this led

to a redefinition of the major categorial phrases in terms of (23).

(Note that the feature system naturally leads to the inclusion of PP into the X-bar system.)

$$(23) \quad \begin{array}{ll} \text{NP} = \overline{\overline{\begin{bmatrix} +N \\ -V \end{bmatrix}}} & \text{AP} = \overline{\overline{\begin{bmatrix} +N \\ +V \end{bmatrix}}} \\ \text{VP} = \overline{\overline{\begin{bmatrix} -N \\ +V \end{bmatrix}}} & \text{PP} = \overline{\overline{\begin{bmatrix} -N \\ -V \end{bmatrix}}} \end{array}$$

This revision made it possible for syntactic rules to refer to natural classes of categories, just as feature notation allows in the case of phonological rules. Moreover, the choice of a particular feature system has an empirical effect: it defines certain natural classes of categories, and excludes others. Chomsky's feature system predicts that the syntactic natural classes are those of (21); it excludes as "unnatural" the following:¹³

- (24) a. ([+N, -V], [-N, +V]) (nouns, verbs)
 b. ([+N, +V], [-N, -V]) (adjectives, prepositions)

To the extent that the rules of syntax and morphology make use of the natural classes of categories in (21), and ignore the "unnatural" classes in (24), the hypothesized feature system derives empirical support.

3.2 In fact, there is considerable evidence to support this theory's classification of the lexical categories. In general, the evidence takes the form of specific rules of grammar which do not apply to all the categories, but rather to subsets of the categories in question.

Consider first the natural class defined by [+N], which includes nouns and adjectives. As noted by Chomsky (1974) and Jackendoff (1977), NP and AP are the only categorial phrases in which the rule of *of*-Insertion

applies:

- (25) a. The enemy destroyed the city
There arrived three men
- b. [the enemy's destruction of the city]
[the arrival of three men]
- (26) a. John fears heights
- b. [John's fear of heights]
- c. John is [fearful of heights]
- (27) a. John is careful to consider his neighbors
- b. [John's consideration of his neighbors]
- c. John is [considerate of his neighbors]

(We return to a more detailed discussion of this rule in Chapter 3.¹⁴)

The class of lexical categories defined by [-N] is the class of Case-assigners, as observed by Vergnaud, Chomsky, and others. Suppose, following Chomsky (1981), that all lexical NPs must be assigned Case when they function as arguments.¹⁵ This accounts for the fact that only [-N] categories take bare NP objects, while the objects of adjectives and nouns are preceded by a preposition:

- (28) a. The battallion is [_{VP} nearing the fortress] now
- b. The battallion is [_{PP} down [_{PP} near the fortress]] now
- c. The battallion is [_{AP} very near to the fortress] now
- d. [_{NP} the battallion's nearness to the fortress]
- (29) a. This chair is [_{PP} worth a lot of money]
- b. This article is [_{AP} worthy of your attention]
- c. *This article is [_{AP} worthy your consideration]

Although there are one or two apparent exceptions to this pattern, (28) and (29) illustrate the general rule.¹⁶

The feature value [+V] defines the set of phrasal categories which appear as prenominal modifiers in German, as noted by Van Riemsdijk (1980):

- (30) a. [der [seiner Freundin ueberdruessige [Student]
 the of his girlfriend weary student
 'the student weary of his girlfriend'
- b. [ein [sein Studium seit langem hassender] Student]
 a his studies since long hating student
 'a student hating his studies for a long time'
- c. [die [mit ewigem Schnee bedeckten] Berge]
 the with eternal snow covered mountains
 'the mountains eternally covered with snow'

Certain rules of English word-formation also refer to this feature value,
 as we shall see later on.¹⁷

Finally, the class of categories defined by [-V] correponds at
 the \bar{X} level to the set of phrases which may be focussed in cleft
 constructions, as observed by Jackendoff (1977) and others:

- (31) a. It was [_{NP} your book about the double helix] that I wanted
 b. It was [_{PP} under the chair] that I think I left my coat
 c. *It was [_{VP} go home early] that John did
 d. *It was [_{AP} very angry at me] that John was

Note that the ungrammaticality of (31c,d) cannot be attributed to any
 general semantic or pragmatic prohibition against focussing predicate
 phrases, since the near-synonymous pseudo-cleft construction are fine:

- (32) a. What I wanted was [_{NP} your book about the double helix]
 b. Where I think I left my coat was [_{PP} under the chair]
 c. What John did was [_{VP} go home early]
 d. What John was was [_{AP} very angry at me]

Clearly it is some syntactic property shared by the [-V] categories which
 allows them to be clefted in (31), and it is probable that the ultimate
 explanation for the contrast in (31) will come from the referential
 properties of the [-V] categories.¹⁸

We have seen that various syntactic rules apply to certain lexical

categories but not others. These facts are significant, because it is probable that the abstract principles that determine grammatical knowledge are not formulated in terms of disjunctive sets -- at least this has been a very important and fundamental assumption underlying the most explanatory and successful work in linguistic theory. From this it follows that the existence of rules which appear to pick out specific pairs of categories (and not others) constitutes evidence for a feature system which derives the relevant classes, just as the existence of phonological rules applying to a certain natural class of segments constitutes evidence for the phonological features which define the class of segments involved. To the extent that the rules of syntax pick out the pairs of categories defined as natural classes by the theory of syntactic features exemplified in (21), that theory derives empirical support.

3.3 Quite apart from the formal properties of specific syntactic rules, the feature system of (21) can be motivated on the basis of the fact that the pairs of categories which it defines as natural classes are often collapsed into single categories in languages other than English. For instance, in some languages there is no lexical or morphological distinction between adjectives and nouns, and so there is just one [+N] categorial phrase-type. In other languages, the categorial distinction between NP and PP is eliminated, and the function served by prepositions is taken over by nominal Case affixes. Moreover it is not unheard of for the categorial distinction between adjectives and verbs to be neutralized, so that a single syntactic category of predicates results. (The categorial distinction between adjectives and verbs is often unstable in languages which have rich systems of participial affixes.) All of these categorial

neutralizations are just what we should expect, given the natural classes of categories defined in (21).¹⁹ In each instance, the collapsing of two categories into one can be captured formally in terms of a lexical redundancy rule which sets a feature value for [+N] or [+V], given a particular value for the other feature. It may be that in some cases the value determined by the redundancy rule is unspecified, in effect creating the equivalent of a third feature value. For instance, in a language which collapses NP and PP into a single lexical category, it could be a redundant property of all lexical feature matrices specified as [-V] that they are left unspecified for [+N]. Alternatively, the lexical redundancy rule might state that all [-V] matrices are [+N] -- or perhaps [-N]. Significant consequences would follow from either choice, particularly for the rules of Case assignment, as we shall see in later chapters.²⁰

To my knowledge, it is never the case that such phenomena apply to the classes of categories in (24), which are excluded as "unnatural" by the feature system of (21). That is, there does not appear to be any language which had collapsed adjectives and prepositions into a single category, nor is there a language which combines nouns and verbs into a single lexical class, to the exclusion of other lexical entries.²¹ So it seems that the categorial system defined on the features [+N] and [+V] leads to a natural typology of languages, given the possibility of neutralized feature-values. Moreover, the specific range of typological variation follows as a necessary consequence of the formal theory, rather than as an accidental collection of unrelated observed tendencies.

There is another possible justification of the [+N] and [+V] features, of a more conceptual nature. Specifically, the natural classes of categories in (21) reveal regularities of meaning which suggest that

the two features which underlie them may actually represent a kind of grammatical encoding of general cognitive distinctions, recalling Fodor's (1979) notion of a translation relation holding between the language faculty and the "language" of thought -- "mentalese".

The [+N] categories usually denote some entity, either concrete or abstract. Nouns and noun phrases tend to be names for individuals or classes (types) of entities sharing some essential defining properties, while adjectives are used attributively of entities instantiating some property or quality, essential or accidental. On the other hand, the [+V] categories usually serve as function-names, in the terminology of Reichenbach (1947). Verbs normally have the meaning of a type of action or event, while adjectives refer to a given property or state. The relationship of attribution holding between an argument and a modifying AP is closely parallel to the predication relation holding between a subject and VP.

These correspondences between syntactic categories and meaning-classes are not absolute, of course. There are countless individual exceptions, such as the preposition *worth* and the PP idiom *out to lunch*, both of which have an adjectival sense. But the general correlation is significant, and probably plays a role in the theory of markedness. For instance, if the language faculty finds it easier, by virtue of markedness theory, to use a verb rather than a noun to describe a given type of action, then this could explain why action nominals are almost all derived from verbs, and not vice-versa.

It is intriguing to speculate on the development of the categorial system in terms of the evolution of the language faculty, given the close correlation with the logical notions discussed above. Various

functional motivations for categorial distinctions come to mind: for instance, the distinct morphological and syntactic properties of individual categories might serve a role in the acquisition of vocabulary by providing clues about the meanings of new words. Alternatively, the categorial feature system may simply represent a specific grammatical formalization of the related logical notions, made necessary by the obvious fact that grammar is used to express thought.

3.4 The categorial features introduced so far define four syntactic categories of lexical entries. Nevertheless, some elaboration is required in order to extend the theory to account for the complex distinctions among various clausal and participial phrases. Before proceeding, however, it is perhaps worth while comparing the feature system of (21) with the other major theory of syntactic features, namely that of Jackendoff (1977).

The major innovation proposed by Jackendoff -- and the only one which I will consider here -- is the elimination of the [+N] and [+V] features in favor of two new features, [+OBJ] and [+SUBJ]. (Henceforth, I will abbreviate these as [+O] and [+S], respectively.)

The feature [+O] makes the same categorial cut as the feature [+N], i.e. nouns and adjectives vs. verbs and prepositions. The [+O] categories are defined as those "whose complements may include a surface NP direct object", i.e. V and P. Clearly, there is no empirical difference between the two systems with respect to this feature, save for the fact that the ability to assign Case is cast in terms of a defining property of taking a bare NP object at Surface Structure. (Jackendoff assumes a rule of *of*-Insertion, so all major categories are alike in this respect at Deep Structure.

The genuine empirical distinction between the theories emerges with Jackendoff's feature [+S], which replaces [+V]. The [+S] categories are those whose phrasal projections contain a syntactic subject position, which Jackendoff claims the [-S] categories lack. Nouns and verbs are [+S], while adjectives and prepositions are [-S].

There is a clear distinction between the feature [+V] and Jackendoff's substitute [+S] in terms of the categorial classes that they define. The two classes of phrases defined by [+V] -- NP and AP vs. VP and PP -- are excluded as unnatural by Jackendoff's feature system, while the classes defined by [+S] are precisely those of (24), which are defined as unnatural in the system based on [+N] and [+V]. The two theories can be distinguished empirically in terms of the classes of categories that are referred to by specific rules of grammar. As we have seen, there is considerable evidence for the [+V] feature from various rules of syntax and morphology (cf. fn 20), and from observed categorial neutralizations in various languages. It is only fair, however, to see if there are some rules of grammar which pick out either of the classes defined by the [+S] feature, both of which are excluded as unnatural by the system in (21).

Significantly, it seems that this is not the case. First of all, with respect to the class defined by [-S] -- i.e. P and A, or PP and AP -- it seems that there is no rule of grammar which makes exclusive reference to this class. Although Jackendoff remarks that A and P are "often thought of as 'modifiers'," this is about the only respect in which the categories are similar; moreover, it is not at all obvious that this characterization excludes other modifiers such as relative clauses of various types.

It is the class of categorial phrases defined by [+S] that constitutes

Jackendoff's major motivation for his proposed innovation; he claims that "there are many rules which generalize across supercategories of N and V, and this is not expected in a feature system like [21]." (p. 31) Jackendoff's claim rests crucially on his assumption that S and \bar{S} are projections of the category V, since virtually all of his arguments are based on parallels between NP and S (with respect to internal structure) or NP and \bar{S} (with respect to external distribution). About the only case where the lexical heads N and V even appear to function as a natural class is with respect to the Gapping construction, where either N or V can be gapped, as Jackendoff notes (p. 43):

- (33) a. Max plays saxophone, and Medusa — sarussophone
 b. [Max's recording of Klemperer, and Medusa's — of Bernstein]

But adjectives can also be gapped, suggesting that the class [N,V] is not crucial in the formulation of the rule:²²

- (34) a. This made John angry at Susan, and Bill — at Mary
 b. I consider apples superior to pears, and carrots — to cucumbers

Apart from the case of Gapping, all arguments for [+S] depend upon parallelisms between NP and S or \bar{S} . Consider first the NP/S parallels. All of these crucially involve subject position, which Jackendoff assumes to be (i) limited in its distribution to S and NP, and (ii) exactly parallel (structurally) in each case. I will argue in detail against the first assumption in Chapter 4, where I will show that the base must allow for all major lexical categories to have subjects.²³ In this respect, there is nothing special about the subject position of NP, as distinct from AP, VP, or PP. As for the claim that there is an exact structural parallel between the subject positions in the NP and S with

respect to X-bar theory, it seems that in fact the opposite is true.

First of all, it appears that there is some universal principle of phrase structure which requires that S always contain a structural subject position, even when no thematic role is assigned to this position.²⁴ This principle is inoperative with respect to the subject position of NP, as the contrast between (35) and (36) shows:

- (35) a. It appears that John is lying
 b. *Appears that John is lying
 c. Someone attempted to jump the fence
 d. *Attempted to jump the fence
- (36) a. [Appearances] can be deceiving
 b. [Attempts to jump the fence] will be discouraged

A second difference between the subject positions of S and NP relates to the fact that PRO can appear in the former but not the latter:

- (37) a. [_SPRO_i reading those books] amused John
 b. [PRO to err] is human
 c. Josephine_i intends [PRO_i to come along for the ride]
- (38) a. *[_{NP}PRO_i reading of those books] amused John_i
 b. *[PRO killing of the geese] is forbidden
 c. *Josephine_i is planning [PRO_i destruction of the tree-forth]

The theory of binding proposed by Chomsky (1981) derives as a theorem the fact that PRO may never appear in a governed position. A position is governed if it is dominated by some X-bar projection of a lexical head; thus the subcategorized complements in VP are all governed by V. Now although PRO does not appear in VP, it does appear in the subject position of S, as in (37); this follows from the definition of government, given the binding theory -- provided that S is not a projection of V.

The fact that PRO does not appear as the subject of NP follows from the fact that NP is a projection of N, as observed by Aoun and Sportiche (forthcoming).²⁵

A third difference between the subject positions of S and NP is that the subject of an embedded S can in some cases be properly governed by a matrix verb, allowing trace to appear there; this is never possible with the subject of an embedded NP:

- (39) a. Who_i do you believe [_S[e]_i to have claimed that John is smart]?
 b. Which boy_i do you expect [_S[e]_i to win the race]?
 (40) a. *Who(se)_i do you believe [_{NP}[e]_i claim that John is smart]?
 b. *Who(se)_i did not expect [_{NP}[e] winning of the race]?

The ungrammaticality of the sentences in (40) can plausibly be attributed to the fact that the empty category (trace) in the subject position of NP is not properly governed, resulting in a violation of Chomsky's (1981) Empty Category Principle (ECP).²⁶ Now according to the standard definitions of government, no category can govern across the boundary defined by a maximal projection. Then the violations in (40) follow if NP is a maximal projection -- hardly a controversial assumption. But then the grammaticality of (39) can only be accounted for if it is assumed that S is not a maximal projection, again implying that the subject position in S is not precisely parallel in X-bar terms to the subject position in NP.

In several respects, then, there turn out to be various subtle pieces of evidence suggesting that the subject positions of S and NP are structurally distinct, even in the category-neutral terms of X-bar theory. In fact, there are only two respects in which the two positions are really alike: (i) they both count as a "subject" position for the

purposes of thematic role assignment of the "subject argument" in the terms of Williams (1980c), and (11) they are both subject to *Move α* , as in passive constructions and subject postposing constructions. However, I will argue in Chapter 4 that both of these properties are not limited to the subject position in S and NP, but rather are properties of a structural position which actually occurs in the phrasal projections of all lexical categories.

It therefore seems reasonable to conclude that S and NP are not entirely parallel with respect to the structural subject position, which is governed by the head noun in NP, but not by the verb in S. But if S is not a projection of V, then there is no further motivation for assuming that N and V (or NP and VP) form a natural class, as the theory of syntactic features in (21) correctly predicts.

4. Extending the Feature System

4.1 There is one important respect in which NP and \bar{S} show a strong parallelism in behavior, and this relates to strict subcategorization. Specifically, it is very, very, common for these two categories to appear as disjunctive terms in strict subcategorization frames:

- (41) a. Jim reported [his brother's disappearance] to the police
- b. The prisoner requested [an early release]
- c. Does Janice know [the rules of the game] ?
- (42) a. Jim reported to the police [that his brother had disappeared]
- b. The prisoner requested [to be released early]
- c. Does Janice know [how to play the game] ?

Clearly, the NP complements in (41) correspond directly to the \bar{S} complements in (42); both of them are direct objects, in some sense. The basis of this intuition is that the governing verbs assign precisely the same θ -role of

"object" or "theme" to the NPs in (41) as they assign to the \bar{S} complements in (42).

In order to recognize the significance of this fact for the theory of syntactic features, it is first necessary to understand the relationship between strict subcategorization and thematic role assignment. The notion of a thematic role, or θ -role, is related to the argument structure of a logical predicate; specifically, a function-name assigns a θ -role to each of its arguments. Suppose that every lexical entry for a verb contains an explicit representation of all of the θ -roles that it assigns to its complements. (Presumably this is also true for function-names such as adjectives and derived nominals.) Let us call this internal representation of the verb's argument structure its thematic grid, or θ -grid. Each position in the thematic grid of a verb will correspond, at the level of Logical Form, to an argument position in any phrase structure configuration where it appears. (This one-to-one correspondence between θ -roles and arguments is required by Chomsky's (1981) θ -criterion; see Chapter 3 for a fuller discussion.) Since each θ -role must be assigned to a corresponding argument, the θ -grid of a given verb can be thought of as a code for the set of argument positions which may appear as its complements. To view the θ -grid as a lexical code for a structural skeleton of argument positions is essentially equivalent to viewing the complement structure as a projection of the argument structure of the governing head.²⁷

For each of the positions in the θ -grid, the lexical entry for a verb may stipulate that any argument that is linked to this position in Logical Form must denote a specific type of argument, such as an individual, a proposition, a location or direction, an abstract property, or whatever.

Let us now consider the notion of a strict subcategorization frame. We have already discussed the formal status of strict subcategorization rules as they were defined in *Aspects*. It is obvious that the strict subcategorization features of lexical entries are closely analogous to the θ -grids introduced here. Whereas the θ -grid encodes the configurations of argument positions which a lexical entry requires at LF, the strict subcategorization frame encodes the syntactic configurations of complements that the lexical entry requires. Just as the θ -grid may stipulate that a given complement must denote a specific type of argument, so a strict subcategorization frame specifies a particular matrix of categorial distinctive features for each complement.

The correlation between strict subcategorization frames and θ -grids goes much deeper than this, however. It turns out that every complement position in the θ -grid corresponds directly to a complement position in the strict subcategorization frame, with the exception of the "subject" argument, which is never strictly subcategorized, as discovered by Chomsky (1965).²⁸ Apart from the subject argument, however, strict subcategorization frames overlap perfectly with θ -grids, and each subcategorized complement is assigned a θ -role by the governing head. This suggests that the two complementation frames are one and the same.

It can be shown that the one-to-one correspondence between subcategorized positions and θ -positions follows as a necessary consequence of the Projection Principle, proposed by Chomsky (1981). This principle is restated here in simplified form as (43):

(43) The Projection Principle

If α has the lexical property of requiring β as a complement, then α selects β at every grammatical level.

The grammatical levels referred to in (43) are the levels of Logical Form, D-structure, and S-structure. (D-structure roughly corresponds to Deep Structure, while S-structure is an enriched and slightly more abstract version of surface structure.) Suppose now that a verb, α , has a strict subcategorization frame which includes a complement, β , of a given category. Clearly strict subcategorization must be satisfied at some level of representation; for the sake of discussion, assume the relevant level to be D-structure. Thus α has the lexical property of requiring β at D-structure. It then follows from (43) that α must also select β at the level of Logical Form. Let us assume that a verb assigns a θ -role to each of its complements at LF. Then every subcategorized position will correspond to an argument position projected from the θ -grid, and the verb will assign a θ -role to each and every subcategorized complement.

The one-to-one correspondence between subcategorized complements and θ -roles suggests that the strict subcategorization frame for a lexical entry is directly dependent upon its θ -grid. More precisely, we can think of strict subcategorization features as being linked to specific positions in θ -grids. Take the θ -grid to be the basic code for the lexical head's complement structure. Every complement position corresponding to a position in the θ -grid is selected as a lexical property, so by virtue of (43) it must appear at every grammatical level. Then just as the argument status of each complement may be specified in the θ -grid, so may its categorial status be specified. This, in effect, is strict subcategorization.

This interpretation has the interesting effect of deriving a principled distinction between action nominals and other derived nominals

with respect to strict subcategorization. Intuitively, the meaning of an action nominal is "closer" to that of the verb on which it is based than, for instance, agent nominals are. The formal content of this intuition can be captured by assuming that action nominals have the same thematic structure (i.e. the same θ -grid) as the verbs from which they are derived. But if strict subcategorization features are simply annotations to θ -grids, it follows that derived nominals will also share the subcategorization features of the verbs that they correspond to. (Moreover, the selectional restrictions would also be shared, if these are also based on θ -grids, as seems likely.) This is precisely the result that Chomsky's (1970) revision of the lexicon was primarily intended to derive. Thus the "Remarks" version of a complex lexical entry with a single subcategorization frame may follow from the formal representation of the approximate synonymy holding between the verb-nominal pairs.

It is possible that certain properties which are specified in the θ -grid need not be satisfied at every grammatical level. For instance, it may be that the referential properties of a given complement -- whether it denotes an event, an entity, or whatever -- are only checked at the level of Logical Form. Certain NP complements may have D-structure representations identical to referring names, while having the representation of a proposition or question at the level of Logical Form which is "concealed" at D-structure; cf. Grimshaw (1977) for a discussion of examples like *he asked me the time*. On the other hand, it may be that syntactic categorial requirements are only relevant at either D-structure or S-structure, being irrelevant at LF; we will return to this issue in some detail in later chapters.

Given our conception of the relationship between strict subcate-

gorization and θ -role assignment, it is impossible for a verb to have a diverse collection of unrelated strict subcategorization frames, if each of these is linked to the same set of θ -roles. Each position in every subcategorization frame must be linked directly to a given position in a θ -grid. The thematic structure of the verb thus has the potential to impose strong constraints on the possibilities for strict subcategorization. Suppose that each position in a θ -grid may only be associated with a single matrix of categorial strict subcategorization features. This would mean that a complement position associated with a given θ -role could never have conflicting feature values selected as a lexical property by a verb. Thus it would never be possible to strictly subcategorize for a disjunctive set of categories with conflicting categorial feature values, such as NP and VP, or AP and PP. In other words, strict subcategorization would be limited to selection for natural classes of categories. This represents a very significant constraint on strict subcategorization -- but also a very natural one, with the potential of leading to an interesting theory of the acquisition of subcategorization frames.²⁹

Within the context of these proposals, let us now return to consider the status of the "disjunctive" subcategorizations for NP and \bar{S} , exemplified in (41 - 42). Recall that the subcategorized NP complements in (41) are assigned the same θ -roles as the corresponding \bar{S} complements in (42). In our terms, this means that the subcategorization requirements for NP and \bar{S} must be stated within a single matrix of categorial features associated with the "object" position in the θ -grids of these verbs. This in turn implies that NP and \bar{S} must form a natural class of syntactic categories, suggesting that \bar{S} , like NP, bears the categorial features [+N, -V].

Clearly, however, NP and \bar{S} are distinct categories, with very different grammatical properties. Most strikingly, they differ in terms

of internal structure in several respects. First of all, \bar{S} is always characterized by a subject-predicate configuration, even when no subject θ -role is assigned; cf. Emonds (1976) and Chomsky (1981). But this is never required in NP, as shown trivially by the existence of NPs such as *John*, *water*, *a nice book*, etc., and more significantly by the NPs in (36). A second difference is that \bar{S} contains a COMP position, which functions as a possible landing site for WH-Movement; this position is never available within NP:³⁰

- (44) a. I remembered [that Jim had visited France]
 b. I remembered [PRO to visit France]
 c. I remembered [Jim's visit to France]
- (45) a. I remembered [where Jim had visited]
 b. I remembered [where to visit]
 c. *I remembered [where (Jim's) visit (to)]

The COMP position in \bar{S} is also the site where the complementizers appear. As is well known, the choice of the complementizer is directly linked to the status of the clause with respect to tense and agreement. A tensed clause always requires a complementizer -- either *that* or *[e]*.³¹ An infinitival clause may select a complementizer *for* if it has a lexical subject. But NPs never contain a complementizer -- as might be expected, given the lack of tense or aspectual distinctions among NPs.

We can relate these observations in the following way. Suppose that the COMP position is where the tense operator appears, at some level of representation. Perhaps, following Den Besten (1978), the tense operator appears in COMP at D-structure; alternatively, it may only be required in COMP at the level of Logical Form, so as to c-command its clausal operand. Then the inclusion of the COMP position in \bar{S} will follow from

the fact that the clause contains a tense operator. Suppose further that all tense operators require a full proposition, i.e. a subject-predicate configuration as an operand. It will then follow that any phrase containing a tense operator will also have a complete subject-predicate structure as a structural complement to the operator position (COMP). Thus COMP serves as an operator position of a sort, regardless of whether WH-movement applies. Tense emerges as a propositional operator, similar to negation, as opposed to an operator such as WH, which must bind a variable.

In these terms, the tense operator can be construed as the crucial underlying difference between NP and \bar{S} . This can be formalized in terms of the feature system by assigning the feature [+Tense] to \bar{S} and [-Tense] to NP. The [+Tense] feature must be distinguished from the [+Past] feature that is morphologically realized in finite clauses, since the characteristic properties of \bar{S} -- an obligatory subject-predicate structure and a clause-internal COMP position -- are shared by *to*-Infinitives, as shown by Chomsky (1981) and Koster and May (1981). In short, by our criteria, *to*-Infinitives must be [+Tense].

This claim runs counter to the traditional assumption that all infinitives are [-Tense]. But a careful consideration of the meaning of these clauses shows that this assumption is incorrect. English *to*-Infinitives lack the morphological feature [+Past], but this does not mean that they have no abstract tense operator. Rather, their status as being neither present nor past has the effect of specifying that the time-frame of the clause is unrealized with respect to the tense of the matrix within which the infinitival appears. In other words the tense of a *to*-Infinitive is roughly that of *possible future*, recalling Bresnan's (1972, 86)

observation that an infinitival complement "may describe something hypothetical or unrealized", although the complement has an implied tense "when the predicate [containing it] is 'dated' or fixed in present or past time." This unrealized tense is illustrated in the contrast between (46) and (47):

- (46) a. Jenny remembered [_{S_i} PRO to lock the car]
 b. Jim tried [_{S_i} PRO to persuade Brian [_{S_j} PRO to come]]
- (47) a. Jenny remembered [_{S_i} PRO locking the car]
 b. Jim tried [_{S_i} PRO persuading Brian [_{S_j} PRO to come]]

In (46) the tense of _{S_i} is specified as being unrealized with respect to the tense of the matrix. Thus in (46a) for example, Jenny has not yet locked the car when she remembers to do so; similarly for both embedded clauses in (46b). This is not true for the embedded gerunds in (47), which have an unspecified tense; the interpretation of the tense setting of these clauses is heavily dependent upon the semantics of the governing verb. Thus in (47a), the implication is that Jenny's locking the car occurred in the past, if her memory is correct; but in (47b) the time of Jim's persuading Brian may be either present or unrealized with respect to the reference point of the matrix tense, as illustrated in (48):

- (48) a. Jim tried persuading Brian to come, but he didn't succeed.
 (unrealized)
- b. Jim tried persuading Brian to come, but even though he succeeded,
 it didn't do us any good, because Brian's mother wouldn't let
 him leave the house. (present)

The contrast between the unambiguous unrealized tense of the infinitival complements and the ambiguous tense of the gerunds can be attributed to the abstract tense operator of the *to*-Infinitive. By conceiving of the Tense feature in this way, abstracting away from the [₊Past] feature,

we return to an approximation of the traditional grammarians' notion of "mood"; in these terms, it is reasonable to consider *to*-Infinitives as [+Tense].³²

Despite the fact that tensed clauses and *to*-Infinitives share the [+Tense] feature, there appear to be significant differences which follow from whether the [+Tense] feature is accompanied by the morphological feature [+Past]. Specifically, the [+Tense, +Past] head of a finite clause assigns nominative Case to the subject position which it governs. The subject position of an infinitival clause is neither governed by the head of the clause nor assigned Case by it. (Recall that PRO may not appear in a governed position, and thus serves as a diagnostic for government: we return to this issue briefly in Chapter 3.) Only if the complementizer *for* appears is the subject position governed and assigned Case, by virtue of the [-N] feature of the complementizer:

- (49) a. This is the chair [on which PRO to sit --]
 b. *This is the chair [on which he to sit --]
- (50) a. This is the chair [on which he should sit --]
 b. *This is the chair [on which PRO should sit --]
- (51) a. This is the chair [for him to sit on --]
 b. *This is the chair [for PRO to sit on --]

In (49), the subject position is ungoverned; in (50) it is governed by [+Tense, -Past] head, which assigns nominative; in (51) it is governed by *for*, which assigns objective.

Why does the subject position remained ungoverned in (49), despite the presence of the [+Tense] feature? It seems that this feature must co-occur with [+Past] in order to govern. Perhaps this means that the head position of infinitival clause is actually an empty element, if we

interpret the Tense feature as a categorial feature; we might then interpret [+Past] as a feature which gives this position lexical content. Then only a head position which has lexical content would be eligible to govern.³³ (I have avoided being specific about what the head position of \bar{S} actually is; I will return to this briefly in Chapter 2, and in greater detail in Chapter 6.)

Gerunds have a curious status with respect to the categorial distinctions between NP and S/\bar{S} that we have considered so far. Like tensed and infinitival clauses, gerunds always have a propositional (subject-predicate) structure, and a determiner may not substitute for a phrase-internal subject, as is possible in NP:

- (52) a. *I disapproved of [the killing the geese]
 b. I disapproved of [John's killing the geese]
 c. I disapproved of [PRO killing the geese]

Moreover, like a bare infinitive, but unlike a noun phrase, a gerund has an ungoverned subject position, as observed above (cf. 52c, 37a vs. 38a).

On the other hand, gerunds, like NPs, do not have a COMP position:

- (53) a. *This is the chair [on which (his) sitting --] (cf. 49)
 b. I remembered [(his) visiting France]
 c. *I remembered [where (his) visiting] (cf. 45)

Finally, it has often been observed that gerunds share the external distributional properties of NP, a fact which I will discuss in some detail in Chapter 3.

It seems, then, that the gerund is a cross between NP and S/\bar{S} , sharing properties of both. This implies that it is a neutralized category, as suggested by Van Riemsdijk (1980). More specifically, if NP and S/\bar{S} are distinguished by virtue of the feature [+Tense], then gerunds must be

unspecified for this feature. Whereas NP is [+N, -V, -Tense], and \bar{S} is [+N, -V, +Tense], the gerund must be simply [+N, -V]; it is analogous to the neutralized categories alluded to in our discussion of cross-linguistic variation above. This hypothesis may provide an explanation for the phenomenon observed in (47 - 48) where the tense of the gerund is unspecified clause-internally, and can only be interpreted on the basis of semantic properties of the governing verb.

Let us assume, then, that the [+Tense] feature is simply unspecified for gerunds. We can now derive their lack of a COMP position, if we assume that the possibility of having a base-generated COMP is directly dependent upon the existence of a clause-internal tense operator. This would also explain the ungoverned status of the subject position of gerunds, since they -- like to-infinitives -- lack the [+Past] feature.³⁴ Moreover, if the limited distribution of true \bar{S} clauses can be attributed to the effects of the [+Tense] feature in some way, then it would follow that gerunds would behave like NP rather than \bar{S} in this respect. (I return to this in Chapter 3.)

Given the theory of strict subcategorization for natural classes outlined above, the analysis of gerunds as a neutralized category has a clear empirical consequence: it should be impossible for a verb to subcategorize for a complement which is either \bar{S} or NP, but not a gerund. Recall that a given argument position in a θ -grid may be associated with any of the categorial matrices in (54a-c), but never with a disjunction of matrices, as in (54d):

- (54) a. [+N, -V, +Tense]
 b. [+N, -V, -Tense]
 c. [+N, -V]
 d. [+N, -V, $\left\{ \begin{array}{l} +\text{Tense} \\ -\text{Tense} \end{array} \right\}$]

The matrix in (54a) represents subcategorization for \bar{S} ; that in (54b) represents subcategorization for NP; the matrix in (54c) is the unmarked case of subcategorization for the natural class comprising both NP and \bar{S} . But gerunds are a neutralized category, exhaustively characterized by the matrix in (54c), so subcategorization for the natural class of NP and \bar{S} will necessarily include gerunds. This prediction seems to be quite generally correct.

Thus the introduction of the [±Tense] feature into the categorial system provides a natural means of distinguishing the categories NP and \bar{S} , while still characterizing them as a natural class. Moreover, the tense operator provides a plausible basis for an explanation of the various structural differences between NP and the S-system, while also allowing for an account of the neutralized category of gerunds. Although many problems remain to be worked out in detail, this seems to be a promising general line of research.

4.2 In addition to the various clausal complements characterized by the [±Tense] feature, English also has two types of participial phrases, exemplified in (55) and (56):

- (55) a. Jim was [playing the guitar]
 b. I heard Jim [playing the guitar]
- (56) a. The city was [believed to have been destroyed]
 b. I want the fugitives [captured by sundown]
 c. The warden had the fugitives [captured by six o'clock]

Let us first consider the status of the active participle in (55).

Virtually all of the data concerning this participle are greatly confused by the fact that it is phonologically identical to the verb in a gerund clause. In some cases, however, it is possible to distinguish them. The

participle in (55) is usually described as a "progressive" participle, and it cannot be used with durative verbs such as "own" or "resemble" without forcing an unnatural distortion of their normal meanings:

- (57) a. ? Harvard University is owning a lot of land
 b. ? I saw Jim resembling his brother very closely

This is not true for the homophonous gerunds:

- (58) a. I disapproved of [Harvard's owing so much land]
 b. I was unaware of [Jim's resembling his brother so closely]

It is plausible to suppose that progressive participles, like simple verbs, bear the feature [-N], since they assign objective case, as shown by (55). Moreover, a large class of perception verbs subcategorize for a natural class of bare VP complements, where the verbal head may be either a regular verb or a progressive participle:

- (59) a. I heard Jim play/playing the guitar
 b. I watched the soldiers play/playing cards
 c. I felt the snow melt/melting on my hands

So it is likely that these participles are [-N, +V], like other verbs. Still, some feature must distinguish them from nonprogressive verbs, since they are not mutually interchangeable:

- (60) a. John should leave/*leaving
 b. Jim was playing/*play the guitar

Perhaps the two types of verbs should be distinguished in terms of an aspectual feature relating to perfectivity, which we could call [+P]. Progressive verbs would be [-P], and regular verbs describing a single complete action would be [+P].

There are certain problems with this approach, however; specifically,

it fails to explain why the progressive participle should have such a limited distribution. Virtually all instances of morphological *V+ing* have the properties of gerunds -- apart from those following perception verbs and progressive *be*. It is conceivable that all instances of *V+ing* are really gerund clauses after all, in which case the progressive sense of the "participle" would have to be attributed to the semantic properties of the governing verb. This might explain why gerund *V+ing* and progressive *V+ing* are both subject to Ross's celebrated *Doubl-Ing* filter (cf. Ross 1972). On the other hand, this approach has the drawback of not being able to treat the subcategorization frames of the perception verbs in (59) as a natural class; nor does it provide a straightforward account of the morphological derivation of *V+ing* adjectives. I will not attempt to resolve this issue here; the alternatives seem to be fairly clear, within the general framework of the theory of categorial features.

Consider now the passive participles in (56). These share a number of properties of both verbs and adjectives. For instance, passive participles can appear as prenominal modifiers, a fact which has often been taken to justify a morphological rule converting passive participles into adjectives.³⁶ Similarly, passive participles -- like adjectives -- are unable to assign objective Case, suggesting that they lack the [-N] feature of verbs. On the other hand, Chomsky (1981) observes that the rule of *of*-Insertion does not apply within a participial phrase, suggesting that the passive participles heading such phrases lack the [+N] feature. This is illustrated in (61):

- (61) a. Everyone is [fearful of [these snakes]]
 b. [These snakes]_i were [feared [e]_i (by everyone)]
 c. *Everyone was [feared (of) [these snakes]]
 d. *There was [feared (of) [these snakes]]
 e. *It was [feared (of) [these snakes]]

Moreover, passive participles do not necessarily satisfy subcategorization requirements for an AP complement:

- (62) a. John seems stupid/tired/unhappy
 b. *John seems shot by the soldiers
 cf. c. John seems to have been shot by the soldiers

A reasonable conclusion to draw is that passive participles are another instance of a neutralized category, being unspecified for the feature [+N], which normally distinguishes adjectives from verbs. Since passive participles lack the [+N] feature, they do not trigger *of*-Insertion; but they also lack the [-N] feature, so they are unable to assign objective Case.

There is an interesting correlation between English passive participles and German adjectives with respect to Case assignment. Van Riemsdijk (1980) suggests that German adjectives are unspecified with respect to [+N]. He proposes that this property explains why these adjectives may assign oblique Case to an NP complement; the idea is that while objective Case may only be assigned by [-N] categories, oblique Case may be assigned by categories which are nondistinct from [-N]. If this idea is correct, then it provides an explanation for the ability of English dative passives to take an object NP, under the assumption that the NP is assigned oblique Case:

- (63) a. Paul was given a coffee grinder by his parents
 b. Neil's parents were sent a wedding announcement

This is not true for English adjectives, as observed above; cf. (28 - 29) and fn. 16.

Once again, the neutralization hypothesis has a direct empirical consequence with respect to strict subcategorization: it should be impossible for a verb to strictly subcategorize for a complement that

is headed by either A or V but not by a passive participle. In order to allow the features for AP or VP to satisfy strict subcategorization requirements for a given argument position, the verb must simply associate the [+V] feature with the relevant position in the θ -grid, leaving it unspecified for [N]. Therefore it should be impossible for a verb to strictly subcategorize for a complement that is either AP or VP, but not a passive participial phrase. This seems to be correct, as illustrated by the complementation paradigms for *see*, *watch*, and *consider*, whose respective subcategorization frames involve the matrices [+V], [+V, -N], and [+V, +N]:

- (64) a. I saw him drunk
 b. I saw him walking home
 c. I saw him shot by the soldiers
- (65) a. *I watched him drunk
 b. I watched him walking home
 c. *I watched him shot by the soldiers
- (66) a. I consider him stupid
 b. *I consider him judged unfairly
 c. *I consider him being judged unfairly
 cf. d. I consider him to have been judged unfairly

So it seems that the neutralized status of the passive participle with respect to the categorial feature [N] constitutes the basis for a viable explanation of the particular cluster of properties that it displays.

4.3 This concludes our discussion of categorial features within the framework of the theory of phrase structure which grew out of *Aspects* and "Remarks". To summarize, we have seen that the two features proposed by Chomsky -- [N] and [V] -- appear to define the correct natural

classes of the major lexical categories N, A, V, and P. Nevertheless, a categorial system defined on just two features is intrinsically incapable of making the finer distinctions necessary to distinguish various classes of clausal and participial phrases. The [+Tense] feature, which seems to be linked closely with the INFL (AUX) position within S, and also to the COMP position in \bar{S} , provides a natural basis for a categorial distinction between NP and the S/ \bar{S} system, from which their various distinctive properties can be derived. It is plausible to assume that the [+Tense] feature, like the other categorial features, is projected from the head position of the phrase. This raises interesting questions about the status of S and \bar{S} with respect to the X-bar system. I will touch on this very briefly in Chapter 2, returning to it in greater detail in Chapter 6.

We have also seen that the possibility of leaving certain categorial feature values unspecified for a class of lexical entries results in the neutralization of the distinctions defined by these features. This provides the basis for a well-defined set of parameters within which individual languages may vary slightly in how they instantiate the universal set of categorial features in terms of distinct lexical classes, leading to a natural typology of known categorial systems in various languages. Moreover, this kind of approach can be extended to account for the distinctive cluster of properties displayed by English gerund clauses and passive participles, along the lines suggested by Van Riemsdijk (1980) in his analysis of German adjectives.

In the following chapters, I will build on the theoretical foundations sketched out in the preceding discussion. Chapter 2 provides a critical evaluation of the system of phrase structure rules within the categorial component. It is argued that the theory of phrase structure

implicit in this rule system is largely redundant, offers no real depth of explanation, and provides little more than an arbitrary collection of observed generalizations about each phrasal category. Based on the general methodological assumption that a theory with these characteristics is no real theory at all, it is suggested that the categorial component does not exist. Subsequent chapters are devoted toward working out in some detail how the theory of grammar can be enriched so that the constellation of phenomena traditionally associated with language-specific phrase structure rules can be deduced from the interaction of general principles of the language faculty with specific options left open for parametric variation at certain points in the structure of the grammar.

FOOTNOTES: CHAPTER 1

1. These rules appear in *Aspects* (p. 107) in this form. At the point where the rules are presented, S' is conceived of as a dummy element holding the place of a sentence which is inserted by a Generalized Transformation. In a later section, Generalized Transformations are eliminated, and S' is replaced by S, which can be expanded by recursive application of (2i).

2. Although strict subcategorization features have been retained in one form or another in most subsequent work, the actual mechanism of the strict subcategorization rules deriving complex symbols has been largely ignored. Later in this chapter, I shall link the strict subcategorization features directly to the verb's thematic structure; see also Chapter 3, Section 6 for some related discussion.

3. This discussion ignores the selectional rules, which differ in certain respects from the rules of strict subcategorization. The subcategorization rules have a strictly local domain (in the case of V, within VP), and refer only to categorial features. The selectional rules apply to all arguments -- including the subject, which appears outside of VP; moreover, these rules refer to semantic properties. Chomsky's observation that strict subcategorization rules are limited in their domain of application to the terms introduced by the categorial rule which immediately dominates the lexical category itself actually anticipates the recent notion of government (stated in terms of an X-bar domain).

4. It is reasonable to suppose that the only kind of evidence that is eligible for inclusion in Type (i) is positive evidence that appears in relatively simple sentences. Evidence of Type (ii) is exemplified by the

negative (and positive) evidence associated with syntactic islands, filters, and so on. The interest which the Type (ii) evidence has elicited in most recent research derives from the fact that it reflects knowledge which cannot plausibly be attributed to the environment in any direct way. Rather, evidence of Type (ii) suggests the need for a linguistic theory with rich deductive structure, wherein the environment provides the language learner with evidence of Type (i), which is then used by the language acquisition device (UG) to derive a grammar of the steady state from which the complex knowledge of Type (ii) follows.

5. The formulation of (13) ignores the issue of whether "reduced" modifiers are all derived transformationally from full sentential relative clauses with an internal copular structure, as was commonly assumed in Standard Theory accounts. See Williams (1975) for cogent arguments against this assumption, as well as Chapter 4 below for related discussion.

6. Interestingly, there is some evidence that two distinct projection rules really are involved here, after all. See Chapter 4 for discussion.

7. The motivation for the transformational rule was not based solely upon the structural parallels of the sort evident in (14) and (15); another major motivation was the morphological relatedness (ultimately, phonological relatedness) holding between the noun/verb pairs. There was no morphological component of the grammar in the Standard Theory, so all affixes had to be adjoined to stems transformationally. Perhaps the paradigmatic analysis of transformational affixation was Chomsky's (1957) account of the English verbal complex.

8. To be more precise: the nominals in (19) have no plausible non-

nominal Deep Structure source within the framework of a theory that does not encompass "positive absolute exceptions" of the sort proposed by Lakoff (1971). Only rule features of this sort, which make nominalization obligatory for every noun that has no corresponding verb, could incorporate the parallelism of structure in (19) into a transformational theory of nominalization.

9. In later work (e.g. Chomsky 1974 and Jackendoff 1977) prepositions and PPs were incorporated into the X-bar system. See Section 3.1 for further discussion.

10. Jackendoff (1975) proposes an alternative account of derived nominals, according to which the nominal-verb pairs do not constitute a single lexical entry. Instead, each category has a separate entry, but entries can be related to each other by lexical redundancy rules. A possible argument in favor of the "Remarks" theory of the lexicon is the fact that the existence of one nominal form in a complex lexical entry often excludes the possibility of another. This is the phenomenon of "blocking" discussed in Aronoff (1976). If there is just one slot in a lexical entry for a word of a given category, the phenomenon of blocking is explained. Another argument for the "Remarks" theory is the fact that derived "action" nominals almost always share the abstract category-neutral properties of the verbs upon which they are based: in particular, the strict subcategorization features and the [+R] feature discussed in Chapter 3, Section 7.2. On the other hand, certain derived nominals -- in particular, agentive nominals which do not share strict subcategorization features with their related verbs -- may be amenable to a theory along the lines proposed by Jackendoff. In subsequent discussion, I will continue to assume that the "Remarks" theory is essentially correct, at least for true action nominals.

11. Selectional restrictions were eventually abandoned to a large extent in the framework of the Extended Standard Theory. Perhaps such restrictions play a limited role in specifying properties of the arguments that may be associated with specific thematic roles assigned by a given verb; but their status is suspect, given recent assumptions that the scope of grammatical theory should be narrowed so as to exclude general cognitive knowledge about the world from the formal grammar.

12. Although Chomsky suggested this possibility in "Remarks", he was apparently reluctant to pursue it at that point, concluding that the proposal was "hardly clear enough even to be a speculation". (p. 199)

13. Van Riemsdijk (1978b) voices some healthy skepticism about the natural classes defined by the categorial system. In particular, he points out that the system implicitly assumes that no rule of grammar should be able to refer to a class of three of the major categories to the exclusion of a fourth. He then argues that there is a rule in the grammar of Dutch which incorporates adjectives, nouns, and prepositions into the verbal complex, although it does not apply to verbs themselves.

One must be careful in evaluating this objection. It is unclear from Van Riemsdijk's discussion that the phenomenon in question really involves a single incorporation rule that has substantially the same properties for each of the categories affected. If this turns out not to be the case, then the Dutch facts would be nonproblematic, since more than one rule might be involved. At a more fundamental level, it is not even clear that rules which affect three categories -- to the exclusion of a fourth -- necessarily count as counterevidence to the categorial feature theory even if it turns out that a single rule is involved. The exclusion of the fourth category

could be due to some general principle of grammar which makes the category in question incompatible with some property of the rule. True counterevidence to the feature theory must consist of a rule which applies to one of two-member "unnatural" classes in (24), so that even the categories excluded from the domain of the rule cannot be captured in terms of a natural class.

14. I have excluded from consideration those cases where *of*-Insertion appears to apply in VP, as in (i-ii):

- (i) I convinced John of my good intentions
- (ii) I told Bill of his father's crimes

Quite apart from the fact that it is not clear that these occurrences of *of* really represent insertion of a dummy preposition -- as opposed to selection of a true preposition by the governing verb -- it is clear that the appearance of *of* in this context is lexically determined, since the rule cannot apply blindly in VP.

Actually, it must be admitted that *of*-Insertion applies much more freely in NP than it does in AP, and it is conceivable that it is lexically triggered in AP too. On the other hand, the cases where the rule fails to apply in AP usually involve some other lexically -selected preposition which takes the place of *of*, so the failure of the rule's application in these contexts may be due to suppletion, analogous to cases discussed by Kiparsky (forthcoming).

15. In Chapter 3, this principle is extended to cover all arguments, including clausal complements. Note that PRO is excluded from the domain of this constraint.

16. These exceptions are discussed in Chapter 5, Section 6.3. See

also Maling (1980).

17. For instance, the rule of *un*-prefixation applies to the [+V] categories to the exclusion of the other two.

18. We might attribute this asymmetry to the fact that PPs and NPs have referring properties that verbs and adjectives lack. We could then assume that only referring phrases may head a relative clause that is introduced by the restrictive complementizers *that* or *[e]*. Of course these remarks are purely suggestive and do not constitute a real explanation for the phenomenon under discussion.

19. It has come to my attention that Y. Aoun has pursued a similar line of inquiry into categorial neutralizations in unpublished work.

20. In Chapter 3, I will propose that Case may never be assigned to [-N] categories. This would mean that if NP and PP were neutralized in the direction of PP it would be impossible for a verb to assign Case to the neutralized category. Bill Poser has suggested (personal communication) that Japanese may be an example of this type.

21. Obviously, if some hypothetical language were to collapse all of the categories into a single neutralized supercategory, then the theory of categorial features would not be falsified. I know of no language that fits this description, however.

22. See also Stowell (to appear), Manzini (1980), and Chomsky (1981).

24. Chomsky (1981) proposes that the universal formula for the structure of S is [NP - INFL - VP]. I will suggest further below that the

requirement for an obligatory subject in S may follow from a requirement of the Tense operator that it be accompanied by a complete propositional operand at LF. For an alternative view of the status of the subject position of S in UG, see Borer (1979).

25. The definition of government assumed here is adapted from Aoun and Sportiche (forthcoming). A formalized definition of government is provided in Chapter 3, Section 1. See also Chapter 6 below and Chomsky (1981).

26. I will assume here that proper government is a special case of government, as defined in Chapter 3. Specifically, proper government holds when the governing element shares a referential index with the category that it governs. The basic property of proper government is that it derives a principled asymmetry between the subject position and the subcategorized object position. The exact formulation of proper government is worked out in some detail in Chapter 6 below; see also Chomsky (1981), Kayne (1981), and Belletti and Rizzi (1980) for alternative proposals.

27. This is a variant of an idea of Chomsky's (1980) with respect to the status of D-structure.

28. It seems that the subject θ -role also has a special status, insofar as it is derived compositionally by the entire predicate, rather than from the verb itself. For some discussion, see Aoun and Sportiche (forthcoming).

29. The apparently arbitrary information associated with strict subcategorization frames represents a vast repository of information that must be acquired somehow during the acquisition process. If the child is guided in this domain by the assumption that subcategorization is limited to natural classes, then a significant simplification of the task of

vocabulary acquisition results.

30. Actually there is one construction which appears to instantiate some sort of analogue to the COMP position within NP:

(1) [How big a house] do you want to live in?

We might interpret the prenominal WH-phrase as a QP in the specifier position; this would imply that the article is adjoined to the noun, if the specifier position is occupied by QP. See Chapter 4 for related discussion.

31. There is evidence that a complementizer is present structurally in all tensed clauses. The relevant evidence concerns effects of the Empty Category Principle proposed by Chomsky (1981); see Chapter 6 for discussion.

32. The tense feature in the English infinitive seems to be analogous at some level to the Optative mood in Sanskrit, which occurs in substantially the same range of complement structures, and with a similar meaning.

33. This may be related to Kayne's (1980) observation that extraction from subject position is only possible when there is a Case-marked trace in COMP. Reformulating this in terms of government, we might assume that the Case features assigned to the trace in COMP give it lexical content, enabling it to govern the clausal subject position. See Chapter 6 for further discussion of this point.

34. For a discussion of the related "ACC-ing" construction, see Reuland (1980), who proposes that the head of a gerund may in some cases govern the subject position.

35. Actually, this is also true of the progressive participles when they do not assign Case, suggesting that they too may have a neutralized (quasi-

adjectival) status in some contexts. Note, incidentally, that the rule of un-prefixation mentioned in fn. 17 applies freely to both classes of participles.

CHAPTER TWO: A REVISED THEORY OF PHRASE STRUCTURE

In the previous chapter we reviewed the historical development of the base component, and considered in some detail a number of possible revisions of the theory of categorial features. Our primary concern was in arriving at a feature system that made the correct distinctions so as to achieve some degree of descriptive adequacy in terms of the empirical coverage of the grammar. We will now shift our perspective somewhat, and evaluate the formal properties of the categorial rule system with respect to the criterion of explanatory adequacy.

We shall see that the descriptive power of individual categorial rules is so strong that the theory as a whole is unable to provide genuine explanations of the phenomena that it has traditionally been supposed to account for. Moreover, in some domains, the categorial formulae turn out to be largely redundant within the overall structure of the grammar. Finally, for some languages, it seems that there are serious problems in explaining how the categorial rules are induced from the primary linguistic data — even given the constraints on X-bar theory.

In response to these objections, I will propose that the categorial component does not in fact exist, apart from the general category-neutral principles of X-bar theory. Certain revisions and extensions of the X-bar system will also be considered, within the framework of the theory of the base advocated here.

1. On Predetermined Structure

1.1 The standard theory of transformational grammar provided an explicit account of the idealized speaker-hearer's tacit knowledge of the

syntactic structure of his or her native language, represented in terms of the formal rule systems outlined in the previous chapter. But the theory had very little to say at a specific level about how these rules are actually learned during the period of acquisition.

As Chomsky (1965) cogently observed, children somehow manage to develop a richly structured grammatical knowledge -- in a surprisingly short time, and on the basis of a severely impoverished stimulus. No normal child is ever presented with an orderly sample of all the relevant grammatical evidence that would be required to rule out all the logically possible but incorrect grammars that are consistent with most of the sentences occurring in the speech environment. The evidence which informs the child of the specific properties of the language being learned is never neatly arranged in lists of appropriately labelled grammatical and ungrammatical sentences. Rather, the primary linguistic data are arranged in accidental and haphazard ways, differing in countless idiosyncratic respects with the experience of each speaker. But adult members of a given speech community display an impressive regularity of acquired knowledge, and this can't plausibly be attributed to a general theory of "learning", given the fundamental fact of the poverty and variability of the stimulus.

These facts suggest that the human mind must have a largely predetermined program for the form of the grammar that is ultimately developed. If such a "genetic program" exists, then it ought to be possible to discern its effects, in the form of specific formal properties of rules of various human grammars which should be essentially invariant from one language to the next. The discovery of the nature of this program constitutes the first step towards developing an explanatory

theory of acquisition, by identifying the aspects of grammatical knowledge that arise from the nature of the language faculty itself and therefore need not be derived from experience, thus isolating the information that the child is presumed to absorb on the basis of exposure to the stimulus.

Unfortunately, however, the theory of acquisition has had to wait several years before such goals came close to being within reach. The historical reasons for this are fairly clear. At an observational level, it had become evident by the late Sixties that the formal rules required to account for the syntactic competence of any normal speaker of English were on a level of complexity that had been undreamed of in previous theories of linguistic ability. In developing precise formal grammars of English and other languages, generative syntacticians worked toward the development of accurate and complete accounts of grammatical knowledge, and undoubtedly came far closer to descriptive adequacy than structuralist analyses ever had. Moreover, in comparing accounts of certain constructions in English with analogous constructions in other languages, syntacticians uncovered suggestive cross-linguistic parallels in association of form and function. But careful and precise formulations of the rules that were required to account for the full range of known facts associated with individual constructions invariably led to the discovery of seemingly arbitrary stipulations and conditions, which often appeared to be limited to specific constructions within one language — usually English.

The very complexity and variety of the transformational grammars of individual languages frustrated attempts to develop explanatory theories of language acquisition. Although there were some promising possibilities of formal linguistic universals, most of the complexities

in specific grammatical rules appeared to be tremendously idiosyncratic. This was perhaps most obvious for the transformational rules, each of which appeared to require an arbitrary collection of elementary operations (deletions, permutations, adjunctions, and substitutions) and various mysterious conditions preventing individual rules from applying in certain environments. It was obvious, from the perspective of a reasonable theory of acquisition, that these complexities could not be directly learned on the basis of experience, since the learning task would have to depend on explicit negative evidence of a very obscure kind.¹ (See Baker, 1979, for an insightful discussion of this problem.) On the other hand, very few of the observed conditions could be deduced from known properties of the language faculty, leading Chomsky (1965, p. 46) to remark that "no present-day theory of language can hope to attain explanatory adequacy beyond very restrictive domains." With respect to the transformational component of the grammar, it was not until work within the Extended Standard Theory had led to a drastic reduction in the expressive power of individual rules that the goal of explanatory adequacy was close to being realized.²

The status of categorial rules in the *Aspects* theory was slightly less problematic. Primarily because of the theory's implicit evaluation metric — which almost always seemed to favor a transformational account of a given phenomenon — the phrase structure rules of specific grammars remained fairly simple. This tendency toward simplicity in the categorial component was not due to an explicit theory of constraints on possible phrase structure rules, however. In this domain, the Standard Theory offered very little, apart from the general conditions on context-free rewrite rules — that there be at most one (nonterminal) symbol

on the left side of the arrow, and at least one term (terminal or non-terminal) in the expansion of the rule. Although there were some proposals formulated for a universal set of base rules, these did not find their way into mainstream assumptions.

Consequently the burden of accounting for the acquisition of categorial rules fell almost entirely upon induction from the primary linguistic data. Given the existence of the transformational component, the Deep Structure representations which would have to form the basis for such inductive procedures were themselves concealed from direct observation, thus requiring a very sophisticated evaluation metric to mediate between the primary data and the postulated rule systems, as observed in the previous chapter.

1.2. This situation changed significantly after the introduction of X-bar theory by Chomsky (1970). Although the revisions in the theory of the categorial component proposed in "Remarks" were primarily motivated to account for parallels between verbs and derived nominals in non-transformational terms, the introduction of X-bar theory was also the first significant contribution toward a substantive theory of predetermined properties of categorial rules.

Recall the basic format of the X-bar schema proposed by Chomsky (1970):

- (1) a. $\bar{\bar{X}} \longrightarrow [\text{SPEC } \bar{X}] - X$
- b. $\bar{X} \longrightarrow X - \dots$

As we have already seen, the use of the categorial variable X made it possible for lexical entries and transformational rules to refer to structural positions such as "subject" and "object", which held constant

across distinct categorial phrases.

Beyond this, however, the rule format in (1) can also be taken as a kind of predetermined set of skeletal phrase structure rules for each hierarchical level, provided by the language faculty as a basis for every rule of the categorial component in a given language. This would imply that much of a speaker's tacit knowledge of phrase structure is not directly induced from the stimulus after all; instead, the acquisition of individual idiosyncrasies of phrases could be viewed as a number of elaborations of (1a) or (1b) at specific points that are left open. A slightly different interpretation of (1) is to view it as one particular graphic instantiation, in the format of rewrite rules, of several more abstract underlying principles. In other words, the status of X-bar theory is not necessarily dependent upon the notation of the categorial component, and could just as plausibly be conceived of as a set of well formedness conditions on phrase structure configurations, rather than on the rules which allegedly derive them.

Since Chomsky's introduction of X-bar theory in "Remarks", there have appeared in the literature numerous proposals for revisions of the specific formulation in (1).³ Instead of considering all of these in detail, we can concentrate our attention on the basic principles of the theory, which are either explicitly or implicitly captured by most of the specific versions of X-bar schemata.

The first of these principles concerns the fact that each expansion contains a head term; \bar{X} must appear within the expansion of $\bar{\bar{X}}$, and X must appear in the expansion of \bar{X} . If all categorial rules conform to this pattern, then every phrase is endocentric; i.e., every phrase has a head. Jackendoff (1977) and Koster (1978a) have observed that this rules out a

priori a number of otherwise possible phrase structure rules, many of which might be superficially very plausible on the basis of external distribution. A prime example is the categorial rule (2), which was frequently invoked, e.g. by Rosenbaum (1967), in order to account for parallels in the external distribution of S and NP:

(2) NP \rightarrow S

Significantly, however, it has been convincingly shown — largely on the basis of negative evidence of which the child is presumably unaware — that embedded clauses are not NPs. (I will consider this in some detail in the next chapter.) To the extent that the language faculty resists generalizing from the shared distributional properties to the formulation in (2), the endocentric requirement derives empirical support.

Note that if this requirement applies to the internal structure of S, then an interesting consequence results. Suppose that the major constituents of S are (i) the subject NP, (ii) the INFL constituent (this corresponds, roughly, to AUX in the Standard Theory), and (iii) the VP. It then follows that either INFL or V is the head of S — assuming that the subject is a specifier of some sort, as suggested by the parallelism with the genitive subject of NP. Now if INFL is the head of S, and if S adheres to the general format in (1), then VP is the complement of INFL and the \bar{X} -level projection of INFL corresponds to the traditional predicate phrase:

(3) $[\bar{1} \text{ NP } [\bar{1} \text{ INFL - VP }]] \quad (\bar{1} - \text{Pred Phrase; } \bar{1} = S)$

On the other hand, if V were the head of S, as assumed by Jackendoff (1977), then INFL would be a specifier of \bar{V} , and the subject NP would be a specifier of \bar{V} or $\bar{\bar{V}}$, depending on the number of bar-levels assumed by

the theory. Since there is evidence that the subject position is not dominated by any projection of V, as noted in Chapter 1, I will assume (3) to be the correct structure, although this still leaves open the status of COMP, a matter to which we will return in Chapter 6.

A second claim implicit in (1) is that specifiers are generated at the \bar{X} level, while subcategorized complements appear at the \bar{X} level. Something like this appears to hold true in English, at least at the level of D-structure, despite the fact that the primary data are contaminated by stylistic rearrangements, parentheticals, and the like. This suggests that the hierarchical distinction between complement positions and specifier positions is something that the language faculty is tacitly prepared to encounter.

Nevertheless, it seems that there is considerable cross-linguistic variation on this point. Hale (1980) and Farmer (1980) argue that Japanese has just a single level of X-bar structure, within which both complements and specifiers may fall. Similarly, Van Riemsdijk (1980) points out that specifiers in German must be assumed to fall within the \bar{X} level in some cases, since they must appear between the head and its complements in some structures. (We return to this in Chapter 4.)

A third claim implicit in (1) is that the head term of the phrase appears at the periphery of \bar{X} . Although it is important to view the schema in (1) as being unordered in universal grammar -- as implied by the fact that individual languages differ in the left-right orientation of major constituents in fairly regular ways -- it does seem that subcategorized complements always appear on just one side of the head, rather than being split over both sides, with the head situated in the middle of \bar{X} .

From the perspective of acquisition, this restriction is important in that it provides a straightforward means for (i) differentiating subcategorized complements in \bar{X} from non-subcategorized specifiers, if the latter appear on the opposite side of the head from its complement, and (ii) detecting the application of a movement rule, if a subcategorized complement appears on the "wrong" side of the governing head at Surface Structure.

A fourth claim can be extracted from the schemata of (1) — with some added interpretation. Jackendoff (1977) proposes to extend the X-bar schemata in "Remarks" so as to allow for a third bar-level, reserving the upper two levels for specifiers. (The extra bar-level has some plausibility, but it does not bear on the immediate discussion, and I will postpone considering it until Chapter 4.) Now Jackendoff argues that even in the three-level system, a basic property of the two-level system should be preserved, namely that every categorial rule have the skeletal form of (4):

$$(4) \quad X^n \longrightarrow \dots X^{n-1} \dots$$

Jackendoff observes that this kind of restriction rules out in principle the possibility of a given projection X^n dominating itself at the level of Deep Structure, so that adjunction structures can only result from the application of a transformational rule mapping from Deep Structure to Surface Structure.⁵

The fifth claim implicit in (1) is that every lexical category "projects" through the X-bar system into a set of categorial phrases. That is, if a preliminary morphological analysis of the lexicon provides the language faculty with the knowledge that a certain number of lexical

categories are differentiated, then the language acquisition device is tacitly prepared for the existence of a set of phrasal projections at each bar-level corresponding to each category. In fact, this can be strengthened to a necessity, given an additional principle proposed by Jackendoff (1977), to the effect that every non-head term in the expansion of a rule must itself be a maximal projection of some category. This has the consequence that any non-maximal projection X^{n-1} may only appear as the head term of the rule expanding X^n ; thus \bar{N} can only be introduced as the head of $\bar{\bar{N}}$, and N can only be introduced as the head of \bar{N} . This restriction has desirable consequences with respect to strict subcategorization: it implies that no verb can ever stipulate the hierarchical level of its complements; they must all be maximal projections. Moreover, no rule of phrase structure may stipulate that a phrase α^n may appear in a specifier position where α^{\max} may not. This obviously simplifies the task of learning the specifier system and has a significant consequence for the analysis of English prenominal adjectives, as we shall see in Chapter 4.

So it seems that the X-bar schemata proposed in "Remarks" lead to a number of plausible and potentially very powerful restrictions on possible phrase structure configurations at D-structure. These restrictions are summarized in (5):

- (5)
 - a. Every phrase is endocentric.
 - b. Specifiers appear at the $\bar{\bar{X}}$ level; subcategorized complements appear within \bar{X} .
 - c. The head always appears adjacent to one boundary of \bar{X} .
 - d. The head term is one bar-level lower than the immediately dominating phrasal node.
 - e. Only maximal projections may appear as non-head terms within a phrase.

(From (d) and (e) it follows that for each lexical category that can appear as a constituent of a phrase, there must be a set of corresponding phrase structure rules for each bar-level.)

Note that if the principles of X-bar theory outlined above are indeed inherent to the language faculty, the task of acquisition is limited to the development and elaboration of the categorial identity and mutual ordering of the terms at each hierarchical level. It is to this issue that we now turn our attention.

2. Inadequacies of the Categorial Component

2.1. Although the restrictions in (5) represent a tremendous advance over the theory of phrase structure in the *Aspects* model, there is still a lot of detailed and idiosyncratic information encoded into the formulae of individual categorial rules. Under standard assumptions, the theory of syntax has very little to offer to the theory of acquisition in the way of a set of predetermined hypotheses about what kind of detailed information to expect. To see this, consider the following categorial rules for $\bar{\bar{V}}$ and \bar{V} , drawn from Jackendoff (1977).⁶

$$(6) \quad \bar{\bar{V}} \longrightarrow (\text{have-en}) - (\text{be-ing}) - ([\text{Adv P}_{+Trans}])^* - \bar{V} - (\text{PP})^* - (\text{S})$$

$$(7) \quad \bar{V} \longrightarrow V - (\text{NP}) - (\text{Prt}) - \left(\left\{ \begin{array}{c} [+N] \\ \text{Adv P} \\ \text{QP} \end{array} \right\} \right) - (\text{PP}) - \left(\left\{ \begin{array}{c} \bar{\bar{S}} \\ \text{PP} \end{array} \right\} \right)$$

Both of these rules contain five non-head terms, each term being a maximal projection, in conformance with (5e). The categorial identity and the mutual ordering of these terms cannot be anticipated by the language faculty on the basis of any explicit set of principles of the theory of phrase structure. It is not obviously implausible that language acqui-

sition involves the task of constructing complex formulae such as (5) and (6) on the basis of induction from the primary linguistic data, but the process of induction would not be trivial, given the degenerate data base, as noted above; cf. Baker (1979).

The problem is magnified by the fact that the theory of generative grammar has traditionally assumed that the evaluation metric discourages the creation of numerous sets of similar categorial rules. Supposedly, markedness theory requires that rules be collapsed wherever possible, by means of abbreviatory conventions such as parentheses, asterisks, distinctive features, etc. Jackendoff (1977) argues that this kind of approach should be radically extended, given the existence of X-bar theory, so as to capture all significant generalizations of phrase structure holding for natural classes of syntactic categories by collapsing the categorial rules for the natural classes in question. In taking this line of research to its logical conclusion, Jackendoff relies upon many of the most powerful devices of classical generative phonology, as developed by Chomsky and Halle (1968). Specifically, in formulating the language-specific rules for English \bar{X} , $\bar{\bar{X}}$ and $\bar{\bar{\bar{X}}}$ structure, Jackendoff resorts to using braces, parentheses, asterisks, angled brackets, and other contextual conditions, thereby accounting for all the observed cross-categorial generalizations.

Consider what this means from the perspective of acquisition. This theory implicitly claims that from the perspective of acquisition, there is no distinction between an accidental cross-categorial generalization and one that springs from some deep principle of grammar. Rather, the same markedness theory that requires simplification in (6) and (7)

demands that every generalization that can be captured by the categorial rules must be so captured. Given the accidental arrangement of the primary linguistic data, this implies that virtually every categorial rule in the core of the grammar must be in constant revision throughout the period of acquisition, as the language faculty subconsciously reorders and collapses terms, consistent with each new generalization as it appears in the data. But if markedness theory operates in this way, then the accidental arrangement of the data ought to result in highly idiosyncratic patterns of linguistic development, each pattern dictated by the order in which the evidence is presented to a given speaker, with countless aborted attempts at rule collapsing at almost every stage. This kind of scenario is consistent with a view, once widely held, that the acquisition process essentially consists of subconscious theory construction, with new hypotheses continually being developed as previous hypotheses fail to accord with the observed facts. But if the use of overt negative evidence plays no significant role in first language acquisition, as the developmental data suggest, then this conception of the child-as-unconscious-scientist lacks plausibility, given the speed and uniformity of acquisition in the environment of a heterogeneous speech community.⁷

A more plausible account of the acquisition process involves a theory of a core grammatical structure, most of which holds constant across all languages, except for parameters with easily-identified empirical effects. According to this view, the ways in which individual grammars may differ are defined by the specific options that are left open at various points in the deductive structure of the grammar. The language-specific values for each of these parameters are presumably fixed, directly or indirectly, on the basis of straightforward overt evidence from the

linguistic environment. In contrast to the traditional hypothesis-testing model of acquisition, this parameter-setting theory allows us to view the development of grammar as being essentially deterministic. In other words, if the child's language faculty has predetermined expectations about the types of language-specific variation that are possible — and the type of evidence that is relevant for consideration in each case — then we might hypothesize that only in rare cases involving highly marked constructions will the child ever be "deceived" by the accidental arrangement of data into making a wrong guess about the grammatical structure that is instantiated in the data under consideration.⁸

The principles of X-bar theory fit in rather neatly with this general conception of acquisition because they identify specific points of predetermined structure where it is plausible to suppose that parametric variation is involved. An obvious example is the option of placing the head term in \bar{X} either to the left or to the right of its subcategorized complements. In these terms the theory of grammar can derive the distinction between SOV languages and SVO languages in terms of the two values allowed for the head position within \bar{X} . Whereas a verb-final language such as Japanese defines the structure of VP by instantiating the unordered \bar{X} schema as (8a), an SVO language like English instantiates the same schema as (8b):

- (8) a. $\bar{V} \longrightarrow \dots V$
 b. $\bar{V} \longrightarrow V \dots$

X-bar theory claims that the language faculty is prepared for either (8a) or (8b), and does not have to consider other logical possibilities consistent with a fixed class of data in order to learn the correct structure for VP. This well-defined option for parametric variation follows naturally

from the structure of X-bar theory, and ought to serve as a paradigm of the kind of contribution that the competence model can provide for the theory of acquisition. Other aspects of grammar which are subject to cross-linguistic variation should ultimately be accounted for in an analogous fashion: by means of specific options left open in the structure of the grammar, to be fixed on the basis of exposure to specific classes of evidence.

Unfortunately, the theory of phrase structure makes no real predictions beyond the realm of X-bar theory. In particular, the categorial identity and mutual ordering of complements and specifiers within each level is left completely open to random cross-linguistic variation. Virtually any string of phrases can appear in the expansion of any given rule, so there is simply not enough predetermined organization of terms for specific aspects of the rule expansions to be identified as isolated points in the structure that serve as the variables left open for parametric variation. In other words, a parameter-setting model of acquisition presupposes the existence of a highly articulated theory of invariant structure, and there is no theory of phrase structure that accounts for the distribution of non-head terms in this way.

2.2 Another problem is raised by the existence of non-configurational languages. (Traditionally, these are referred to as "free-word-order" languages, although "free-constituent-order" would perhaps be a more appropriate term.) In languages such as French, English and Dutch, the order of phrases is more or less fixed in most places, as the formalism exemplified in (6)-(7) claims. The situation in non-configurational languages such as Warlpiri and Japanese is rather different. Although

these languages usually have a fixed position for the head constituent,⁹ the order of all the non-head terms within each phrase is almost entirely free, as shown by the following example from Okinawan (a language related to Japanese):

- (9) a. [unu] [mi:^Vcinu] [aka-hiyosinu ^Vci^Vco:ru] hon
 the three red-cover wearing book
 'The three books that have red covers'
- b. [unu] [aka-hiyosinu ^Vci^Vco:ru] [mi:^Vcinu] hon
 c. [mi:^Vcinu] [aka-hiyosinu ^Vci^Vco:ru] [unu] hon
 d. [aka-hiyosinu ^Vci^Vco:ru] [unu] [mi:^Vcinu] hon
- (10) a. [^Vci^Vru:ya] [kiyo:kai ute:] [bo:^Vse:] kan^Vjabiran
 ci^Vru church in hat doesn't wear
 'Ci^Vru doesn't wear a hat in church'
- b. [^Vci^Vru:ya] [bo:^Vse:] [kiyo:kai ute:] kan^Vjabiran
 c. [bo:^Vse:] [^Vci^Vru:ya] [kiyo:kai ute:] kan^Vjabiran
 d. [kiyo:kai ute:] [bo:^Vse:] [^Vci^Vru:ya] kan^Vjabiran

Actually, the phenomenon of free constituent order is not entirely limited to the non-configurational languages; even in English, the placement of adverbs and PP complements is quite free, within certain limits.

Such phenomena are disturbing for the following reason. Although the theory of the categorial component does not provide a predetermined schema for the linear arrangement of non-head terms within a given level of X-bar structure, it does require that the grammar of every language develop a set of context-free rewrite rules to generate specific sequences of these terms at D-structure, despite the fact that there may be no direct evidence for any particular constituent order in the primary data.

2.3 It is of course conceivable that the language faculty has access to principles of markedness which provide the acquisition device with a set of unmarked ordered expansions for each hierarchical level. This would trivialize the problem of inducing a canonical order of constituents

even without overt evidence, since the unmarked ordering could be assumed without cost. In a non-configurational language, overt evidence in the primary data would motivate some sort of scrambling rule — appropriately constrained — to derive the free constituent order observed at Surface Structure.¹⁰

Although this might defuse some of the objections concerning acquisition, it is dubious that the formalism of context-free rewrite rules provides the optimal means of discovering or formulating explanations of unmarked constituent order. To see this, consider again the categorial rules (6) and (7):

$$(6) \quad \bar{V} \longrightarrow (\text{have-en}) - (\text{be-ing}) - ([\text{Adv P}_{+Trans}])^* - \bar{V} - (PP)^* - (S)$$

$$(7) \quad \bar{V} \longrightarrow V - (NP) - (\text{Prt}) - \left(\begin{Bmatrix} [\bar{+N}] \\ \text{Adv P} \\ \text{QP} \end{Bmatrix} \right) - (PP) - \left(\begin{Bmatrix} \bar{S} \\ PP \end{Bmatrix} \right)$$

Suppose — for the sake of discussion — that by some fortuitous coincidence, the placement of the terms in the expansions of (6) and (7) adhere exactly to the unmarked orders provided at no cost by the hypothetical markedness theory of the base. Then there could be no objections raised concerning acquisition. Nevertheless, these rules offer nothing whatsoever in the way of explanation.

Leaving aside the head terms, which are forced by X-bar principles, virtually every other aspect of the formulation of (6) and (7) amounts to a stipulation. Consider, for instance, the fact that in (6), $(PP)^*$ precedes (\bar{S}) instead of following it. Or the fact that $[\text{Adv P}_{+Trans}]$ occurs as the third term rather than, say, as the second, sixth, or seventh term. Why should the extra PP in \bar{V} appear in a disjunction with \bar{S} , rather than being included in $(PP)^*$, as in (6)? And why should (Prt) appear as the

second term rather than as the last? None of these arbitrary stipulations is a necessary fact; it might just as well have been the other way around. Even if these rules could be collapsed formally with those for other categories as Jackendoff suggests, they would still constitute a set of ad hoc arbitrary facts, albeit generalized across categories.¹¹ It is conceivable that the language faculty has evolved in accidental and arbitrary ways that defy explanation, but it is a simple tenet of scientific curiosity to search for reasons behind the facts, even if such a program ultimately proves to be unproductive.

3. Some Possible Revisions

3.1 There are various ways that one could respond to these objections, while still maintaining the assumption that ordered configurations of terms are defined by the base rules.

One possible response is that suggested by Hale (1979).¹² He proposes that configurational languages with fixed constituent order (English, Dutch, French, etc.) differ in a fundamental way from non-configurational languages such as Japanese and Warlpiri. The configurational languages are assumed to have a categorial component, thus deriving their hierarchical structure from the constraints imposed on base rules by the principles of the X-bar system. A fixed order of non-head terms within each level is required by the categorial rule formalism; the particular order is assumed to be set arbitrarily for each language. In contrast, the non-configurational languages have no categorial component according to this theory, so the order of non-head terms is entirely free.

Hale observes, however, that some aspects of constituent order, such as the position of the head, are fixed even in non-configurational

languages, but he suggests that these can be accounted for without assuming the existence of a categorial component. Instead, he invokes an interpretive parsing component, which builds a structural organization of a sentence as a step in the derivation of Logical Form. The parsing rules require certain constituents to appear before others in order to derive well-formed LF representations, so the parser serves as a kind of filter, making the categorial component unnecessary.¹³ Hale suggests that the cost incurred by the development of the parsing rules would be roughly equivalent, in terms of markedness theory, to the cost incurred by the development of categorial rules in the base component of a configurational language.

But if such a choice between components were a genuine option countenanced by the language faculty, it would raise significant problems for acquisition. Assuming that the acquisition device is programmed to develop skeletal categorial rules consistent with the principles of X-bar theory, one wonders at what point the language faculty gives up on its attempt to develop categorial rules when confronted with primary data from a non-configurational language. Suppose that the configurational option represents the unmarked case. In being exposed to Japanese or Warlpiri, the acquisition device would be led down the garden path by regularities of order which suggest the existence of a categorial component. Even if the non-configurational option represented the unmarked case, the dilemma would reappear in reverse: in being exposed to data from a configurational language, the acquisition device would first attribute the existence of regularities in constituent order to the influence of parsing rules. Moreover, it is unclear what the status of the two components would be in a language such as German, which falls some-

where in between English and Japanese with respect to freedom of constituent order.

It seems, then, that any approach that forces the language faculty to choose between a generative base component and an interpretive parsing counterpart — conceived of as distinct modules of grammar — simply exaggerates the problems associated with the poverty of the stimulus.

3.2 There are other possible responses to non-configurational phenomena which avoid this problem while still maintaining a set of generative categorial rules. Specifically, it would be possible to revise the theory of the base so that the rule expansions define unordered sets of terms at each level. Then the external distribution of categories would be determined by the categorial component in substantially the same way in all languages, and some other formal rule system would be required to account for the fixed ordering of these terms observed in configurational languages. It is never obvious, a priori, which rule system is responsible for a given phenomenon, especially in a theory of grammar that assumes the existence of interacting but distinct components. Syntactic constituent structures interact with virtually every other component in one way or another, and many of the facts of fixed constituent order in languages such as English could ultimately prove to be the result of principles governing other rule systems, just as the regularities of hierarchical structure proved to follow from X-bar principles.

But if the categorial rule expansions generate unordered sets of terms, then they are deprived of virtually all empirical content, since they are otherwise largely redundant in the overall structure of the grammar. Specifically, Chomsky (1981) observes that the phrase structure

rules recapitulate most of the information that is encoded independently in the strict subcategorization features of individual lexical entries. Leaving questions of order aside, this redundancy in the categorial system itself poses a serious conceptual problem.

Recall that the strict subcategorization features of a verb can be thought of as a set of addenda to specific positions in the verb's thematic grid — the verb's internal code for the complements with which it must co-occur in syntactic representations. The number of positions in the θ -grid determines the number of phrases that may appear as complements in \bar{V} , while the subcategorization features determine the categorial status of the complements. The subcategorization frames of all the verbs in the lexicon collectively determines all of the combinations of complements that can appear in \bar{V} .

But all of this information is repeated in the categorial rule (6), which thus has the status of a redundancy rule of the lexicon.¹⁴ Unlike other redundancy rules, however, the inclusion of base rules such as (6) does not lead to any simplification of the grammar, since all the subcategorization features must still be stipulated in the θ -grids of each lexical entry. Moreover, the categorial rule for \bar{V} is not unique in this respect; precisely the same situation obtains with respect to every other category at the \bar{X} level.

There is only one respect in which the categorial rules have the potential to simplify lexical entries, and this is with respect to the linear order in which the subcategorized complements appear. In the *Aspects* theory, the order of complements was explicitly specified in each subcategorization frame. This was not a necessary assumption, however, since there are no minimal pairs of verbs which differ solely in terms of

the order in which their complements must appear; thus it is never necessary to distinguish the subcategorization frames in (11) from those in (12):

- (11) a. [— NP - PP]
 b. [— PP - \bar{S}]
- (12) a. [— PP - NP]
 b. [— \bar{S} - PP]

If the categorial rules were to define a fixed order for constituents of a given type, then the lexicon could contain unordered subcategorization frames (or unordered θ -grids, in our terms¹⁵).

The categorial component thus finds itself in a paradoxical position with respect to subcategorized complements. There is only one respect in which the categorial rules for the \bar{X} level serve any useful function, namely the specification of the order of constituents. Even at the $\bar{\bar{X}}$ level, a theory of order-free categorial rules would be redundant, as we shall see in Chapter 4. This suggests that there is no empirical motivation for a theory of categorial rules unless they explicitly define fixed ordering of the non-head terms. But it is precisely this property of the categorial rule system which is entirely unmotivated in many languages, posing serious problems for acquisition, and which is completely arbitrary and devoid of explanatory force.

3.3 We have seen that the categorial component suffers from a number of empirical and conceptual problems. Attempts to solve these by revising the theory of the base seem to raise as many new problems as they solve. All of the difficulties that I have discussed arise from the fact that the formalism of context-free rewrite rules forces several distinct aspects of phrase structure to be stipulated within a single formula. The categorial

rules describe the environments in which phrases are found, the number of constituents that they may contain, the categorial status of each constituent, and even the linear order in which the various categories must appear. Some of these functions are redundant with respect to other component of the grammar, while others err in the opposite direction, defining fixed structures for which there is little or no empirical evidence. Moreover, the rule format has so much descriptive power that it has little explanatory appeal: categorial rules make use of linear order, categorial features, braces, parentheses, asterisks, bar-levels, and -- in some theories -- angled brackets and contextual conditions.

This situation is reminiscent of the theory of the transformational component prior to Chomsky's (1975) proposal to reduce the descriptive power of individual transformational rules by eliminating the use of contextual conditions. The immediate consequence of adopting this proposal was a temporary loss in the descriptive coverage of the grammar, but it forced the initiation of a search for explanations of the clusterings of properties that had been all too easy to program into rule statements in the Standard Theory.¹⁶

Clearly, an analogous radical reduction in the descriptive power traditionally attributed to individual categorial rules would force syntacticians to search for explanations of constituent order phenomena which are always easy to stipulate as properties of categorial rules. As a move in this direction, Hale (1980) proposes that the rule system associating categorial features with explicitly ordered positions can be formally dissociated from the system that defines hierarchical structure:

X-bar theory can be seen as presenting two dimensions along which phrase structure rules, and languages, can vary in type -- i.e.,

category ... and hierarchy ... Along the first dimension, one typological extreme would be a language in which all rules of phrase structure consistently generalize over all parts of speech ... The opposite extreme would be a language in which phrase structure rules are category specific.

This approach is pursued in some detail in Farmer's (1980) study of Japanese syntax. Farmer argues that there is a single categorial rule formula for Japanese phrase structure, defining simply a head position at the end of \bar{X} , with any number of preceding phrases, of an unspecified categorial type. Farmer suggests that lexical insertion is essentially context-free, in that there are no categorial features associated with any particular phrasal nodes by the base rules. Rather, phrases only acquire categorial features after lexical insertion, by means of feature percolation from the head position. Thus \bar{X} can be interpreted as \bar{N} only by virtue of N appearing in the head position of the phrase.

This approach achieves the desired result for Japanese, leaving the phrase structure rule system essentially category-neutral, a property which is reflected directly at Surface Structure. Nevertheless the status of the categorial rule system in configurational languages such as English is left unchanged under this account. Although the hierarchical structure of both languages would be derived from the same set of abstract principles of the X-bar system, the problems of explanatory adequacy in the English rule system remains. Moreover, it is not clear what kind of positive evidence would lead the English child immediately to the construction of complex categorial formulae, if the Japanese option of a category-neutral base exists.

A natural response to these objections is to extend the category-neutral base hypothesis to cover English as well. In other words, extrapo-

lating from the non-configurational languages, we can suppose that the phrase structure rules of all languages are unable to refer to categorial features. This would make it impossible for the rule system of the base to stipulate differences among the various categories with respect to external distribution of internal structure. Effectively, this would eliminate the categorial component in the traditional sense, leaving only a formal medium for the expression of cross-categorial properties of hierarchical structure, such as the X-bar principles of (5) and other generalizations referring to the same set of primitive terms.

Obviously, any theoretical revision as sweeping as this is bound to have significant consequences in many otherwise unrelated domains. Without a categorial component, every aspect of fixed constituent order within a given bar level would have to be accounted for in other terms. Structural positions which appear to occur in the phrasal projections of some categories but not of others would have to be explained. The external distribution of constituents of distinct categories would have to be related to other rule systems. At first blush, the whole enterprise might seem to be a pointless notational shift from one component of the grammar to another. Clearly, it is always reasonable to resist notational revisions unless there is significant benefit to be derived from accepting them. In the case of the categorial component, however, these objections can be answered on two grounds.

First, most of the problems that arise in eliminating the categorial component relate to the descriptive coverage of the grammar. If most of the phenomena traditionally represented in rule formulae such as (6) and (7) can be captured in other ways, then nothing is lost in terms of descriptive adequacy. The real problem with the categorial component is that

descriptive adequacy comes too easily, with a concomitant lack of explanation. Once one makes the conceptual shift of demanding explanation rather than mere notational representation, the inevitable temporary loss of descriptive coverage in certain domains is not serious, if it is offset by corresponding gains in terms of explanatory accounts of other phenomena. I believe that such gains are forthcoming, as I hope to show in the following chapters.

A second reason for accepting the proposed revision is empirical. It turns out that the elimination of the categorial component forces very specific analyses of a number of constructions, which often differ radically from previous accounts that depended in whole or in part upon the possibility of referring to stipulations in categorial rules. In many cases, the revisions that are forced by the theoretical shift are far from obvious in the context of traditional assumptions. Strikingly, however, it seems that where empirical differences emerge, the new analyses make the correct predictions, often with respect to phenomena that were either unnoticed or unaccounted for previously. Although such empirical differences are really arguments against specific analyses rather than against the categorial component itself, I think that a good case can be made for guilt by association. In other words, if the rules of the categorial component serve as a mask for essential problems in those domains where they are not redundant, then it is reasonable to conclude that the generalizations which they express are largely epiphenomena rather than the actual rules which underlie the facts.

4. A Category-Neutral Base

4.1 The preceding discussion has been prevailingly negative, pointing out problems of an empirical and conceptual nature with the assumption

that representations of phrase structure are derived by categorial rules of traditional type. I would now like to turn to the more constructive task of sketching out briefly what the theory of the base might look like in the absence of such rules.

As we have seen, a category-neutral base will only allow for the expression of structural principles referring to the same primitive terms as those which the X-bar principles in (5) make reference to:

- (5)
- a. Every phrase is endocentric.
 - b. Specifiers appear at the $\bar{\bar{X}}$ level; subcategorized complements appear within \bar{X} .
 - c. The head always appears adjacent to one of the boundaries of \bar{X} .
 - d. The head term is one bar-level lower than the immediately dominating phrasal node.
 - e. Only maximal projections may appear as non-head terms within a phrase.

The basic primitives of the theory are: (i) terms referring to hierarchical levels based on projections of categorial variables (X , \bar{X} , $\bar{\bar{X}}$, etc.), (ii) sequential notions such as "left", "right", "adjacent", and "boundary", and (iii) terms referring to structural relations, such as "domination", "immediate domination", "head", "non-head", and "phrase". Other terms such as "endocentric", "maximal projection", "sister", "c-command", and "government" can be derived from these.

Actually, (5b) also makes crucial reference to notions other than those which are based on the primitive terms of phrase structure. Specifically, it refers to the notions "specifier" and "subcategorized complement", which are defined in terms of the theories of Logical Form and the Lexicon. In this respect, (5b) is not part of the same natural class of principles as (5a,c,d,e) and should probably be thought of as a rule mapping between components of grammar, rather than as a basic X-bar principle on par with

the others. It is perhaps not coincidental that (5b) is the only one of these principles that appears to be subject to parametric variation. Recall that languages such as Japanese and German allow specifiers to appear within the \bar{X} level, situated between the head and its complements, as observed in section 1.2. Viewed in these terms, we can think of (5b) as one of the options for mapping from S-structure to LF that the language faculty is tacitly prepared to encounter, rather than as an inviolable principle of grammar.

As the preceding discussion suggests, the determination of the principles of the theory of phrase structure is an empirical issue. Nevertheless, by restricting the vocabulary of the theory to primitive terms relating exclusively to structural notions, we introduce a natural distinction between principles of the theory of phrase structure on the one hand, and rules mapping between component on the other. In these terms, we might hypothesize that each component of grammar has a core set of principles which are defined exclusively in terms of the primitives of that component. It may be that such principles are invariant across languages, while only the "hybrid" rules referring to notions from more than one component are subject to parametric variation. Conceptually, this is a plausible basis for distinguishing invariant principles from variable rule systems, since it is a direct reflection of the modular structure of the grammar. The clear implication is that the grammatical components of the language faculty have developed independently of each other, leaving the possibilities of mapping between the components somewhat indeterminate, apart from the limits imposed by the internal properties of each system.¹⁷

4.2 In addition to the parametric variation with respect the degree

of articulation of hierarchical levels, we have also observed that languages differ in terms of whether the lexical head of the phrase appears at the left or the right boundary of \bar{X} , as is reflected in the distinction between SVO and SOV languages. One consequence of adopting the hypothesis of a category-neutral theory of the base is that it should be impossible to set this option differently for each category. Thus a language with a \bar{V} -final head position for the verb should also have an \bar{X} -final head position in PP, AP, and NP. In fact, the range of typological variation with respect to constituent structure reveals that this prediction is usually born out, as indicated by Greenberg's (1963) observations about constituent order.

Some of Greenberg's observational universals are not absolute, and refer to correlations which hold with "overwhelmingly greater than chance frequency". Jackendoff (1977) attributes Greenberg's universals to the influence of the markedness theory of the base, which favors collapsing categorial rules wherever possible; this would account for the general correlations, while still leaving open the possibility of category-specific rules in some cases. Clearly, this option is unavailable to us if the theory of phrase structure does not allow for specific rules defining the structural properties of each category, and other explanations must be found.

To illustrate, let us consider a specific example. Koster (1975) argues that Dutch has an SOV structure, so the position for the verbal head must be at the right boundary of \bar{V} . On the other hand, Dutch has prepositions, and the derived nominal may precede its complements. Prima facie, this appears to call for specific X-bar rules for each category. But on closer examination, it seems that Dutch may actually be utilizing

a previously unobserved third option for the instantiation of the universal schema for \bar{X} in (1b). Specifically, whereas English places the head at the left boundary of \bar{X} and Japanese places it at the right, Dutch allows for both head positions to be realized. Although this is a unitary phenomenon from the perspective of the Dutch X-bar system, it is utilized in slightly different ways for each category. In the verbal system, the double-headed \bar{X} structure is realized in terms of the familiar contrast between subordinate and main clauses; this relates to the so-called V-fronting rule. More precisely, we can interpret V-fronting as a shift from the \bar{V} -final head position to the \bar{V} -initial head position; this rule will be considered in greater detail in Chapter 3. In the adjectival and prepositional systems, the double-headed structure has a different effect. Van Riemsdijk (1980b) observes that certain adjectives precede their complements, while others follow them. Apparently there is some lexical property which determines which of the two head positions the adjective will appear in. A similar situation obtains in \bar{P} , as shown by the fact that Dutch has both prepositions and postpositions; individual prepositions differ in complex ways according to which positions they may occupy. The patterns of lexical variation may be partly controlled by principles of Case theory, as I shall suggest in Chapter 7. Of the four categories, it seems that nouns alone are restricted to the \bar{X} -initial head position, for reasons that remain obscure.¹⁸

Note that if the parameter determining the placement of the head position in \bar{X} takes the form of language-particular instantiations of the unordered X-bar principle (5c), then this would be an example of parametric variation within a single component, since the parameter is stated exclusively in the primitive terms of the theory of phrase structure. This

interpretation is inconsistent with our hypothesis that parametric variation is limited to rules mapping between components.

There are a number of ways that we can respond to this. First of all, we could weaken our claim about parametric variation in the following way. Instead of holding that all of the internal structure of the rule system of a given component is entirely predetermined, we could make the converse claim, i.e., that all the rules mapping between components are open to cross-linguistic variation. This would preserve the essential insight of the previous claim, i.e., that the modular structure of the grammar is reflected in terms of the degree of predetermined structure.

Another possible response would be to eliminate the terms "left" and "right" from the primitives of the theory of phrase structure, attributing them instead to the component which maps hierarchically-defined S-structure representations into the linear configurations of Surface Structure.¹⁹ We might then suppose that the "double-headed" \bar{X} structure of Dutch is actually implicit in every language, by virtue of taking (5c) as the exhaustive definition of "head position". Then the actual placement of the lexical head at one boundary as opposed to the other might be determined by language-particular rules mapping between X-bar representations at S-structure and linear-oriented Surface Structures. If all aspects of left/right ordering were captured in this way, there might also be interesting consequences for the analysis of conjunction structures.²⁰

Still another possibility would be to exploit the fact that the left/right orientation of the \bar{X} level is a function of the placement of the lexical head. Then it would not be necessary to assume that the phrase structure component is responsible for determining which boundary the lexical head must be adjacent to in a given language, since the parametric

variation could be attributed to the rules of lexical insertion. Since these rules involve lexical entries as well as phrase structure configurations, we could view them as mapping between the Lexicon and the phrase structure (X-bar) component.

It is unclear which of these alternatives is preferable. It is even conceivable that the placement of the head is linked to the rules which project the complement structure of the verb into syntactic representations, as suggested by the apparent correlation between the placement of the lexical head and the degree of articulation of hierarchical structure. Thus English and French both have \bar{X} -initial heads, and maintain a structural distinction between the \bar{X} and $\bar{\bar{X}}$ levels, whereas Sanskrit and Japanese have \bar{X} -final heads, and appear not to distinguish the \bar{X} and $\bar{\bar{X}}$ levels. At present, there is no obvious theoretical connection between these two distinct options, but if the correlation is significant, then it is possible that both properties follow in some way from the relationship between Strict Subcategorization and phrase structure configurations.

In addition to the two levels of hierarchical phrase structure defined by the \bar{X} and $\bar{\bar{X}}$ shemata in (1), it may be that further distinctions of hierarchical structure are justified. Jackendoff (1977) argues for a distinction between two levels of specifiers, as noted above. Similarly, the subject position may be defined in terms of a structural position at a distinct bar-level from that of other specifiers. I will consider some of these issues in Chapter 4.

4.3 Let us now turn our attention to the classes of positions in which referring expressions (NP, PP, \bar{S} , etc.) may occur. We can call these positions R-positions. Recall that arguments may appear either as subcatego-

rized complements in \bar{X} or else as subjects, outside of the complement structure. Following the terminology of Chomsky (1981), we will refer to these positions collectively as A-positions, since these are positions which can be related to the argument structure of a predicate.

In certain constructions, referring expressions appear at S-structure in structural positions that are normally not subject to θ -role assignment. Two examples of such constructions are those of WH-movement and Topicalization:

- (13) a. I wonder [_S which book [_S John read —]]
 b. This is the table [_S on which [_S Jim put his drink —]]
- (14) a. [This book, [_S I think that John read —]]
 b. [On this table, [_S Jim put his drink —]]

The COMP position in (13) and the Topic position in (14) have special properties that distinguish them from other R-positions (i.e., from the A-positions in \bar{X} and $\bar{\bar{X}}$). Normally, an argument may only appear in Topic or COMP position when there is a corresponding "gap" in an argument position within S. The proposed referring expressions in (13)-(14) are linked to the obligatory gaps by virtue of the syntactic rule *Move α* , which relates S-structure representations to D-structure representations. The Topic or WH-phrase appears at D-structure in the same A-position that is occupied by the gap at S-structure. The gap is therefore the trace left by *Move α* .

We can also understand the function of the obligatory gap in the following way. The Topic and COMP positions can never satisfy the thematic requirements of any predicate; they are never θ -positions, in the relevant sense. Rather, it is the trace position in S which satisfies the requirements of the verb. Since the Topic and COMP positions are never directly linked to the argument structure of a predicate, we can refer to them as

non-A-positions.²¹

In general, it seems that constructions involving non-A-positions instantiate a relation that is quite analogous to that holding between a quantifier and the variable that it binds. More precisely, we can think of the Topic or COMP positions as corresponding in some sense to an operator position, while the trace functions as a variable; cf. May (1977) and Chomsky (1980) for suggestions along these lines. In this sense, we can think of the variable itself as being an argument, while the referring expression in the non-A-position plays the role of a kind of quantifier. We will return to this notion in greater detail in Chapter 3.

In addition to the S-structure non-A-positions in (13) and (14), there are certain non-A-positions that are created by virtue of adjunction rules applying in Logical Form. May (1977) proposes that Quantifier Phrases (QPs) may be adjoined to S in LF configurations, so that the quantifier phrase can bind its trace in the argument position as a variable. Such structures are directly analogous in this respect to the WH-movement constructions that are derived syntactically by *Move α* . The Quantifier Extraction construction is exemplified in (15b), which is a simplified version of the LF representation for (15a) on the interpretation of the sentence where the object QP every man takes broad scope over the entire sentence.

- (15) a. [_S Two dogs [_{VP} chased every man]]
 b. [_S [every man]_i [_S two dogs [_{VP} chased t_i]]]

At Logical Form, the QP appears in a position that does not exist in the S-structure or D-structure representations. Since this functions as an "operator" position rather than a position which fulfills the requirements

of the argument structure of some predicate this too is a non-A-position by our criteria.

We are now in a position to formalize the distinction between A-positions and non-A-positions in structural terms. The argument positions that we have considered all fall within an X-bar projection, either at the \bar{X} or the $\bar{\bar{X}}$ level. (Recall that if S is a projection of INFL, then the subject position is within the $\bar{\bar{X}}$ projection, where $S = \bar{\bar{I}}$.) The non-A-positions that we have observed (i.e., COMP and the S-adjoined position) both fall outside of S. We could generalize from these two positions to suggest that a non-A-position is a sister of S, as in (16):

- (16) a. $[\bar{S} [\alpha] S]$ (\bar{S} structure)
 b. $[S [\alpha] S]$ (S-adjunction structure)

It seems, however, that we can make a more general claim, consistent with a category-neutral conception of phrase structure. Robert May has observed (personal communication) that there is evidence that QPs may have scope domains that correspond to each major category, suggesting that QP may adjoin to the maximal projection of any category. Thus in the reading for (15) where the object QP takes narrow scope, we can assume that the object QP appears at LF in a non-A-position adjoined to VP. In a similar vein, I shall suggest in Chapter 3 that in "Heavy NP Shift" constructions the shifted NP appears at S-structure in a non-A-position adjoined to \bar{V} .

Suppose that these proposals are correct. Then if S is equivalent to $\bar{\bar{I}}$, as in (3) above, we can formulate a generalized definition of non-A-position in category-neutral terms:

(17) Non-A-Position (Definition)

In the configuration $[_Y \alpha \beta]$, α is a non-A-position with respect

to β , if

- (i) γ is a projection of β , and
- (ii) $\beta = \bar{\bar{X}}$, and
- (iii) α and β are both immediate constituents of γ

Condition (i) prevents an A-position in \bar{X} from counting as a non-A-position with respect to some other complement. Condition (ii) prevents specifiers of \bar{X} (including subjects) from counting as non-A-positions with respect to the constituents of \bar{X} . Condition (iii) prevents subconstituents of α from also counting as non-A-positions with respect to β . Since (17) refers exclusively to the category-neutral primitive terms of X-bar theory, we can consider it to be an invariant definition in the theory of phrase structure.

Recall that a constituent dominated by $\bar{\bar{X}}$ is a specifier. By virtue of the definition in (17), a constituent that is a sister of $\bar{\bar{X}}$ is a non-A-position. These definitions overlap in the case of structures involving adjunction to $\bar{\bar{X}}$, since the adjoined constituent is both dominated by $\bar{\bar{X}}$ and a sister of $\bar{\bar{X}}$. In other words, the position adjoined to $\bar{\bar{X}}$ is both a specifier and a non-A-position; this has an interesting consequence, as we shall see in Chapter 6.²²

It may be that some minor adjustments are called for in (17). In particular, (17ii) does not permit a constituent to be interpreted as a non-A-position unless it is a sister of $\bar{\bar{X}}$. This would have a rather curious consequence in languages such as Sanskrit and Japanese, if they do not reflect a structural distinction between the \bar{X} and $\bar{\bar{X}}$ levels at S-structure, as suggested by Hale (1980) and Farmer (1980). Specifically, if there is no $\bar{\bar{X}}$ level in such languages, then there could be no non-A-positions, according to (17ii). It is true that these languages don't have any equi-

valent to the English COMP position -- as (17) would predict -- but it is not clear that this correlates specifically with the absence of \bar{X} .²³ Moreover, even these languages must presumably allow for non-A-positions at LF in order to allow for the interpretation of quantifiers (cf. fn. 22). Perhaps the relevant distinction between \bar{X} and $\bar{\bar{X}}$ is instantiated at some other level in these languages -- either at LF or at some enriched syntactic representation, as suggested by Marantz (1981) and Vergnaud and Zubizarreta (to appear). Alternatively, we could adjust (17i) so as to require that β be a maximal projection, where "maximal" is defined on a language-specific basis.

4.4 This concludes our discussion of the theory of the base component in the context of a theory of grammar which does not contain categorial rules of the traditional type. By depriving the phrase structure component of the power to refer to categorial features, we impose a very strong constraint on the descriptive power of individual phrase structure rules, effectively reducing the vocabulary of the base to the primitive category-neutral terms of X-bar theory.

Despite this reduction in descriptive capacity, we have seen that it is possible to develop a rigorous characterization of various phrase structure configurations, distinguishing among several levels of hierarchical structure. X-bar theory also distinguishes between head positions and non-head positions, and among the latter, distinguishes specifier position from complement positions. The R-positions are also cross-classified in terms of the distinction between A-positions and non-A-positions. As we have seen, specific parameters can be defined in terms of the formal structure of X-bar theory, resulting in an explanatory typology of cross-

linguistic variation.

Nevertheless, the elimination of categorial rules results in an immediate reduction in the descriptive coverage of the grammar, and other explanations must be found for the phenomena that have been traditionally accounted for in terms of stipulations in the categorial rule formulae of the base. It is to this task that the following chapters are devoted. Chapter 3 describes in some detail how the distribution of subcategorized complements can be derived from the general principles of Case Theory and θ -role assignment. Chapter 4 discusses the distribution of subjects and modifying clauses in various types of phrases. Chapter 5 discusses a number of apparent counterexamples to the principles developed in Chapters 3 and 4, and accounts for them in terms of rules of word-formation, developed in somewhat novel terms. Chapter 6 discusses the internal structure of S and \bar{S} , operating within the assumption that these categories are also structured according to general principles, rather than in terms of a categorial formula of the familiar sort. Chapter 7 explores some of the implications of the theory of word-formation developed in Chapters 4 and 5, and develops a theory of constraints on Reanalysis rules which accounts for the distribution of preposition stranding constructions in various languages.

FOOTNOTES: CHAPTER 2

1. This is true even in the case of morphological rules that are overgeneralized at certain points during the acquisition process, as for instance with irregular verb forms. It seems that the child learns not to overapply the rule by virtue of the positive evidence of learning the suppletive forms, rather than by the negative evidence of correction. See Kiparsky (forthcoming) for related discussion of special rules taking precedence over general rules.
2. The starting point for much of this work is Ross's (1967) thesis, which developed a theory of general constraints on syntactic movement rules. Susequent work in the framework of the Extended Standard Theory (in particular, Chomsky 1973, 1976, 1977) has formed the basis of a theory of rule conditions that need not be learned separately for each construction, but rather can be attributed to the innately determined properties of the language faculty.
3. Among the contributions to this literature are Bresnan (1972, 1976), Williams (1975), Hornstein (1977), Jackendoff (1977), Hale (1978), and Marantz (1980).
4. Hornstein (1977) takes the position that the structure of S is not determined by the X-bar system, arguing that it is not a projection of V. (For a contrary view, see Jackendoff 1977 and Marantz 1980.) Ken Hale has suggested in unpublished work that AUX is the head of S; similarly, Chomsky (1981) proposes that the head of S is the INFL constituent, which corresponds (more or less) to the AUX position in previous theories. Note that if INFL is the head of S, then Hornstein's arguments do not necessarily force the assumption that S is outside of the X-bar system.

5. Although Jackendoff's proposal is extremely attractive, I will deviate from it in Chapter 4, by assuming that specifiers may be adjoined to any bar-level in the base. See Chapter 4 for discussion.

6. I have made one or two minor changes in Jackendoff's formulation of these rules for ease of exposition. The third term in (6) is represented as an X''' expansion in Jackendoff's formulation; this represents a maximal projection in his system. The fourth and sixth terms in (7) are represented as distinctive feature matrices by Jackendoff. Because I have not adopted his feature system, I have chosen to break down these terms into the disjunctions of categories that his formulation captures; it is important to note, however, that each disjunction is a natural class in his system.

I have used Jackendoff's rules as examples primarily because I believe that they represent the most serious and detailed published account of English phrase structure within a reasonable version of X-bar theory. Although I will criticise the arbitrary nature of these formulae at a later point in this chapter, these objections are not directed at the analyses developed in Jackendoff's very careful and informative study; rather, they are directed at the lack of genuine explanation in the theory of phrase structure implicit in much recent work, which Jackendoff's account pursues to its logical conclusion.

7. See Baker (1979) and the references cited there for related discussion; also fn. 1 above.

8. One interesting example of this type of highly marked construction involves the class of Subject Control verbs that appear to violate Rosenbaum's (1970) Principle of Minimal Distance. Carol Chomsky's (1969) study shows that these constructions pose significant difficulties for children during

the acquisition period in a systematic fashion. See Chapter 5, Section 6.1 for a discussion of this problem.

9. For instance, the verb appears as the rightmost constituent of the sentence in German, Okinawan, and Japanese -- at least at the level of D-structure. Similarly, Warlpiri reserves a slot for the auxiliary as the second immediate constituent of S; this is presumably the head position of the predicate phrase, equivalent to INFL in (3) above.

10. The status of Scrambling is somewhat suspicious in itself. It cannot be an adjunction rule or a substitution rule, but rather must freely reorder terms within a given bar level; this is uncharacteristic of syntactic rules. One might suppose that Scrambling is some kind of stylistic rule, but D. Pesetsky has informed me that Scrambling has effects on anaphora in Russian, and similar facts have been observed by K.P. Mohanan in Malayalam. These considerations suggest that Scrambling really represents no more than free base order, as suggested by Hale (1980).

11. Jackendoff's analysis represents the only serious attempt to collapse the phrase structure rules of a number of categories at a really detailed level. As he observes, however, the formulation of the collapsed rules is unsatisfactory, suggesting that significant cross-categorical generalizations about constituent order should not be captured in this notation.

12. In a latter version of this paper, Hale revises his account, suggesting that even the nonconfigurational languages may have an (impoverished) instantiation of X-bar structure. I have chosen to discuss the original form of Hale's proposal, since it is a logical response to the phenomenon of free-constituent order, and is worthy of consideration.

13. It may be significant that many of the non-configurational languages appear to lack syntactic movement rules, suggesting on independent grounds that the D-structure representations may be equivalent to the S-structure representations in these languages, at least with respect to constituent structure. The absence of traces removes some of the motivation for phrase structure rules, as has been noted, e.g. by Farmer (1980).

14. Actually, as Chomsky has observed (MIT lectures, 1981), the phrase structure rules could not even constitute a complete set of redundancy rules, since they are incapable of representing optionality in strict subcategorization frames. Thus if a phrase XP appears as an optional term in a categorial rule, this tells us nothing about whether XP appears as an optional or obligatory term in individual subcategorization frames; it merely states that the term appears in some frames but not in others.

15. In Chapter 3, Section 8.1, I will argue that there is actually empirical evidence against the claim that a fixed order of terms is defined at D-structure. The relevant evidence concerns the contrast between active and passive structures with respect to the interaction between clausal complementation and preposition stranding in \bar{V} .

16. It is important to observe that there is no advantage in eliminating the transformational rule system if the stipulative power of the transformational rules of the Standard Theory is simply transferred to the rules of the Phrase Structure component or the Lexicon. A theory of grammar which maintains syntactic movement rules in a drastically constrained form (allowing very little in the way of language-particular stipulations) constitutes a significantly more restrictive theory of grammar than one which permits construction-specific lists of the abstract grammatical

properties of individual constructions in some other component. For a contrary view, see Bresnan (to appear) and Gazdar (1981).

17. Much of the current interest in parametric variation finds its roots in Rizzi's (1978b) proposed parametrization of bounding nodes in his discussion of apparent Subjacency violations in Italian. Much recent discussion has centered on the so-called Subject pro-drop parameter, which distinguishes languages such as Italian and Spanish from languages like English and French. See Borer (1981) for some discussion of the possible range of parametric variation.

18. It is conceivable that the position of the noun is determined by the principles governing the matching of Case and agreement features, if the \bar{X} -initial position is the only one from which morphologically adjoined grammatical features can "percolate" to the phrase as a whole.

19. This recalls Hale's (1979) suggestion that some aspects of order may be attributed to the rule system mapping from the linear sequence of terms in the surface string to the hierarchical structure of grammatical representations.

20. Specifically, the assumption that certain aspects of linear order are left undetermined in the syntactic component of the grammar is consistent with Williams' (1978) theory of conjunction structures, according to which conjuncts are superimposed in syntactic representations, and then linearized in the mapping between grammar and actual speech.

21. Chomsky (1981) refers to these \bar{A} -positions. I have used the term non-A-position so as to avoid confusion with the \bar{X} -level projection of AP -- \bar{A} .

22. The consequence alluded to in the text relates to the status of

the trace of an extracted specifier phrase with respect to the Empty Category Principle. In Chapter 6, I will adopt a proposal due to Jim Huang (personal communication), according to which specifiers to S may appear in COMP at D-structure.

23. Conceivably, the lack of a COMP position in these languages could follow from sentences being projected from VP, rather than from INFL.

CHAPTER THREE: THE ORDER OF COMPLEMENTS

In this chapter, I will develop in some detail an account of the order of constituents within the level of complement structure. We have already seen that X-bar theory provides a principled distinction between the placement of the specifiers of \bar{X} on the one hand, and the placement of the complements of the head on the other. Whereas the specifiers (including the subject and any modifying phrases) normally appear in a peripheral position, the complements usually appear closer to the head, "inside" the shell occupied by the specifiers. But within each level of hierarchical structure, X-bar theory is neutralized: it does not predict any specific order of constituents within a given bar-level. In many languages, the order within each level is in fact quite free, apart from the placement of the head at the beginning or the end of \bar{X} . But in languages such as English, there are many complicated restrictions on the respective order of constituents, especially for the complements of the head within \bar{X} .

Now if the base component does not contain a set of phrase-structure rules, even of the restricted type developed by Jackendoff (1977), then there are only two ways of accounting for the fixed order of complements in languages like English. First, in the spirit of Williams (1975), one might argue that such languages have a more highly-articulated complement structure defined by the X-bar system. Thus if the theory of grammar were to provide some criterion for distinguishing among the various types of complements in category-neutral terms, then each type could be assigned to a specific bar-level, thereby deriving an ordering of the complements by exploiting the basic principle of X-bar theory. The second possible approach would be to claim that even in configurational languages such as English, the order of complement phrases is actually indeterminate, from

the perspective of the theory of phrase structure. Such a theory would then be forced to appeal to independent principles of grammar in order to derive the fixed constituent order which is observed at S-structure.

A priori, there is no principled reason to favor either of these approaches over the other; both are entirely consistent with the restrictive category-neutral theory of phrase structure which we are assuming, and the choice between them can be made on strictly empirical grounds. One might even be prepared to discover that some combination of the two hypotheses could prove to be correct. In fact, however, it seems that the weight of empirical evidence entirely supports the second hypothesis over the first, even where an extension of X-bar theory appears to be quite plausible at first glance. In other words, X-bar theory turns out to play no role whatsoever in determining the fixed order of complements in languages such as English, beyond the limited contribution that we discussed in the previous chapter. To see this, it is necessary to take a careful look at the facts of constituent order within \bar{X} , a task to which we now turn.

1. The Location of Direct Objects

1.1 Let us begin with the distribution of direct object NPs within \bar{X} . Recall that the object of a verb or preposition must immediately follow its head:

- (1) a. Paul retrieved [the books] from the trash can
Neil donated [ten dollars] to the fund
- b. $\#$ *Paul retrieved from the trash can [the books]
 $\#$ *Neil donated to the fund [ten dollars]
- (2) a. Jack walked from [Boston] to New York
Ted talked to [his kids] about the war
- b. *Jack walked from to New York [Boston]
*Ted talked to about the war [his kids]

The sentences in (1b) are marked with a "#*" so as to indicate that they are marginally acceptable as "Heavy NP Shift" constructions. Now in any study of the order of complements, it is absolutely crucial to filter out the effects of this rule. Ever since Ross's (1967) discussion of Heavy NP Shift, it has consistently proved to be virtually impossible to define "heaviness" in a satisfactory way. In fact, it seems that the rule postposing the object NP in this construction can apply quite freely; acceptability judgments seem to vary considerably, depending upon paramgrammatical factors relating to discourse function and related phenomena. Rochemont (1978) observes that Heavy NP Shift can apply freely to indefinite NPs, regardless of weight:

- (3) a. Kevin gave to his mother [a new book]
 b. Brian brought back to America [a priceless treasure]

Rochemont shows that the construction is used to focus the postposed constituent, and suggests that the rule involved should really be called "Focus NP Shift". When this rule applies to a prepositional object, pied-piping is obligatory (cf. 2b):¹

- (4) a. John counted [upon a mysterious stranger] for support
 b. John counted — for support [upon a mysterious stranger]
 c. *John counted on — for support [a mysterious stranger]

It is possible to control for Focus NP Shift by considering the order of complements in a gerund clause, the propositional content of which is presupposed. (Gerunds are factive, in the sense of Kiparsky and Kiparsky, 1968.) Due to the effect of presupposition, a postposed object NP cannot be construed as a focussed constituent, and the grammaticality judgments are much more obvious than in (1b):

- (5) a. [Paul's having retrieved the cereal box-top from the trash can] surprised me
 b. [Neil's donating ten dollars to the fund] was a nice gesture
- (6) a. *[Paul's having retrieved — from the trash can the cereal box-top] surprised me
 b. *[Neil's donating — to the fund ten dollars] was a nice gesture

A comparison of (5) and (6) clearly shows that a direct object NP must immediately follow a governing verb or preposition, abstracting away from Focus NP Shift phenomena.

How should this restriction be captured in a theory of grammar which does not include base rules such as (7)?

- (7) a. $\bar{P} \rightarrow P - NP \dots$
 b. $\bar{V} \rightarrow V - NP \dots$
 c. $\bar{X} \rightarrow X - NP \dots$

One initially plausible approach would involve an elaboration of X-bar theory, as noted above. Suppose that X-bar theory were to define a "Small XP", in the sense of Williams (1975), comprising a head and its "closest argument" (cf. van Riemsdijk, 1980). Let us call this "Small XP" x' .² The "closest argument" position in x' would have to be defined in category-neutral terms, since X-bar theory makes exclusive use of variables, and may not refer directly to categorial features per se. We would then posit the X-bar rules (8):

- (8) a. $\bar{X} \rightarrow x' \dots$
 b. $x' \rightarrow x - \alpha$ (α = the closest argument)

Although α is category-neutral, a lexical head could still strictly subcategorize for a closest argument of a specific category. Then for some head x , α might always be NP; in other cases, it might be PP, \bar{S} or whatever. In this way, X-bar theory would interact with strict subcategorization

to derive the fact that a direct object NP appears adjacent to its head.

1.2 There are two problems with this type of account, however. The first of these concerns the direct object complements of derived nominals. According to (8b), we would expect an object of a noun to appear in exactly the same position as the object of V or P. But this is not the case; the order of complements is much looser in \bar{N} than is predicted by (8):

- (9) a. [Paul's retrieval of the cereal box-top from the trash can] surprised me
- b. [Neil's donation of ten dollars to the fund] was a nice gesture
- (10) a. [Paul's retrieval from the trash can of the cereal box-top] surprised me (cf. 6a)
- b. [Neil's donation to the fund of ten dollars] was a nice gesture (cf. 6b)

Now derived nominals do not differ from gerunds with respect to factivity, so Focus NP Shift cannot be invoked to distinguish (10) from (6). Some other principle would be required to distinguish between objects in V' and objects in N'.

A similar problem for (8) concerns direct objects which have the categorial status of \bar{S} rather than of NP. These usually appear after all other subcategorized constituents, despite the fact that they normally function as the "closest argument" of the head. This is especially striking with verbs whose closest argument can be either NP or \bar{S} :

- (11) a. Did [Sally's mentioning her problem to the doctor] surprise you?
- b. *Did [Sally's mentioning to the doctor her problem] surprise you?
- (12) a. *Did [Sally's mentioning that there was a problem to the doctor] surprise you?
- b. Did [Sally's mentioning to the doctor that there was a problem] surprise you?

This would make sense if NPs are only shifted to the end of \bar{V} in order to be focussed and if \bar{S} appears at the end of \bar{V} due to some independent principle. Then there would be a straightforward explanation for the otherwise mysterious contrast between NP objects and \bar{S} objects in (11) vs. (12). Notice, however, that such a principle would effectively render (8) vacuous. In fact, (8) appears to hold only for NP-complements in \bar{V} and \bar{P} ; if the category of either head or complement changes, then (8) is regularly violated. These differences cannot be accounted for in terms of phrase structure rules unless these rules are allowed to make use of categorial features to distinguish objects of [-N] heads from objects of [+N] heads, and to distinguish NP objects from \bar{S} objects. Since it is desirable to deny the categorial rules the descriptive power necessary for such stipulations, we must look elsewhere in the structure of the grammar for explanations of these differences.

2. The Adjacency Condition on Case Assignment

2.1 Let us first deal with the fact that NP objects must appear adjacent to a governing verb or preposition, abstracting away from the phenomenon of Focus NP Shift constructions, and concentrating on the contrast with objects of [+N] heads, exemplified again in (13) (cf. 6, 10):

- (13) a. The notoriety resulting from [Kathy's exposure in the Washington Post [of Nixon's war crimes]] led to her new assignment
 b. *The notoriety resulting from [Kathy's exposing in the Washington Post [Nixon's war crimes]] led to her new assignment.

As noted previously, gerunds and derived nominals are both factive, so the issue of Focus NP Shift is irrelevant. Rather, it seems that the difference stems from the fact that the objects of derived nominals are subject to the rule of *of*-Insertion, whereas verbs take bare NP objects.

To approach an explanation for this correlation, we must ask why it should be that nouns and adjectives (i.e. the [+N] heads) require that their objects be preceded by a preposition, while verbs and prepositions take bare NP objects. A plausible answer to this question comes from the theory of abstract Case, developed by J.R. Vergnaud and elaborated upon by Chomsky (1980), Rouveret and Vergnaud (1980), and others.

According to this theory, only [-N] heads can assign Case to an object. It is further assumed that all noun phrases must be assigned Case; this is captured formally in Chomsky (1980) by means of a filter which rejects any noun that is not marked for Case:

(14) The Case Filter:

*N, where N has no Case.

Case that is assigned to NP is realized morphologically on the head, so (14) ensures that NP will appear only in a position of Case assignment.³

In Chomsky (1981), the Case filter is integrated more closely with the theory of thematic role assignment, by means of adopting a version of Aoun's (1979) "visibility" hypothesis. Specifically, Chomsky proposes a condition on θ -role assignment, restated here in a simplified form as (15):⁴

(15) θ -roles may only be assigned to A-positions which are associated with PRO or Case.

The term "associated with" is left deliberately vague in (15); it will be formalized with greater precision in Section 3.3. For present purposes, any position that is occupied at S-structure by PRO or Case-marked NP satisfies (15).⁵ The assignment of θ -roles is also conditioned by the θ -criterion, which constitutes the fundamental core of the theory of thematic roles.

This is stated informally as (16):

- (16) a. Each θ -role is associated with exactly one argument.
 b. Each argument is associated with exactly one θ -role.

The θ -criterion is a generalization of the conditions of "functional uniqueness" and "functional relatedness" proposed by Freidin (1978).⁶ Given (15), the Case Filter (14) follows from the θ -criterion -- at least for NP arguments -- since lexical NP must bear Case in order to be assigned a θ -role.⁷

Let us now return to the status of NP objects with respect to Case theory. Each subcategorized object is assigned a θ -role by the governing head, regardless of whether the head is a verb or derived nominal. Verbs can assign Case to their objects, thereby making θ -role assignment possible, satisfying (15) and (16). But derived nominals lack the Case-assigning feature [-N]; therefore they can only assign a θ -role to a noun phrase that is assigned Case by some other means; this is why *of*-Insertion is required. Since *of* is a preposition, it bears the feature [-N], and can function as a "dummy" Case-marker. This allows the NP to which it is adjoined to satisfy (15), making θ -role assignment possible, as required by (16).⁸

2.2 We are now in a position to approach the issue of adjacency, which appears to apply only to objects that are directly Case-marked by a governing verb. Specifically, we can adopt Chomsky's (1980) proposal that Case assignment observes a strict condition of adjacency, at least for structures where Case is assigned under government. Suppose that we adopt the following definition of government:⁹

(17) Government

In the configuration $[\gamma \dots \beta \dots \alpha \dots \beta \dots]$, α governs β where

- i. $\alpha = X^0$, and $\gamma = X^1$ (i.e. γ is an X-bar projection of α), and
- ii. for each maximal projection δ , $\delta \neq \alpha^n$, if δ dominates β ,
 then δ also dominates α .

Then Case assignment applies in a subset of domains of government:¹⁰

(18) Case Assignment under Government

In the configuration $[\alpha \ \beta \ \dots]$ or $[\dots \ \beta \ \alpha]$, α Case-marks β , where

- (i) α governs β and
- (ii) α is adjacent to β , and
- (iii) α is $[-N]$

The fact that an object NP must appear adjacent to a governing verb now follows from the interaction of the θ -criterion (16) and the condition on θ -role assignment (15) with the adjacency condition on Case-assignment (18ii). The fact that an NP object in \bar{P} must appear adjacent to the governing P follows in a parallel fashion.¹¹

We can now account for the fact that NP objects in \bar{N} need not necessarily appear immediately after the head by assuming that the rule of *of*-Insertion is not subject to any adjacency condition. The dummy Case-marker *of* is itself adjacent to the NP to which it assigns Case, satisfying (18ii). Since there is no adjacency condition on θ -role assignment, the head noun can assign a θ -role to an *of*-NP object, even when a PP intervenes, as in (10).¹²

2.3 It seems that the exact instantiation of the adjacency condition varies somewhat from one language to the next. In English, the condition is interpreted quite strictly, so that even an intervening manner adverbial is sufficient to block it:

- (19) a. Paul quickly opened [the door]
 Jenny quietly read [her book]
 b. Paul opened [the door] quickly
 Jenny read [her book] quietly
 c. *Paul opened quickly [the door]
 *Jenny read quietly [her book]

In Italian, however, the sentences corresponding to (19) are grammatical:¹³

- (20) a. Mario ha letto attentamente un libro
 Mario has read attentively a book
 'Mario read a book attentively'
- b. Mario legge spesso dei libri
 Mario reads often books
 'Mario often reads books'

In other respects, however, Italian behaves just like English with respect to verb-object adjacency. (Here we must disregard Focus NP Shift constructions, which can be identified by a stylistically-marked intonation pattern.¹⁴) Time and place adverbials may never intervene between a verb and its object:¹⁵

- (21) a. *Mario ha letto ieri un libro
 Mario has read yesterday a book
 'Mario read a book yesterday'
- b. *Luigi legge in casa dei libri
 Luigi reads at home books
 'Luigi reads books at home'

Nor may an indirect object intervene:

- (22) a. ho dato (rapidamente) dieci dollari a Paulo
 I have given (quickly) ten dollars to Paulo
 'I (quickly) gave Paulo ten dollars'
- b. #*ho dato a Paulo dieci dollari
 I have given to Paulo ten dollars
 'I have given to Paulo ten dollars'

Thus Italian observes condition (18ii) for the most part, as we expect.

How, then should we account for the class of apparent violations in (20)?

It may be correct to view the manner adverbials as being "invisible" for the purposes of Case assignment. Specifically, we might hypothesize

that Case-assignment in Italian applies to an abstract representation of

\bar{X} , where only the head and its arguments appear.¹⁶ Such a representation

is a projection, in the sense of Vergnaud (1977). English and Italian

would then differ according to whether Case assignment applies on the

Argument-Projection. The English strategy is presumably the unmarked

option, from the perspective of markedness theory, since it would require

negative evidence to inform the English child that Case cannot be assigned on the argument projection.

There is independent evidence that Italian grammar makes reference to an Argument-Projection of this sort. Rizzi (1978a) motivates a restructuring rule which optionally reanalyzes a terminal substring $[V_1 (P) V_2]$ as a single verbal complex, where V_1 belongs to a particular lexical class.¹⁷ A consequence of the application of this rule is that a clitic which precedes the governing verb V_1 can be linked to an A-position within the complement of V_2 .¹⁸ This phenomenon of "clitic climbing" serves as a diagnostic for Restructuring:

- (23) a. Mario *la* - [finira - di - leggere] - domani
 Mario *it* will finish - [of] - to read tomorrow
 'Mario will finish reading it tomorrow'
- b. Piero *li* -- [andò - a - chiamare] - alla stazione
 Piero *them* went - [to] - to call at the station
 'Piero went to call them at the station'

Normally, restructuring only applies to a string of adjacent constituents, but the same class of manner adverbials which appear to be invisible for the purposes of Case assignment also have no effect on Restructuring (cf. 23):

- (24) a. Mario *la* - [finira - immediatamente - di - leggere] - domani
 'Mario will immediately finish reading it tomorrow'
- b. Piero *li* - [andò - subito - a - chiamare] - alla stazione
 'Piero went right away to call them at the station'

We can account for (24) straightforwardly, by assuming that the Italian Restructuring rule also applies on the Argument-Projection, where manner adverbials do not appear.¹⁹

A similar conclusion can be drawn from Longobardi's (1979) Double-Infinitive Filter (DIF):

(25) Double-Infinitive Filter (DIF):

*Vinf-1 - Vinf-2

where Vinf-1 c-commands Vinf-2, but Vinf-2 does not c-command Vinf-1.

Normally, the DIF only applies to two adjacent infinitives; even WH-trace blocks its application. However, Longobardi observes that the same manner adverbials which fail to block Restructuring also have no effect on the DIF:

- (26) a. *Si dovrebbe preferire sempre imboccare la retta via
 One should prefer always to take the right way
 * (inf-1) - (inf-2)
- b. *Giorgio vorrebbe osare arditamente passare all'azione
 Giorgio would like to dare bravely to go into action
 * (inf-1) - (inf-2)

Clearly a solution in terms of the argument-projection is appropriate here as well, as Longobardi himself suggests.

Thus there is considerable evidence supporting the hypothesis that certain rules of Italian syntax apply to an abstract projection of a head and its arguments. Given such an approach, the apparent violations of the adjacency condition cease to pose any serious problem and (18ii) can be maintained in the strongest possible form -- as an invariant principle of universal grammar.

2.4 A different kind of counterexample to the adjacency condition arises in Dutch.²⁰ It turns out that a wide variety of constituents may intervene between a verb and its object, including particles, prepositional phrases, and predicative adjective phrases; the following illustrative examples are drawn from Koster (1978b):

- (27) a. [dat Peter [John] naar Amsterdam stuurt]
 that Peter John to Amsterdam sends
 'that Peter sends John to Amsterdam'

- b. [dat John [Peter] ziek maakte]
that John Peter sick makes
'that John make Peter sick'
- c. [dat John [Peter] naar Amsterdam weg promoveerde]
that John Peter to Amsterdam away promoted
'that John promoted Peter away to Amsterdam'

The situation in Dutch is particularly striking in that the non-adjacency of verb and object can't simply be treated as a "scrambling" phenomenon. In fact, the order of complements in Dutch is comparatively strict. It is not just that the object is allowed to appear at the beginning of VP; it actually must appear there, unless it is topicalized. Moreover, the elements which intervene between verb and object in (27) are not simply manner adverbials, as in Italian, but are -- in a sense -- arguments of the verb. The order of Dutch complements is, *prima facie*, precisely the opposite of what the adjacency condition on Case assignment would predict.

Recall, however, that Dutch -- like German -- is a "verb-second" language. In main clauses, the verb often appears at the beginning of VP, rather than at the end of VP, as is true in subordinate clauses. Now in a sense the phenomenon of fixed complement order in a language where the verb alternates back and forth between the beginning and the end of VP would appear to be incompatible in principle with the adjacency condition. If it were the case that the verb always appeared at the beginning of VP, then the object NP would be just where the adjacency predicts: before all other complements, immediately after the verb.

In Chapter 2, I suggested that we might account for the phenomenon of "verb-second" by appealing to a notion of double-headed X-bar structure. Specifically, I proposed that languages such as Dutch and German utilize both options provided by UG for the placement of the head in \bar{X} , and the verb is liable to show up in either position, perhaps conditioned by prin-

ciples relating to government, as suggested by Safir (1981).

We might now recast the notion of a "double-headed" VP in the following terms. Suppose that in Dutch, the main verb is bound together with its auxiliaries to form a single complex word. Thus we might think of the auxiliaries as being added to the verb by a rule of word-formation. Although each verb within the complex may be interpreted as a distinct phonological word, it is not unreasonable to suppose that the rules of syntax and phonology could diverge at certain points in terms of how they analyze a phrase into words. This kind of distinction between phonological and syntactic words is probably required independently for constructions involving restructuring and reanalysis. Moreover, it is natural for auxiliaries to behave in this way, since many languages have no auxiliary system at all, and use morphological affixes instead.²¹ Hence, "auxiliary" languages, such as Dutch, French, and English may differ from "affix" languages such as Japanese and Sanskrit only insofar as their aspectual and tense markers are added by rules of word-formation, rather than by rules of morphology. In each case, the verbal complex would function as a syntactic unit.²²

In languages like French and English, this verbal complex will normally form a contiguous string. But in Dutch, this interacts with the double-headed \bar{X} -structure, so that the complex verb is actually discontinuous, and simultaneously occupies the \bar{V} -initial head position and the \bar{V} -final head position as in (28):

(28) a. Ik [\bar{V} [V heb] deze plaat [V gekocht]]

I have this record bought
'I have bought this record'

b. Hij [\bar{V} [V is] net eronder door [V gekomen]]

He is just there under through come
'He has just passed under it'

Now suppose that the verb "spreads" over both positions even when no auxiliary is actually present. Then regardless of which position the verb appears in phonologically, it can be interpreted as being present in both head positions, from the perspective of other rules of grammar:

- (29) a. Hij [\bar{V} [V loopt] naar het station [V --]]
 He walks to the station
- b. [omdat hij [[V --] naar het station [V loopt]]]
 because
 'because he walks to the station'

Now it is well known that in the Romance languages, the entire verbal complex functions as a unit with respect to clitic placement, since clitics are often attached to an auxiliary rather than to the main verb:

- (30) a. Paul le-lui-avait recommandé (French)
 Paul it him had recommended
 'Paul had recommended it to him'
- b. L'-ho regolato a Giovanni (Italian)
 it have given to Giovanni
 'I have given it to Giovanni'
- c. La -he estado mirando (Spanish)
 her have been looking-at
 'I have been looking at her'

Aoun (1979) and Borer (1981) argue that clitics are "absorbed" Case features. Then the fact that the entire verbal complex functions as a unit for clitic placement suggests that it functions as a unit for Case assignment as well.

Suppose that this is correct. In languages such as French, where the auxiliary appears on the opposite side of the verb from its object, this would have no empirical effect. But in Dutch, the result would be quite striking, since the verbal complex is discontinuous, occupying both head positions in \bar{V} . If the entire verbal complex functions as a unit for Case assignment, then it ought to be possible for the verbal complex to

Second, although certain adverbials may intervene between the verb and its object, this is not possible between a verb and an "unstressed pronoun":

- (35) a. Iemand las (waarschijnlijk) een boek
 Someone read (probably) a book
 'Someone (probably) read a book'
 b. Iemand las - 't
 Someone read it
 c. *Iemand las waarschijnlijk 't

Thus although Case assignment applies on the Argument Projection, as in Italian, this is not true of rules which adjoin clitics to verbs, which are presumably rules of word-formation. Finally, unstressed pronouns -- unlike other NPs -- may never topicalize, as noted by Koster (1978b). In all these respects, the unstressed pronouns behave like normal clitics. In fact, this is just what we should expect if the base component is not permitted to formulate rules like (32), which explicitly reserve phrase-structure positions for pronouns of a specific type. Rather, we should expect X-bar theory to specify the head position(s), while only rules of morphology and word-formation may stipulate facts of arbitrary constituent order for affixation and compounding.²⁴

Significantly, these unstressed pronouns cliticize to "second position", even when this position is phonologically empty, and the verb itself occupies the \bar{V} -final position:

- (36) a. [dat iemand [--] - 'm een boek [gaf]]
 that someone him a book gave
 'that someone gave him a book'
 b. *[dat iemand [--] een boek [gaf] - 'm]
 c. *[dat iemand [--] een boek - 'm [gaf]]

Cliticization to "second position" now makes sense: syntactically, the clitics are adjoined to the \bar{V} -initial head position, which is part of the

verbal complex. Phonetically, however, the clitics adjoin to the subject NP which precedes this phonologically-null head V, again supporting the view that a phonological word is not always equivalent to a syntactic word. Thus cliticization phenomena provide independent evidence for the claim that the verbal complex in "verb-second" languages such as Dutch and German actually forms a discontinuous unit spread over the two head positions allowed by X-bar theory. In these terms, the superficial violations of the adjacency condition on Case assignment in (27) are non-problematic. Moreover, it seems that the double-headed \bar{X} structure that was motivated to account for these apparent adjacency violations also provides an unexpected explanation for the otherwise mysterious phenomenon of cliticization to "Wackernagel's position" in the "verb-second" languages.²⁵

2.5 Before leaving the subject of the universality of the adjacency condition on Case assignment, it is perhaps worth mentioning that the free constituent order which appears in non-configurational languages is not problematic for this theory. It has often been observed that "free word order" seems to correlate with rich Case morphology. Typically, this is accounted for in functional terms: it is often pointed out that languages which have the means of expressing notions such as "subject" and "object" by means of Case-marking do not need to express these relations in terms of word order. Therefore -- so the argument goes -- word order in these languages is free.

But this style of explanation, although intuitively correct, actually misses the point. Consider, for instance, the fact that English has personal pronouns which provide a morphological reflection of the distinction between nominative and objective abstract Case. The functional

account of free word order -- if it is taken seriously as a scientific theory -- should predict that these pronouns can be "scrambled" more readily than other NPs, which do not encode Case morphologically. But this is simply false: English personal pronouns appear in the same structural positions as other noun phrases; if anything, their distribution is more restricted rather than less so. The point here is that the functional explanation for free word order is too crude to be able to do anything other than express a generalization which seems to hold across languages -- sometimes.

Despite these objections, the functional account does manage to make sense of what is certainly a significant correlation between extensive Case-marking and free constituent order. It is therefore worth asking whether the theory of abstract Case has anything to offer in its stead. In fact, the formal conditions on Case assignment in (18) offer such a possibility. Suppose that a given language has a morphological system with a large set of distinct Cases, such as Sanskrit's collection of nominative, accusative, dative, ablative, instrumental, locative, and genitive. Now when some combination of these Cases appears in a group of two or more subcategorized NPs, the verb cannot be responsible for assigning all these Cases without violating (18ii). It is natural, then, to assume that in these languages, Case is not assigned by the verb as in a configurational language. Rather, the verb must subcategorize for nominal complements which are intrinsically marked for specific Cases, just as an English verb may subcategorize for a PP complement of a particular type even though it does not assign Case to such complements.

It is significant that prepositions and postpositions behave rather differently from verbs in non-configurational languages. These "minor

categories", which almost invariably select a single complement with a specific Case, do not run into the problem encountered by verbs which take several Case-marked complements. This explains why condition (18ii) is invariably observed by prepositions and postpositions, which are always adjacent to the NPs to which they assign Case.²⁶ Therefore even non-configurational languages, which appear at first glance to display blatant violations of (18ii), turn out to observe the condition -- when it is relevant.

It is interesting to observe that this explanation for the general correlation between rich morphological Case systems and free constituent order is in a sense the converse of the standard story. This theory does not say that languages like English need fixed word order because they lack a rich Case system; instead, it claims that it is languages such as Sanskrit which "need" free word order, in the sense that free constituent order in VP is a necessary consequence of Case being subcategorized for by the verb, rather than being assigned by it.

This account of free constituent order is, of course, somewhat speculative, and no doubt many specific problems will arise in any serious attempt to provide a complete account of the order of constituents in any given language. Moreover, as Ken Hale has observed (personal communication), it is probably wrong to assume that there is a rigid dichotomy between configurational languages on the one hand and non-configurational languages on the other. Within the framework of Case theory and X-bar theory, languages could be non-configurational in many different ways.

For instance, as we suggested in Chapter 2, it may be that some languages may have an impoverished representation of X-bar structure. If a language did not represent the distinction between \bar{X} and $\bar{\bar{X}}$ at

S-structure, then a flat, multiple-branching \bar{X} level will result. Farmer (1980) argues that Japanese phrase structure is of this type.

Other languages might maintain the distinction between \bar{X} and $\bar{\bar{X}}$ at S-structure while still having a rich Case system, thereby allowing verbs to subcategorize for complements with a variety of intrinsic Cases. In such a language, there might be fixed subject position, but constituent order within VP would be more or less free. German may be an example of this type: although it behaves like Dutch with respect to a double-headed \bar{V} , it has a richer Case system and a corresponding freedom of constituent order in VP.

Still another type of semi-non-configurational language might maintain a rich Case system, but continue to have objective Case assigned under adjacency by a governing verb. In such a language, the direct object would have to be adjacent to the verb -- at least on the argument projection. But other complements with intrinsic Case marking would be freely ordered with respect to each other within each bar-level just as PP arguments in English are freely ordered in \bar{V} :

- (37) a. Jim spoke [to Janice] [about Paul]
 Jim spoke [about Paul] [to Janice]
 b. Kevin rode [on the train] [to Oakville]
 Kevin rode [to Oakville] [on the train]

Thus it seems that a formal theory of grammar which includes the subtheories of X-bar phrase structure and abstract Case assignment can lead to an interesting cross-linguistic typology of various kinds of non-configurational phenomena.

3. The Mapping from D-Structure to S-Structure

In the preceding section we have examined structures in which an NP argument appears at D-structure in a position where Case is assigned at S-structure. Such a position is normally adjacent to a governing head bearing the Case-assigning feature [-N]. In such structures, Case assignment and θ -role assignment are both straightforward. Since the NP is assigned Case at S-structure, it is eligible to be assigned a θ -role, in conformance with condition (15).

In this section, we turn our attention to structures in which an NP argument appears at D-structure in a position which is not adjacent to a [-N] head. In such structures, some rule other than Case assignment must apply, if the θ -criterion is to be satisfied. In one class of structures, a dummy preposition is inserted to assign Case to NP, as required by (15). In another class of structures, the rule *Move α* applies, permitting a single NP to be associated with two or more A-positions. We will consider each of these in turn.

3.1. Dummy Case-Markers

3.1.1. We have seen that the object of a derived nominal need not appear adjacent to the governing head; cf. (10) vs. (6). The same is true for the object of an adjective:

- (38) a. Anyone who is [fearful - beyond reason - of traffic lights]
should not be allowed to drive
b. Sarah is [considerate - in every respect - of her neighbors'
wishes]

Although these objects must bear Case in order to head an A-chain to which the object θ -role is assigned, they are not assigned Case directly by the governing [+N] head. Rather, the dummy preposition *of* assigns Case

to these NPs. For this reason, the adjacency condition holds between the object and its dummy Case-marker, rather than between the object and the governing verb. Therefore the derived *of*-NP may appear after other complements of the head.

Just as the Case-assignment rule (18) is essentially invariant across languages in its formulation, the same appears to be true for the rule inserting the dummy Case-marker in NP and AP. Of course, the dummy preposition which is inserted by this rule has a distinct phonological form in each language; what appears as *of* in English shows up as *de* in French, *di* in Italian, and *Šel* in Hebrew, to mention just a few examples. But at a more abstract level, the formal properties of the rule are essentially constant cross-linguistically. Specifically, the rule applies in the structural environment defined in (39):

(39) *of*-Insertion

In the environment [α ... β ...], adjoin *of* to β , where

- i. α is some projection of [+N]. and
- ii. β is an immediate constituent of α , and
- iii. for some γ , γ the head of α , γ precedes β .

As formulated in (39), the rule applies to an NP which is directly dominated by some projection of A or N, and which is preceded by the governing head. Crucially, however, (39) does not require adjacency between the [+N] head and the object to which the dummy Case marker is adjoined.

If a language has no dummy prepositions corresponding to English *of*, it will often make use of a distinct rule of genitive Case assignment, which has a partially overlapping domain of application. In some languages -- such as English -- both rules are used, but they keep their domains of application distinct, so that genitive Case is only assigned in pre-head

position. (A more extensive discussion of the formal properties of these rules is provided in the Appendix to this chapter.)

3.1.2 As we observed in footnote 12, the existence of dummy prepositions raises an interesting issue with respect to the categorial status of α in (40):

- (40) a. [the destruction [α of [_{NP} the city]]]
 b. [considerate [α of [_{NP} other people]]]

Recall that the "Remarks" theory of the lexicon predicts that *destruction* and *considerate* subcategorize for NP complements, since they are included in the lexical entries for *destroy* and *consider*, which are both transitive. Now the Projection Principle requires that if a head H selects a complement C as a lexical property at some grammatical level (D-structure, S-structure or LF), then it must also select it at other grammatical levels. Clearly, strict subcategorization must involve selection at some grammatical level, whatever that level may be. So if *destruction* and *considerate* subcategorize for NP, they must select NP at S-structure; therefore $\alpha = \text{NP}$ in (40).

But this conclusion conflicts with the hypothesis that dummy prepositions such as *of* assign Case under government, which is supported by the fact that this Case-marker immediately precedes its object, as required by (181i). Now by (171), *of* must be the head of α in (40); but *of* is a preposition, so α must be PP. Thus the conclusion following from the theory of strict subcategorization and the Projection Principle is contradicted by the principles of Case assignment in this domain.

We can resolve this contradiction by slightly revising the relationship between strict subcategorization and the Projection Principle. Suppose that the strict subcategorization requirements of a lexical head

must always be satisfied at D-structure. In this sense, D-structure is a "projection" of lexical structure, as suggested by Chomsky (to appear). Now if $\alpha = \text{PP}$ in (40), then *of*-Insertion must apply after the level of D-structure, if strict subcategorization is to be satisfied. Then (39) must derive the S-structure (41b) from the D-structure (41a):

- (41) a. [N [_{NP}]]
 b. [N [_{PP} of - NP]]

Suppose now that the Projection Principle is insensitive to categorial distinctions between phrases. Then even though the strict subcategorization features of N would require an NP complement at D-structure, the Projection Principle would only require that some phrase XP appear as the complement of N at S-structure; PP would therefore be sufficient in (41b). Chomsky (1981) suggests that S-structure may be "factored" into two terms: D-structure and *Move- α* , where D-structure is a pure representation of the grammatical functions of the θ -positions and their heads (GF- θ). Perhaps, following the derivation (41), D-structure is also a representation where the effects of rules such as (39) have been factored out.²⁷ In these terms, D-structure emerges as a pure representation of strict subcategorization requirements as well. Then just as trace satisfies the Projection Principle at S-structure, where *Move- α* applies, so PP satisfies it in (41b), after (39) applies.²⁸

There are other possible solutions as well. Morris Halle has suggested that the dummy preposition may really correspond to a Case-affix, which is assigned structurally, so that α in (40) would be NP. On the other hand, Chomsky (1981) suggests that α may be a neutralized category which is unspecified for [\pm N]. Each of these proposals has

interesting consequences which we will not pursue further here.

3.2 Move α

3.2.1 We can now turn our attention to those structures in which an NP argument appears at D-structure in a position which is subject to neither Case assignment nor Dummy Case-marker insertion at S-structure. We will draw extensively on Chomsky's (1981) account of these phenomena, differing only on specific minor points of interpretation. Our discussion is intended primarily to show how the subtheories of Case and θ -role assignment introduced above interact with other components of "Government-Binding" theory to derive a number of well-known properties of passive, raising, and control structures. This section also serves as a necessary preliminary to the account of \bar{S} complementation to be developed in later sections of this chapter.

Let us consider first the distribution of PRO, the null pronominal element which is subject to control and which directly satisfies Condition (15). The appearance of PRO is crucially limited by the Binding Theory proposed by Chomsky (1981):²⁹

(42) Binding Theory

- a. An anaphor is bound in its governing category
- b. A pronominal is free in its governing category
- c. An R-expression is free

The binding theory in (42) applies to arguments appearing in A-positions; thus α is bound in (42) if it is co-indexed with a c-commanding A-position; it is free otherwise. Anaphors are arguments with no inherent reference; pronominals are arguments whose lexical content consists solely of grammatical features (person, number, gender, Case, etc.); R-expressions are

arguments other than clauses which have "potential reference", including names and variables. According to these definitions, PRO is both a pronominal and an anaphor. Therefore by (42) it must be simultaneously bound and free in its governing category. Since this is impossible, it can have no governing category; therefore PRO can never appear in a governed position at whatever level (42) is applicable. The available evidence suggests that the relevant level is S-structure.³⁰ Thus PRO may not appear within the projection of a lexical category, by the definition of government in (17): -

- (43) a. *John [_{VP} saw PRO]
 b. *There was [_{[+V]P} shot PRO]
 c. * [_{NP} PRO killing of the geese] shocked me

Nor may PRO appear in the subject position of S, if this position is governed either by the [+Tense] feature, which assigns nominative Case, or by the [-N] feature of the infinitival complementizer for, which assigns objective.³¹ This is illustrated in (44) vs. (45):

- (44) a. They fought fiercely
 b. [For him to win] would be dangerous
 (45) a. *PRO fought fiercely
 b. *[For PRO to win] would be dangerous

In fact, the only A-position in which PRO can appear at S-structure is in the subject position of a non-tensed S with no governing complementizer:³²

- (46) a. I asked Neil [_S PRO to pass the matches]
 b. [_S PRO to walk home alone] is dangerous

(46a) is a control structure, while PRO has arbitrary reference in (46b).

In (46), PRO is ungoverned, so the Binding Theory is satisfied. Since Condition (15) permits a θ -role to be assigned to an A-position that is occupied by PRO, θ -role assignment is possible, and the θ -criterion is satisfied.

3.2.2 Consider now what happens when an NP argument appears at D-structure in a governed position that is subject to neither Case assignment nor dummy Case-marker insertion. We will consider two examples of this, involving passive participles and Raising verbs, represented in (47a) and (47b):

- (47) a. ... [$\overline{[+V]}$] [+V] - NP_i ...
 b. ... [\bar{V} V_R [_S NP_i ...

In each structure, take NP_i to be a θ -position. The θ -criterion requires that the θ -role that is assigned to NP_i must be associated with an argument. But (15) requires that the θ -position be associated with either PRO or Case. Neither the Raising verb nor the passive participle assigns Case, so NP_i is not associated with Case. Moreover, in each structure, NP_i is governed by the verb or participle, so PRO can't appear there because of the Binding Theory. Hence (15) is not satisfied, and θ -role assignment should be blocked.

But there are grammatical S-structure configurations corresponding to the D-structures in (47), i.e. those of (48):

- (48) a. [John]_i was distrusted [e]_i
 b. [Carol]_i appears [_S [e]_i to fear guns]
 c. [_S PRO_i to be distrusted [e]_i by everyone] is depressing
 d. It is unwise [_S PRO_i to appear [_S [e]_i to fear guns]]

In these structures, the position occupied by the trace [e]_i corresponds to NP_i in (47). In (48a,b), NP_i is bound by the main clause subject position, which is occupied by a lexical NP to which Case is assigned. In (48c,d),

NP_i is bound by the ungoverned subject position of the infinitival clause; this position is occupied by PRO, in conformance to the Binding Theory. Evidently, the antecedent-trace relation in (48) is sufficient for NP_i to be "associated with" the features of Case or PRO. We can now formalize the notion of "association" in terms of (49):

(49) Argument Association (A-association)

An R-position P is A-associated with an argument A, where

- i. A occupies P, or
- ii. for some position P', A occupies P', and P' is co-indexed with P, by virtue of *Move α* .

Let us assume that if P is A-associated with A, then P is A-associated with all of the features of A, by convention. Then NP_i is A-associated with PRO in (48c,d), and with the nominative Case features of the lexical NP subject in (48a,b). We can now interpret (15) and (16) in terms of A-association. This means that the θ -role assigned to NP_i in (48) can be A-associated with the argument in the antecedent A-position, satisfying (15) and (16a). Similarly, the argument is A-associated with NP_i , and by convention is A-associated with the θ -role assigned to NP_i , satisfying (16b).

When two or more A-positions are A-associated with a single argument, they form a sequence of the form $[P_1, \dots P_n]$, such that each position P_i c-commands position P_{i+1} . Moreover, by virtue of the bounding condition on *Move α* , each position P_i is subjacent to any position P_{i-1} . In addition, if P_i is an empty category, i.e. trace, as is true for NP_i in (48), then it must satisfy the Empty Category Principle, proposed by Chomsky (1981):

The Empty Category Principle (ECP)

[e] must be properly governed.

Proper government is a subcase of government as defined in (17); we will

provide a more precise definition of this term in Chapter 6, in the context of a detailed study of the ECP.

Now by virtue of the biuniqueness conditions of the θ -criterion, each sequence of A-positions that are A-associated with a given argument may not be A-associated with any other argument, and just one of the positions in the sequence will be a position to which a θ -role is assigned. Thus each sequence functions as a unit with respect to the principles of the theory of θ -roles. Chomsky (1981) proposes to capture this observation by means of the notion of a chain. In our terms, a chain is the set of R-positions with which an argument is A-associated. The set of A-positions in the chain is an A-chain. The A-position in the chain which c-commands all other A-positions in the chain is the head of the chain.³³ When an A-chain includes two or more A-positions, it will have all of the properties of the sequence [$P_1, \dots P_n$] mentioned above. In addition, if P_i in an A-chain is an empty category, it will also count as an anaphoric trace, and will be subject to Condition (a) of the Binding Theory (42).

The fact that each A-chain functions as a unit with respect to the assignment of θ -roles is captured by restating (15) as (15'):

- (15') θ -roles can only be assigned to A-chains that are headed by a position occupied by PRO or Case.

Effectively, (15') is equivalent to (15) in terms of empirical coverage. When the chain consists of a single position, this must be a θ -position that is occupied either by PRO or Case-marked NP. When the θ -position corresponds to NP_i in (47), then *Move α* must apply, so as to form an A-chain at S-structure consisting of at least two positions. The antecedent NPs in (48) c-command the other A-positions in the chain, so they count as the head positions of the chain. In each structure, (15') is satisfied: the head

position bears Case features in (48a,b) and is occupied by PRO in (48c,d). Note, incidentally, that chains are defined in terms of S-structure configurations of co-indexed R-positions. This means that their structure will reflect the application of *Move α* only insofar as this follows from trace theory; the rules forming chains at S-structure cannot actually "look back" in global fashion at the transformational derivation itself.

3.2.3 In some cases, *Move α* applies to an NP even though the NP appears at D-structure in an A-position where Case can be assigned at S-structure. There are three basic examples of this. The first involves NP-internal application of *Move α* . Recall that the rules of *of*-Insertion and genitive Case assignment both apply within NP; each of these rules is optional. Suppose that an NP appears as the object of a derived nominal at D-structure, as in (41a). Then there are two ways for Condition (15') to be satisfied at S-structure. First, *of*-Insertion can apply, yielding the structure (41b), exemplified in (50a). Alternatively, *Move α* can apply, taking the NP to the prenominal position where genitive Case is assigned at S-structure:

- (50) a. [the destruction of-[the city]]
 b. [[the city's]_i destruction [e]_i]
 c. *[[the city's]_i destruction of-[e]_i]

In both (50a) and (50b), (15') is satisfied, allowing θ -role assignment to proceed. It is likely that the ungrammaticality of (50c) follows from an ECP violation, although some version of "Case clash" may be involved. We will consider this phenomenon in a later section.

The second example of movement away from a Case-marked A-position involves movement to a non-A-position, as in structures involving WH-movement or Topicalization:

- (51) a. I wonder [which house]_i Brian bought [e]_i from the broker
 b. This is the house [which]_i Brian bought [e]_i from the broker
 c. [This house]_i, I doubt that Brian would have bought [e]_i from anyone

In these structures, the trace left in the A-position at S-structure is assigned Case under (18). It therefore heads an A-chain at S-structure to which the object θ -role can be assigned. The NP_i appearing in COMP or Topic position -- if these are distinct -- binds its trace, just as an operator binds a variable at the level of Logical Form. It is plausible that the language faculty has formalized the logical notion of the operator-variable relation in the form of the structural relation holding between a non-A-position and an A-position which it binds. Perhaps it is this particular formalization which has permitted the extension of the operator-variable relation to Topic constructions, even though there is no obvious logical sense in which the topicalized constituent is an "operator".³⁴

Since NP_i in (51) appears in a non-A-position it is not itself assigned a θ -role, so it need not be assigned Case. Rather, it is the trace (i.e. the variable) which functions as the argument within the A-chain with which the θ -role is associated, in accordance with the θ -criterion. Note that since the variable heads the chain and bears Case, it must appear adjacent to the governing Case-assigner at S-structure, by virtue of (18ii). Therefore NP_i must appear in the same position adjacent to the governor at D-structure, if Move- α is limited to substitutions and adjunctions.

Another instance of movement to a non-A-position is the Focus NP Shift constructions discussed in Section 1:

- (52) a. Kevin gave [e]_i to his mother [a new book]_i

- b. Brian brought $[e]_1$ — back to America — after the end of the war — [a priceless portrait of Napoleon]₁
- c. I heard $[e]_1$ — on the radio — on my way home from work — [the song that you told me about]₁

It has sometimes been suggested (e.g., by Rochemont, 1978) that this construction involves a stylistic rule, in the sense of Chomsky and Lasnik (1977). As Rochemont observes, this claim implies that the output structures produced by this rule should never be subject to application of *Move- α* . Similarly, Focus NP Shift should have no effect on Logical Form representations. But in fact, there is empirical evidence against both of these predictions; we shall discuss some of this evidence elsewhere in this thesis.³⁵

It is important to be very cautious in using the term "stylistic rule" in the context of a formal theory of grammar. While it is certainly true that Focus NP Shift is used for a marked stylistic effect, the same is true of the Topicalization construction, which has been shown to involve the core syntactic rule *Move- α* . Suppose that this is also true of Focus NP Shift, as suggested by the evidence that I have alluded to. Then the structures in (52) must be S-structure representations. The trace $[e]_1$ is in the Case-marked position adjacent to the verb, so it is eligible to head an A-chain and be assigned the object θ -role. In contrast, the postposed NP_1 appears after all other material in VP -- including the adverbial modifiers at the \bar{V} level in (52b,c). This suggests that NP_1 is in a non-A-position of some kind, acting as a c-commanding antecedent for the variable in object position. In a sense, the non-A-position at the end of VP makes this construction a kind of mirror-image of the Topicalization construction discussed previously.

The third example of movement out of a Case-marked position is the Postverbal Subject Constructions (PSC), which is typical of the so-called "Pro-Drop" languages, as observed by Rizzi (1980). In these languages, it seems that the PSC is to some extent analogous to the NP-internal movement in example (50a), in that nominative Case can be assigned directly either to preverbal or postverbal position.³⁶ But similar constructions also occur in English, despite the fact that nominative Case can only be assigned to the "true" (preverbal) subject position:

- (53) a. There walked into the room [_{NP} a man]_i
 b. There has occurred [_{NP} a terrible disaster]_i

Following the spirit of Chomsky's (1981) discussion of the PSC in Pro-Drop languages, we can assume that each of the postverbal subjects in (53) is part of an A-chain which also includes the pleonastic element *there*. Since *there* is assigned nominative Case, the A-chain which it heads satisfies condition (15), and θ -role assignment is possible. Note, however, that it is the postverbal NP_i which is the argument that must be associated with a θ -role, in conformance with the θ -criterion.

Now if these two positions form an A-chain, then the true subject position must c-command the postverbal subject at S-structure. Suppose that NP_i appears in the preverbal subject position at D-structure; suppose further that Move- α allows exactly two operations: (i) substitution and (ii) adjunction to a maximal projection. Then if *there* must bind NP_i at S-structure, it follows that NP_i must adjoin to VP, provided that c-command is defined as in (54):³⁷

(54) C-Command

In the configuration [... α ... β ...] α c-commands β , where

- i. α, β are maximal projections, and
- ii. the first branching node dominating α also dominates β .

If NP_i were to adjoin to S or \bar{S} , then it could not be part of a chain headed by the true subject position, by virtue of (54ii). Therefore NP_i must be adjoined to VP , as suggested by Kayne (1978) and others. This in turn implies that the VP -adjoined position can be interpreted as an A-position.³⁸

At this point, another problem arises. If NP_i in (53) is bound by the NP in subject position, then it violates condition (42c) of the binding theory, as noted by Rizzi (1980). Chomsky (1981) resolves this conflict between the binding theory and the definition of chains by introducing a second system of indexing, represented formally by superscript indices. He proposes that chains can be defined on either system of indexing, while the binding theory only looks at subscript indexing. (To be precise, each "link" in a chain must involve local BINDING, where "BINDING" is defined in terms of c-command and co-indexing on either stratum of indices.) Then the contradiction between the binding theory and the definition of chains is resolved, provided that NP_i in (53) is co-superscripted with the c-commanding true subject position. In fact, this is a natural proviso, if we assume that by convention, *Move- α* involves co-superscripting in the case of downward movement, just as it involves co-subscripting in the case of upward movement.

The derivation of (53) then proceeds as follows. At D-structure, NP_i appears in a ^{pre}~~post~~verbal position. *Move- α* applies, adjoining NP_i to VP , and co-superscripting NP_i with the empty category in subject position. The rule of *there*-Insertion adds phonetic content to the subject position at S-structure, but the superscript index left by *Move- α* remains, since

there has no inherent index. (*there*-Insertion also adds lexical content if *there* is an existential quantifier, as proposed by Milsark, 1974.) Presumably, true subject position is the θ -position, at least at the level of D-structure.³⁹

3.3 This concludes our discussion of the mapping between D-structure and S-structure, with respect to NP arguments. We have observed that D-structure can be conceived of as a pure representation of grammatical functions and strict subcategorization frames, which are projected from the lexicon (cf. Chomsky, to appear). On the other hand, S-structure is the level of representation where the subtheories of binding, abstract Case, and function-chains apply.

The mapping between these two levels is dependent upon the interaction of various subtheories of grammar, including the θ -criterion, the Projection Principle, and the theories of Case and government, among others. The basic principles of these theories have an invariant formal nature, predetermined by the language faculty. Nevertheless, there is some room for parametric variation at specific points in the formal structure of the theory, so that the grammars of individual languages will differ in various ways within the limits allowed by the language faculty.

Both D-structure and S-structure conform to the basic principles of phrase structure determined by the X-bar system and the definitions of A-positions and non-A-positions. The properties of structural configurations defined by these principles play an important role in almost every other component of Core Grammar. In particular, we have seen that the formulations of government (17), Case assignment (18), *of*-Insertion (39) and c-command (54) all make crucial use of notions of X-bar theory, while the theories of binding and function-chains make crucial reference

to the distinction between A-positions and non-A-positions.

Conspicuously absent from our discussion has been any reference to category-specific formulae stipulating the linear arrangement of constituents within any given level of X-bar structure. Typically, the arrangement of constituents at S-structure differs in complex ways from one structure to another, and from one language to the next. The purpose of the preceding discussion has been to provide an overview of a formal theory of grammar which is capable of deducing these superficially arbitrary differences from general principles, rather than simply stipulating them by means of structural generalizations expressed in terms of categorial rules.⁴⁰

In the following sections of this chapter, I will extend this theory so as to derive the distribution of categories other than NP in a similar fashion.

4. The Case-Resistance Principle

4.1 Recall the formulation of Case assignment in (18):

(18) Case Assignment under Government

In the configuration $[\alpha \ \beta \ \dots]$ or $[\dots \ \beta \ \alpha]$, α Case-marks β , where

- (i) α governs β and
- (ii) α is adjacent to β , and
- (iii) α is $[-N]$

(18) states that the Case-assigning element α must be $[-N]$, but it leaves the categorial status of β unspecified. In all of the structures considered so far, however, β has always been NP, which is $[+N, -V]$. The same is true of the other instances of Case assignment which we have discussed, including genitive Case assignment in NP and nominative Case assignment under government by the $[+tense]$ feature of the head of a finite

clause. One might ask, however, if β is always NP, or whether the other lexical categories may ever bear Case features.

Consider first AP, which is [+N, +V]. Although it is rare for APs to function as independent arguments in A-positions, it is common for them to be assigned Case in agreement with a head noun. This is illustrated by the following German paradigm.

(55) German adjectives: Strong Declension, Masculine

(sing.)	Nominative	guter Kaffee	"good coffee"
	Genitive	guten Kaffees	
	Dative	gutem Kaffee	
	Accusative	guten Kaffee	
(plur.)	Nominative	heubsche Geschenke	"nice presents"
	Genitive	heubscher Geschenke	
	Dative	heubschen Geschenke	
	Accusative	heubsche Geschenke	

Moreover, Case can be assigned directly to AP when it functions as an argument. For instance, Russian, like German, has agreement between adjectival modifiers and the head noun. But when AP is used predicatively, it is assigned instrumental Case:⁴¹

(56)	a.	Vrač ^Ÿ	kažetsja	bol'nym	
		doctor(NOM)	seems	sick(INST)	
		'The doctor seems sick'			
	b.	Ivan	sčitaet	Ma ^Ÿ su	krasivoj
		Ivan(NOM)	considers	Masha(ACC)	pretty(INST)
		'Ivan considers Masha pretty'			

So it seems that AP, like NP, can bear Case.

The same is not true, however, for the [-N] categories. VP is never assigned Case, although one might be inclined to attribute this to the fact that VP does not normally function as an argument.⁴² On the other

hand, PP often functions as an argument, especially when it denotes a specific direction or location. But no verb ever assigns Case to its PP complements. Recall that PP complements are freely ordered at each bar level, and need not appear adjacent to a governing verb. Moreover, PPs can appear as arguments of derived nominals and adjectives, which do not assign Case. Clearly, a PP argument need not be assigned Case.

In fact, there is quite a lot of evidence which suggests that PP must not be assigned Case. Specifically, PP may never appear at S-structure in a Case-marked position, even when it is a plausible argument. Two such positions are the subject position of a *for*-infinitive and the object position of a preposition which obligatorily assigns Case:

- (57) a. It would be nice [for [the counter-top] to have a nice paint job]
 b. We talked [about [the direction of the wind]]
- (58) a. *It would be nice [for [on the counter-top] to have a nice paint job]
 b. *We talked [about [from the west]]

Moreover, morphologically overt genitive Case is never assigned to PP:

- (59) a. I protested [[the park's] having been chosen for the rally]
 b. *I protested [[in the park's] having been chosen for the rally]

Finally, *of*-Insertion never applies "blindly" so as to Case-mark a PP complement:

- (60) a. John shot (at) the deer
 b. Paul played (with) dice
- (61) a. [John's shooting of (*at) the deer]
 b. [the playing of (*with) dice]

Of course, one can easily imagine ways to prevent PP from appearing in these structures, but this would miss the point that no rule of grammar ever assigns Case to PP.⁴³

Suppose that this is correct. Given the close connection between Case assignment and θ -role assignment imposed by Condition (15'), this leads to the question of how a PP is assigned a θ -role when it appears as a complement in structures such as (62):

- (62) a. Carol [put - the book - in her purse]
 b. The salami [was cut - with a knife]
 c. Jim [wandered - into the room]

Presumably, PP complements do not need to be assigned Case because they are immune to the effects of Condition (15') for some reason. But why should this be so?

Hagit Borer has suggested (personal communication) that perhaps θ -roles are not really assigned to the PPs in structures such as (62). Instead, the relevant θ -role may actually be assigned to the object of the preposition. Presumably, the θ -role would be derived compositionally, combining the meaning of the preposition with the appropriate "Direction" or "Location" θ -role of the verb, participle, or whatever. If we were to adopt this idea, then we would have an immediate solution to the problem raised above. Since a preposition assigns Case to its object, θ -role assignment to a PP complement would be directly analogous to θ -role assignment to the object of a dummy Case-marker, differing only insofar as a "true" preposition contributes to the meaning of the complex θ -role assigned to its object.⁴⁴ Alternatively, we might assume that the [-N] feature in the prepositional matrix itself counts as a Case feature for

the purposes of satisfying Condition (15'). Then Case could be assigned directly to the PP in (62).

It seems that a θ -role may only be assigned to PPs in this way when they appear as complements of a governing head. Thus θ -role assignment is not possible when a PP appears in the subject position of the infinitival complement to a Raising verb:

- (63) a. *It seems [_S [in the room] to be very cold]
 b. *It appears [_S [down in the mine shaft] to have scared Bill]

Thus the intrinsic "visibility" of the PP is sufficient for θ -role assignment to proceed when it appears as a complement, but not when it appears as a subject.⁴⁵ We might attribute this to the fact that a θ -role can only be derived compositionally within \bar{X} , perhaps by means of some kind of thematic restructuring akin to that proposed by Zubizarreta (1980). Under the alternative assumption that it is the [-N] feature of PPs which enables them to intrinsically satisfy Condition (15'), we might stipulate that the feature is only visible for the purposes of sanctioning θ -role assignment if it is linked to strict subcategorization features on the verb's θ -grid. Each of these possible approaches has distinct consequences, as we shall observe in subsequent discussion, further below.

Summarizing, we observe that there is a dichotomy between the [+N] categories and the [-N] categories with respect to Case assignment:

- (64) a. [-N] categories may assign Case.
 b. [+N] categories may not assign Case.
 c. [-N] categories may not be assigned Case
 d. [+N] categories may be assigned Case

(64 a,b) follow from the formulation of Case assignment in (18). (64d) follows from the fact that β is left unspecified in (18); the fact that

the [+N] categories must be assigned case when they are lexical NP arguments follows from Condition (15'). This leaves (64c).

Suppose that we elevate (64c) to the status of a theorem to be derived from the theory of Case:

(65) [-N] categories may not be assigned Case.

Conceptually, (65) seems to be a counterpart to Condition (18iii). That is, it seems that the [+N] feature defines a fundamental dichotomy within the categorial system with respect to the assignment of abstract Case, distinguishing categories which can assign Case from those to which Case may be assigned. It would be possible to derive (65) by specifically stipulating that β in (18) must be [+N], but this would fail to capture the perfect complementarity between (64a,b) and (64c,d). Moreover, we might still expect PPs to bear Case by agreement, but this does not seem to be possible. Suppose instead that Core grammar includes the following general principle:

(66) The Case-Resistance Principle (CRP)

Case may not be assigned to a category bearing a Case-assigning feature.

In terms of (66), we might view the Case features and the Case-assigning features as being "resistant" to each other-- as if they "repelled" each other, similar to like poles on a magnet. On a more prosaic level, we can think of the Case features and the Case assigning features as being conflicting feature-values, so that they are unable to appear in the same categorial matrix. This would be consistent with the view suggested above that the [-N] feature counts as a Case feature itself for the purposes of satisfying Condition (15). The Case-Resistance Principle would then be

subsumed under the general prohibition against "Case Conflict", according to which two distinct Cases may not be assigned to a single NP.

At first glance, (66) may appear to be no more than a restatement of (65); but it is not, for two reasons. First, (66) makes explicit the connection between (64a,b) and (64c,d), enabling them both to be derived from Condition (iii) in the Case assignment rule (18). Second, (66) makes a more general claim, since it does not explicitly specify the feature $[\pm N]$. To be precise, (66) predicts that Case cannot be assigned to a category bearing the feature $[+Tense]$, since this too is a Case-assigning feature, as we have already observed in Chapter 1. This has a number of interesting consequences, to which we now turn.

4.2 Recall the basic categorial distinctions among the $[+N, -V]$ categories:

(67)	Tensed clauses	$[+N, -V, +Tense, \pm Past]$
	to-Infinitives	$[+N, -V, +Tense, -----]$
	Gerunds	$[+N, -V, ---- ----]$
	NPs	$[+N, -V, -Tense, -----]$

In Chapter 1, I suggested that the basic distinction between \bar{S} and NP related to the $[\pm Tense]$ feature. Gerunds, being unspecified for this feature, come out as a neutralized category. Infinitives, contrary to some previous assumptions, come out as being $[+Tense]$; however, they are left unspecified for the $[\pm Past]$ feature, which we interpreted as having lexical content. Normally, the head position in \bar{S} is able to assign nominative Case to the subject position, but this is only possible if the head of the clause has lexical content; infinitives are therefore unable to assign Case clause-internally. In a sense, we might think of infinitives as being analogous to intransitive verbs: although each of

these categories bears a Case-assigning feature, neither is able to use them to actually assign Case. Gerunds differ from infinitives in lacking the [+Tense] feature entirely; they are unspecified for this feature, and are therefore unable to assign Case to subject position in principle. In addition, we saw that certain differences relating to strict sub-categorization and the availability of the COMP position followed from these distinctions.

The categorial distinctions in (67) enable us to investigate the effects of the Case Resistance Principle on clausal complements. We ought to expect it to be impossible for tensed clauses and to-infinitives to bear Case, by virtue of the [+Tense] feature. On the other hand, gerunds and NPs should be immune to the effects of the CRP, since they lack the [+Tense] feature. In the following discussion, we shall see that this prediction is borne out for the most part. Certain complications arise with respect to infinitival clauses, however, so we will postpone our discussion of these until Section 5. It is worth mentioning at the outset that the effects of the CRP in English coincide nicely with Reuland's (1981) observation that clausal complements in Dutch may never appear in a position of Case assignment, which he derives in a somewhat different fashion.⁴⁶

Consider first the distribution of tensed clauses vs. gerunds. Emonds (1970) observed that there are a number of environments where these categories differ markedly in their distribution. Gerunds, unlike tensed clauses, may appear as the object of a preposition:

- (68) a. He blamed it [on [Bill's being too strict]]
 b. We were talking [about [the Marines' having gone to China]]

- (69) a. *He blamed it [on [that Bill was too strict]]
 b. *We were talking [about [that the Marines went to China]]

The ill-formedness of (69) follows from the CRP, given the categorial distinction between gerunds and tensed clauses with respect to the [\pm Tense] feature. Likewise, gerunds but not tensed clauses may appear in the subject position of an infinitival clause to which Case is assigned by the governing verb:

- (70) a. I consider [_S [John's having come home] to be fortunate]]
 b. Bill showed [_S [John's having lied] to be a fact]]
- (71) a. *I consider [_S [that John came home] to be fortunate]]
 b. *Bill showed [_S [that John lied] to be a fact]]

The ungrammaticality of (71) also follows from the fact that the tensed clause appears in a position of Case assignment, given the CRP. (We consider these constructions in greater detail in Section 6.)

Before turning to other constructions, let us briefly consider how the θ -criterion is satisfied in (68) and (70). Recall that every θ -role must be assigned to an argument, and that θ -roles may only be assigned to A-positions that are A-associated with the features of PRO or Case. In terms of the theory of chains, this means that a θ -role may only be assigned to an A-chain which is headed by an A-position bearing these features. Consider first (68). Suppose, following Borer's suggestion, that the verb assigns a θ -role to the object in PP, rather than to the PP itself. In each case, the preposition can assign Case to the gerund, since it is immune to the CRP. Condition (15') is satisfied with respect to the gerund argument, and θ -role assignment can proceed in the same way as with NP arguments. Similar remarks obtain with respect to (70): the matrix verb assigns Case to the subject position of its infinitival complement; since

this is occupied by a gerund, the CRP and Condition (15') are jointly satisfied, and θ -role assignment is possible. Thus gerunds do not present any problem for the assumption that Condition (15') holds uniformly for all arguments.

In order to rule out (69) and (71), we need not necessarily assume that Case assignment is obligatory in these contexts. Suppose instead that it is optional. Then if Case is assigned to the tensed clause, the CRP is violated; if not, then Condition (15') is not satisfied, θ -role assignment is blocked, and the θ -criterion is violated. In other words, we can account for the distribution of clauses in (68-71) even if Case assignment is always optional, if we combine this with the null hypothesis that θ -role assignment to all arguments is subject to the same general conditions. It is perhaps worth mentioning that this account is only compatible with the theory of Chomsky (1980)—where the Case filter (14) takes the place of the "visibility" Condition (15') — if Case assignment is obligatory in all contexts; otherwise the CRP could be trivially circumvented by exercising the option of not assigning Case to \bar{S} .

Consider now the following structures:

- (72) a. John wondered [how [PRO to upset Mary]]
 b. *John wondered [how [Bill to upset Mary]]
- (73) a. *John wondered [how [[Bill's coming in late] to upset Mary]]
 b. *John wondered [how [that Bill arrived late] to upset Mary]

These are not structures of obligatory Control, so the ungrammaticality of (72b) and (73) cannot be attributed to the theory of Control; cf. Williams (1980) and Chapter 5 for discussion. In these structures, Case

cannot be assigned to the infinitival subject position. Even if the verb were able to assign Case across the clausal boundary, as in (70), the intervening WH-word in COMP would block Case assignment to the subject position by virtue of the adjacency condition (18ii). Therefore the only way for Condition (15') to be satisfied is for the subject position to be occupied by PRO. In (72b), the assignment of the subject θ -role is blocked within the infinitival clause, and a θ -criterion violation results. This account extends naturally to cover the gerund and tensed clause subjects in (73) — under the assumption that all cases of θ -role assignment are subject to the same conditions.

More or less the same story applies to arguments appearing at S-structure in the subject position of an infinitival complement to a raising verb:

- (74) a. [The fish]_i appears [_S[e]_i to have upset Mary]
 b. *(It) appears [_S[the fish] to have upset Mary]
- (75) a. [Bill's coming in late]_i appears [_S[e]_i to have upset Mary]
 b. [That Bill came in late]_i appears [_S[e]_i to have upset Mary]
- (76) a. *(It) appears [_S[Bill's coming in late] to have upset Mary]
 b. *(It) appears [_S[that Bill came in late] to have upset Mary]

In (74) the raising verb governs but does not assign Case to the embedded subject position. NP-movement must apply, so as to form an A-chain which includes the main clause subject position where nominative Case is assigned. θ -role assignment is therefore possible in (74a) but it is blocked in (74b) because the embedded subject position is not included in a chain which satisfies (15').

The sentences in (76) are directly analogous to (74b); the embedded subject position is not part of an A-chain that is headed by PRO or Case, so θ -role assignment is blocked, and the θ -criterion is violated. Now consider (75). Here it seems that the θ -criterion is satisfied, implying that the trace in the embedded subject position is part of an A-chain to which Case is assigned. This is straightforward in (75a), because we can simply assume that nominative Case is assigned to the gerund in subject position. But in (75b), the assignment of nominative Case to the tensed clause should result in a violation of the Case Resistance Principle. Apparently, however, this is not the case.

The problem posed by (75b) is not unique to Raising structures, but in fact is quite general:

- (77) a. [That Jenny is a good hostess] is self-evident
 b. [That Pauline moved to Kansas] surprised me
 c. [That Brian dyed his hair] proves nothing

In each of these sentences, we might expect the θ -criterion to come into conflict with the CRP. In order to receive a θ -role, the tensed clause must appear in an A-chain to which Case is assigned; but the clause cannot bear Case without violating the CRP.

The basis for the solution to this problem is due originally to Emonds (1976) and Koster (1978).⁴⁷ Emonds suggests that the tensed clauses in (75b) and (77) are not really in subject position, but rather in Topic position. The constructions are deceptive only by virtue of the fact that Topicalization is string-vacuous in the case of movement from subject position to an adjacent COMP.

This account is supported by the fact that tensed clauses, unlike gerunds, may only appear as "subjects" in environments where Topics can also appear:

- (78) a. John's belief [(that) [[your taking the course] helped you]] is unfounded.
 b. Although [[the house's being empty] may depress you], ...
- (79) a. *John's belief [(that) [[that you took the course] helped you]] is unfounded.
 b. *Although [[that the house is empty] may depress you], ...
- (80) a. *John's belief [(that)[the Geography course]_i, Bill really wanted to take [e]_i] is unfounded
 b. *Although [with his sister]_i John was reluctant to travel [e]_i ...

Suppose, then, that tensed clause "subjects" are really Topics.

In terms of the Case Resistance Principle, this makes perfect sense. In each case, we can assume that the tensed clause appears in subject position at D-structure, but is unable to remain there at S-structure without violating the CRP. Therefore it must move to a non-A-position, leaving a trace in the subject position, which it binds as a variable. Nominative Case is assigned to the variable, which functions as the argument at the head of the A-chain, just as in any other Topic construction. Thus the Topic structure serves as a "saving device" for escaping the effects of the CRP. This position is unavailable for the tensed clause "subjects" in (79), just as it is unavailable for the NP or PP topics in (80).

Notice that this account crucially assumes that the trace of \bar{S} is immune to the effects of the CRP. There are two possible ways of deriving this result. First, we might assume that categorial features are not among the features that are "left behind" by the application of *Move- α* .

Then Case could freely be assigned to the trace of \bar{S} , since the trace would not bear either of the Case-assigning features. Another approach would be to assume that the CRP only applies to the lexical head of a phrase, rather than to the phrase as a whole. If traces have no internal structure and are without lexical content, then they would be immune to the effects of the CRP. I will not attempt to choose between these two possible accounts here.

Another account of the "obligatory Topicalization" of subject \bar{S} arguments is offered by Koster (1978a). He suggests that the subject position of S is defined as an NP position by the rules of the base. Then if X-bar theory disallows categorial rules of the form (81), it follows that no \bar{S} may ever appear in subject position:

(81) $NP \rightarrow \bar{S}$

According to this account, the sentences in (79) are ruled out because S may not appear in subject position at D-structure. Analogous sentences involving movement from the subject position of the complement to a Raising verb are ruled out because NP-movement is "structure-preserving" in the sense of Emonds (1970): only NP may move to a position that is specified by the base rules as an NP position.

Koster's theory derives the obligatoriness of Topicalization with respect to \bar{S} subjects in a principled fashion, but his solution is unavailable to us if the categorial component does not exist.⁴⁸ It is only by virtue of specifying the subject position of S as an NP position that Koster's account is viable, and if such specifications are not possible, then the effect of obligatory Topicalization must be attributed to the CRP

instead. In the CRP account, we are free to assume that \bar{S} can appear in subject position at D-structure. Thus our analysis is not crucially dependent on the assumption that Topic constituents are base-generated in Topic position, as proposed by Chomsky (1977). This has a significant consequence with respect to infinitival complements, as we shall see in Section 5.

4.3 A tensed clause that appears in subject position at D-structure also has another option open that simultaneously satisfies the CRP and the θ -criterion. Recall that NP subjects may move to postverbal position, where they adjoin to the right of VP:

- (82) a. [There]¹ [[has walked into the room] [a man from India]¹]
 b. [There]¹ [[has occurred] [a terrible disaster]¹]

In (82), the postverbal subject and the pleonastic element in subject position together form an A-chain, implying that the VP-adjoined position can be interpreted as an A-position, as noted previously. Nominative Case is assigned to *there*, which appears in the head position of the A-chain, so Condition (15') and the θ -criterion are satisfied. Exactly the same option is available for \bar{S} arguments which appear in subject position at D-structure, deriving the so-called *it*-Extraposition construction:

- (83) a. [It]¹ [[is self-evident] [that Jenny is a good hostess]¹]
 b. [It]¹ [[surprised me] [that Pauline moved to Kansas]¹]
 c. [It]¹ [[proves nothing] [that Brian dyed his hair]¹]

The sentences in (83) contain A-chains which include (i) the pleonastic *it* in true subject position, and (ii) the \bar{S} argument, which appears in the postverbal A-position adjoined to VP. Since nominative Case is

assigned to *it*, the A-chain is headed by a Case-marked position and Condition (15') is satisfied, making θ -role assignment possible. Case is not assigned to the \bar{S} itself, so the CRP is not violated.

Since the extraposition structure does not make use of Topic position to escape the effects of the CRP, it can appear in embedded contexts where Topics are disallowed:

- (84) a. John's belief [that $[[it]^1$ $[[helped\ you]$ $[that\ you\ took\ the\ course]^1]]$
is unfounded
b. Although $[it]^1$ $[[may\ depress\ you]$ $[that\ the\ house\ is\ empty]^1]...$

This derives the effect of *it*-Extraposition being "obligatory" in such contexts; cf. Emonds (1970).

The *it*-Extraposition structure is also permitted for the Raising cases in (75b) and (76b). Actually, two derivations are permitted. First, the \bar{S} argument can adjoin to the VP within the infinitival complement, followed by insertion of pleonastic *it* and subsequent raising to the main clause subject position:⁴⁹

- (85) a. $[e]$ appears $[_S [that\ Bill\ came\ in\ late] [to\ have\ upset\ Mary]]$
b. $[e]$ appears $[_S [e]^1 [[to\ have\ upset\ Mary] [that\ Bill\ came\ in\ late]^1]]$
c. $[e]$ appears $[_S [it]^1 [to\ have\ upset\ Mary] [that\ Bill\ came\ in\ late]^1]$
d. $[it]_j$ appears $[_S [e]_j^1 [to\ have\ upset\ Mary] [that\ Bill\ came\ in\ late]^1]$

It is not crucial to assume that *it*-Insertion applies before Raising does in (85); the same S-structure chain would be derived if the empty category in (85b) were to raise to subject position prior to the insertion of *it* at S-structure.

The reason for assuming that the D-structure representation is (85a) rather than (85c) is that we derive the co-indexing between the "true"

subject position and the VP-adjoined position for free, as an automatic consequence of *Move α* . Otherwise, we would need a special rule to co-index the two positions. Although such rules appear to be allowed as a special lexical property for some verbs, the *it*-Extrapolation structure is as freely available to an \bar{S} subject as the Topicalization structure is. It therefore represents an unnecessary complication to stipulate for each verb that such a structure is possible, since the possibility is implied by the theory of grammar, as a direct parallel to other postverbal subject constructions.⁵⁰

There is an alternative derivation for the D-structure in (85a) which also involves *it*-Extrapolation. Specifically, subject postposing can apply to the output of Raising, as in (86):

- (86) a. [e] appears [_S[that Bill came in late] [to have upset Mary]]
 b. [that Bill came in late]_j appears [[e]_j [to have upset Mary]]
 c. [e]_j¹ [[appears [[e]_j to have upset Mary]] [that Bill came in late]_j¹]
 d. [it]_j¹ [[appears [[e]_j to have upset Mary]] [that Bill came in late]_j¹]

In (86), the \bar{S} argument appears at D-structure in a position adjoined to the main clause VP in the infinitival complement. The structural ambiguity apparent in the distinction between (85) and (86) raises an issue of indeterminacy that I will not attempt to resolve here. It is conceivable that the theory of grammar should rule out one of these structures, perhaps exploiting the fact that the relevant A-chains differ in the c-command relations between the postverbal subject and the original θ -position. But it is far from obvious which structure should be excluded, and on what grounds. In addition, the extrapolation structure has a number of other curious properties which we will not consider here.⁵¹

One interesting aspect of this analysis of *it*-Extraposition is that it puts us in a position to derive Baltin's (1978) observation that the landing site of *it*-Extraposition differs from that of Relative Clause Extraposition. (This is also noted by Reinhart, 1980). Specifically, it seems that *it*-Extraposition always involves adjunction to VP, while a relative clause that is extraposed from subject position appears as a constituent of S. Suppose that an extraposed relative clause must c-command its trace at S-structure.⁵² It then follows that the clause cannot adjoin to VP, since c-command would not be possible from this location, unless the clause originates in VP. On the other hand, the c-command requirements are reversed in the *it*-Extraposition structure, if the pleonastic *it* must appear as the head position in the chain, bearing Case. If the postverbal argument in the *it*-Extraposition construction were to adjoin to S, then pleonastic *it* would not be the head position of the chain, given the definition of c-command in (54).⁵³

In addition, there are a number of interesting properties of the *it*-Extraposition construction, which we will not consider here in detail. For instance, there are some examples noted by Jackendoff (1977) which appear to involve extraposed PPs; on the other hand, NPs and gerunds may not appear as extraposed arguments in a chain headed by pleonastic *it*. There appears to be a correlation between the status of the extraposed argument with respect to the CRP and its ability to extrapose; on the other hand, it is not obvious how this follows from the theory developed here.

4.4 Let us now turn our attention to structures in which \bar{S} appears at D-structure as a subcategorized complement in VP:

- (87) a. Paul already knows [that Jim lives with his sister]
 b. Jenny forgot to mention [that the water is bad]
 c. I think Mary has always resented [that she was born poor]

As we expect, these clauses may move to Topic position, leaving a trace in the argument position in VP to be assigned objective Case:

- (88) a. [That Jim lives with his sister]_i, Paul already knows [e]_i
 b. [That the water is bad]_i, Jenny forgot to mention [e]_i
 c. [That she was born poor]_i, I think Mary has always resented [e]_i

In these sentences, the CRP and the θ -criterion are jointly satisfied. The CRP is satisfied because the tensed clause appears at S-structure in Topic position, and thus avoids being assigned Case. Instead, Case and θ -role are assigned to the variable in the A-position in VP, as required by the θ -criterion.

On the other hand, the grammaticality of the sentences in (87) appears to argue against our account. Specifically, one might presume, on the basis of (87), that either (i) tensed clausal complements can be Case marked after all, or (ii) θ -roles can be assigned directly to these complements, without satisfying the condition on θ -role assignment in (15').

But this argument is only as strong as the underlying assumption that the clausal complements in (87) are actually sitting in the argument position in \bar{V} . Suppose instead that the clausal objects in (87) are actually in the non-A-position at the end of VP, binding a trace in the A-position adjacent to the verb:⁵⁴

- (89) a. Paul already [\bar{V} knows [e]_i] [that Jim lives with his sister]_i
 b. Jenny forgot to [\bar{V} mention [e]_i] [that the water is bad]_i
 c. I think Mary has always [\bar{V} resented [e]_i] [that she was born poor]_i

In (89), the extraposed clause appears in a non-A-position at the end of VP; it binds its trace in \bar{V} as a variable, just as a topicalized \bar{S} does. Since the variable appears immediately after the verb, it is assigned Case under adjacency. It therefore satisfies Condition (15), and it counts as the A-chain to which the object θ -role is assigned.

This Extraposition construction is really the same as the Focus NP Shift construction that we discussed in Section 3. In each case, the rule responsible for postposing the argument to the VP-adjoined position is simply the core syntactic rule *Move α* . With NP objects, the construction is normally used only to focus the NP -- regardless of whether it is heavy, indefinite, new information, or whatever, as noted by Rochemont (1978). For this reason, Focus NP Shift is normally limited to Emonds' (1970) "root" environments. But Hooper and Thompson (1973) showed that the "root" environments are actually more general, and can include virtually all environments of asserted (as opposed to presupposed) material. In other words, Hooper's and Thompson's observations can be taken to show that the limited distribution of the Focus NP Shift construction is not a fact that the theory of grammar should account for; it is a paragrammatical phenomenon, related to principles of discourse. (In this respect, it differs from Topicalization which makes crucial use of the COMP position, as shown by 79, 80).

Unlike the stylistically-motivated extraposition of NP, the extraposition of \bar{S} is forced by the interaction of two deep principles of grammar: the θ -criterion and the Case-Resistance Principle. This is reflected in the fact that \bar{S} arguments can freely appear in the VP-adjoined position in

subordinate clauses, despite the fact that the derived constructions are grammatically equivalent to Focus NP Shift constructions. This grammatical equivalence is also reflected in shared intonational properties; in particular, there is a characteristic pause before the extraposed constituent in each case, as has been noted in the literature.

The CRP and the θ -criterion thus combine to derive Emonds (1976) observation that extraposition of \bar{S} is apparently obligatory in the case of object complements if Topicalization does not apply. This is reflected independently by the fact that a postverbal tensed clause complement must always follow other subcategorized complements:

- (90) a. Mary said $[e]_1$ quietly $[that\ she\ wanted\ to\ drive]_1$
 b. Paul mentioned $[e]_1$ to Bill $[that\ his\ shirt\ was\ dirty]_1$
 c. John knew $[e]_1$ from experience $[that\ the\ law\ was\ unfair]_1$
- (91) a. ?*Mary said $[that\ she\ wanted\ to\ drive]$ quietly
 b. ?*Paul mentioned $[that\ his\ shirt\ was\ dirty]$ to Bill
 c. ?*John knew $[that\ the\ law\ was\ unfair]$ from experience

At D-structure, all subcategorized complements must appear in \bar{V} . The ungrammaticality of (91) suggests that multiple adjunction to VP is impossible, so that only one complement may move out of \bar{V} to the VP-final non-A-position. The interaction of the CRP and the θ -criterion combine to ensure that the extraposed constituent is the direct object \bar{S} complement in (90-91).

One can imagine alternative explanations of the judgments in (91) which appeal to the fact that the clause is too "heavy" to appear in the middle of the sentence, and stylistic factors favor the extraposed structure. But in fact specifiers such as PP are free to appear after \bar{S} , just as long as the theory of subcategorization does not require them to appear at D-structure in \bar{V} :

- (92) a. John knew that the law was unfair [before anyone else]
 b. Paul mentioned to Bill that his shirt was dirty [last week]
 c. Fran reported that the fish were alive [upon her return]

4.5 So far, the only cases of tensed clause complements that I have discussed involved verbs which assign Case. Each verb assigns Case to the trace of its clausal complement, which functions as a variable, analogous to the variable found in WH-movement and Topic constructions. However, tensed clauses also appear as complements of Raising verbs and passive participles. Since these verbs do not assign Case, some other factor must be involved in allowing θ -role assignment to these complements.

Let us first turn our attention to the passive cases. At first glance, it seems that θ -role assignment to tensed clause complements is utterly unaffected by the shift from active to passive, which ought to be surprising, if Case assignment to the trace of \bar{S} is crucial for θ -role assignment in the active forms:

- (93) a. Paul reported [that the pills were powerful]
 Kathy will reveal [that a crime has been committed]
 b. It has been reported [that the pills were powerful]
 It will be revealed [that a crime has been committed]

All of the research on passive participles suggests that they lack the ability to assign Case, but if Case assignment to the trace of \bar{S} is necessary for θ -role assignment to proceed, then we might expect θ -criterion violations in (93b). Another problem is that the \bar{S} complement of a passive verb must always appear after the other constituents in \bar{V} :

- (94) a. It has been revealed [to us] [that a crime has been committed]
 b. *It has been revealed [that a crime has been committed] [to us]

This appears to cast doubt on our previous hypothesis that the \bar{S} complements

of active verbs move to this position so as to avoid violating the Case Resistance Principle.

It seems that the apparent equivalence of the active and passive \bar{S} complement structures is superficial, however. Recall that NP complements of passive verbs normally raise to the subject position by *Move α* :

- (95) a. [John]_i was visited [e]_i by Mary
 b. [The news]_i was reported [e]_i by Paul

This is also possible for \bar{S} complements, provided that they subsequently move out of subject position so as to avoid being assigned nominative Case in violation of the CRP:

- (96) a. [That the pills were powerful]_i [_S [e]_i has been reported [e]_i (by Paul)]
 b. [That a crime has been committed]_i [_S [e]_i will be revealed [e]_i (by Kathy)]

The existence of sentences like (96) immediately suggests a solution to the problem of θ -role assignment in (93). These sentences, like those in (96), involve "NP-movement" of the \bar{S} complement to subject position.⁵⁵ Instead of moving to the Topic position, as in (96), the clauses in (93) undergo *it*-Extraposition, directly parallel to the sentences in (83) and (86). As in the active sentences in (90), the \bar{S} complement adjoins to the right of VP; but in this case, the VP-adjoined position is interpreted as part of an A-chain headed by pleonastic *it* in subject position, rather than as a non-A-position which binds a variable in \bar{V} . Thus although these clauses must appear at the end of VP, like the complements of the active verbs, it is for an entirely independent reason.

Let us now consider the tensed clause complements of Raising verbs such as *seem*, *appear*, *prove*, etc:

- (97) a. It seems (to us) [that John is guilty]
 b. It appeared (to the police) [that the mayor liked the wine]

If we make the standard assumption that the Raising verbs never assign Case, it follows that their complements cannot move directly to a non-A-position, since the trace would not satisfy Condition (15') and hence could not receive a θ -role. Therefore the complement must be part of an A-chain which is headed by pleonastic *it* in subject position. The simplest way of deriving this chain is by the same two-step derivation that held for the passive cases: movement to subject position followed by *it*-Extraposition:

- (98) a. [e] [seems [that John is guilty]]
 b. [that John is guilty]_j [seems [e]_j]
 c. [e]_jⁱ [[seems [e]_j] [that John is guilty]ⁱ]
 d. [It]_jⁱ [[seems [e]_j] [that John is guilty]ⁱ]

This predicts -- correctly, I believe -- that the clause must appear after the other subcategorized complements of the raising verb:

- (99) a. ?*It seems [that John is guilty][to us]
 b. ?*It appeared [that the mayor like the wine][to the police]

These sentences would then be directly parallel to the passive constructions considered above.

There is one problem with this scenario, however: it predicts that after preposing to subject position, as in (98b), the clause should be able to move to Topic position. But such sentences are ungrammatical:

- (100) a. *[That John is guilty]_i [_S[e]_i seems (to us) [e]_i]
 b. *[That the mayor liked the wine]_i [_S [e]_i appeared [e]_i]

I know of no genuine explanation for this often-noted fact. Both of the sentences in (100) should by all expectations be grammatical, regardless

of what order the \bar{S} and PP complements appear in at D-structure. Assume the clause to appear in Topic position at S-structure. Then the two traces should form an A-chain headed by the nominative Case-marked trace in subject position. Moreover, Raising verbs are perfectly compatible with topicalized \bar{S} , if it moves from the embedded subject position as in (75b). There are various possible accounts of the obligatory extraposition effect in (100), none of which seems particularly attractive.⁵⁶

It is worth noting, incidentally, that the problem is limited to the Raising verbs; Raising adjectives allow their complements to topicalize from subject position:

- (101) a. [That John likes Susan]_i [e]_i is certain [e]_i
 b. [That the war is over]_j [e]_j is hardly likely [e]_j

The verb/adjective a symmetry suggests that the ultimate explanation for (100) may involve Case assignment on the part of the Raising verbs, but I will not pursue this possibility here.⁵⁷

4.6 The fact that the VP-adjoined position can be interpreted either as an A-position or as a non-A-position deserves some comment. It is not clear whether this freedom reflects an ambiguity in the structure of VP. Recall the definition of non-A-position presented in Chapter 2:

(102) Non-A-position

In the configuration [_{γ} $\alpha\beta$] α is a non-A-position with respect to β , if

- (i) γ is a projection of β , and
- (ii) $\beta = \bar{X}$, and
- (iii) α and β are both immediate constituents of γ .

If (102) is correct, then extraposed tensed clause complements and NPs in Focus NP Shift constructions must appear in a position adjoined to \bar{V} .

The ambiguity arises with respect to the adjunction position in *it*-Extrapolation constructions. Perhaps the definition of A-positions overlaps with that of non-A-positions in the case of adjunction to \bar{V} . Alternatively, it could be that the \bar{V} is non-branching, so that \bar{V} and $\bar{\bar{V}}$ have no hierarchical distinction, as in the theory of Lasnik and Kupin (1978). Then *Move α* might have the option of choosing between adjunction to \bar{V} and adjunction to $\bar{\bar{V}}$ in such a case. We might then suppose that *it*-Extrapolation chooses to adjoin to \bar{V} , while object extrapolation chooses adjunction to $\bar{\bar{V}}$. The \bar{V} -adjoined position would be the A-position, while the $\bar{\bar{V}}$ -adjoined position would be the non-A-position. I will leave this matter undecided at present, but we shall return to it in Section 8.

5. Infinitival Complements

5.1 In the preceding section, I discussed the interaction of the θ -criterion and the Case Resistance Principle with respect to PPs, gerunds, and tensed clauses when they function as arguments. Since gerunds are not headed by any Case-assigning feature, they are free to be assigned Case and thereby satisfy Condition (15') directly. But the CRP dictates that PPs and tensed clauses may never bear Case, so these categories may never appear in a position of Case assignment at S-structure. PPs differ from tensed clauses with respect to θ -role assignment when they appear as complements in \bar{X} . Specifically, PP complements satisfy Condition (15') directly; so they may appear in \bar{V} at S-structure, perhaps because of the phenomenon of compositional θ -role assignment. This option is unavailable to tensed clause complements, however, and they must move out of \bar{V} . When the governing verb assigns Case, the clause moves to a non-A-position and binds a variable at S-structure; when the governing verb is a Raising verb or a passive participle, the clause moves to the matrix subject position, and then undergoes Topicalization or *it*-Extraposition.

In this section, we will turn our attention to infinitival clauses. In Chapter 1, I argued that these share with tensed clauses the abstract [+Tense] feature, but I suggested that this feature can't be used to assign Case to subject position because the head of the clause is without lexical content, lacking the [+Past] feature.

On the basis of their categorial status, we might expect *to*-infinitives to behave in exactly the same way as tensed clauses, abstracting away from the arbitrary effects of selectional properties of individual verbs.

It seems, however, that this is not quite true. As it turns out, to-infinitives share a number of properties of PPs, especially when they appear as subcategorized complements in \bar{X} .

First of all, to-infinitives show obvious CRP effects. Like tensed clauses, they may never appear as the object of a preposition: cf. (69):

- (103) a. *He blamed it [on [(for Bill) to have been too strict]]
 b. *We were talking [about [to have gone to China]]

Similarly, they may never appear as the subject of another infinitival clause, if this position is assigned Case by the matrix verb:

- (104) a. *I consider [[to come home] to be easy]
 b. *Bill showed [[for John to have lied] to be a fact]

Finally, they may never appear in the subject position of a tensed clause, as can be shown by checking the structures where Topicalization is disallowed:

- (105) a. *John's belief [(that) [(for you) to take this course] would help you] is unfounded
 b. *Although [[for you) to take this course] would help you] ...

As with tensed clauses, there are two "saving devices" available for the structure in (105): the clause can move to Topic position, as in (106), or it can undergo *it*-Extraposition, as in (107):

- (106) a. [(For you) to take this course]₁ [[e]₁ would help you]
 b. [It]₁ⁱ [[would help you] [(for you) to take this course]₁ⁱ]
 (107) a. John's belief [that it would help you [(for you) to take this course]] is unfounded
 b. Although it would help you [(for you) to take this course] ...

In (106) and (107), the θ -criterion is satisfied, because there is an A-chain which is headed by a Case-marked position. In (106), the A-chain consists solely of the variable in subject position, which is assigned nominative Case. In (107), the A-chain consists of the clause adjoined to the right of VP, and pleonastic *it*, which bears nominative Case in the head position of the chain. When there is no Case-marked A-chain that satisfies (15'), the θ -criterion is violated, and the sentence is ungrammatical even though there is no problem from the perspective of the CRP:

- (108) a. *Bill wondered [how [[to have come home] to have upset Mary]]
 b. *It appears [[(for Bill) to have come home] to have upset Mary]

On the basis of the patterns in (103-108), there is every reason to assume that *to*-infinitival clauses behave in exactly the same way as tensed clauses with respect to the interaction of the CRP and the θ -criterion. This makes sense, if both clausal types share the abstract categorial feature [+Tense].

5.2 In other respects, however, *to*-infinitives do not behave at all like tensed clause or gerund complements, displaying instead certain properties characteristic of PPs. To be specific, all of the relevant evidence suggests that *to*-infinitive complements are not dependent in any way upon the Case-assigning properties of the governing verb.

First of all, infinitival clauses are more or less freely ordered with respect to other arguments in VP such as PPs and adverbs:

- (109) a. John has promised [repeatedly] [to help us]
 John has promised [to help us] [repeatedly]
 b. Frank wants [very badly] [to visit us]
 Frank wants [to visit us] [very badly]
- (110) a. John explained [to Bill] [how to open the jar]
 b. John explained [how to open the jar] [to Bill]
- (111) a. Jack seems [to us] [to be rather dull]
 b. Jack seems [to be rather dull] [to us]

Of course, when the verb also takes an NP object, the NP must appear next to the verb at D-structure, so as to satisfy the adjacency requirement on Case assignment, but the other complements are freely ordered:

- (112) a. Janice reminded [Jenny] [repeatedly] [to turn down the music]
 b. Janice reminded [Jenny] [to turn down the music] [repeatedly]
 c. *Janice reminded [repeatedly] [Jenny] [to turn down the music]

Although there are some restrictions on the order of PP complements in Control structures, these constructions all seem somewhat marginal, and the relevant distinctions may be due to the theory of Control.⁵⁸

These facts make sense if infinitival clauses are intrinsically Case-marked, like a PP. If infinitivals -- like tensed clauses -- had to move to the end of \bar{V} in order to bind a Case-marked trace so as to satisfy the θ -criterion, then we would not expect other subcategorized complements to be able to follow them; cf. (91), (94b), and (99) above.

Derived nominal constructions provide further evidence that infinitival clauses are not dependent in any way upon Case assignment in order for θ -role assignment to proceed. Recall that derived nominals do not assign Case to their objects, and of-Insertion must apply so as to satisfy Condition (15'):

- (113) a. The enemy destroyed [the city]
 b. The enemy's destruction of-[the city]
 c. *The enemy's destruction [the city]

Gerund complements behave in exactly the same way, as we should expect if all arguments are subject to the same conditions on θ -role assignment:

- (114) a. John discussed going home with us
 Paul remembered eating the apple
 b. John's discussion of going home with us
 Paul's memory of eating the apple
 c. *John's discussion going home with us
 *Paul's memory eating the apple

But infinitival clauses are free to appear as complements of derived nominals, without requiring any special dummy Case marker:

- (115) a. Ken attempted to finish on time
 John pretended to be my friend
 b. Ken's attempt to finish on time
 John's pretense to be my friend

Thus *to*-infinitives behave just like PPs with respect to θ -role assignment by a derived nominal head, which makes sense if they are able to satisfy Condition (15') intrinsically. (I will discuss tensed clause complements in derived nominals in Section 6.)

The preceding discussion suggests that *to*-infinitival complements are not dependent upon Case assignment from a governing head in order for θ -role assignment to proceed. Notice, however, that this is only true when the clause appears as a subcategorized complement. As with PPs, θ -role assignment is not possible when the clause appears in a non-subcategorized subject position where no Case is assigned, as shown by (108); see Section 4.1 for discussion.

With respect to the fact that no verb must assign Case to a subcategorized infinitival complement, it appears that an even stronger claim can be made: no *to*-infinitival may appear at D-structure in a position which is assigned Case by a governing verb at S-structure. The relevant evidence concerns Passive and Topic constructions; I shall consider each of these in turn.

Recall that every verb which assigns Case to a complement has a passive participial counterpart with the same strict subcategorization frame. In the Passive construction, each complement must appear in \bar{V} at D-structure so as to satisfy the participle's strict subcategorization requirements. But at S-structure, each θ -position must satisfy (15'). In the case of a tensed clause complement of a passive participle, it will first move to subject position, and then either undergo *it*-Extraposition, as in (116b), or Topicalization, as in (116c):

- (116) a. John [knew/expected [that the water would be clean]]
 b. It_j^1 [[was known/expected [e]_j] [that the water would be clean]¹]
 c. [That the water would be clean]_i [e]_i [was known/expected [e]_i]

But when the same verbs (or any other verbs, for that matter) appear at D-structure with an infinitival complement instead of a tensed clause, there is no grammatical S-structure corresponding to either (116b) or (116c):

- (117) a. John [knew/wondered [how to fix the sink]]
 b. Chris [expected/promised [to fix the sink]]

- (118) a. $*It_j^1$ [[was known/wondered [e]_j] [how to fix the sink]¹]
 b. $*It_j^1$ [[was expected/promised [e]_j] [to fix the sink]¹]

- (119) a. *[How to fix the sink]_j [[e]_j [was known/wondered [e]_j (by John)]]
 b. *[To fix the sink]_j [[e]_j [was expected/promised [e]_j (by Chris)]]

At first glance, this seems to be the opposite of what we should predict, if infinitival complements are not dependent upon Case assignment in the corresponding active sentences. The solution to this apparent paradox lies in the grammatical status of passive morphology in English with respect to the Case assigning properties of the verb in specific strict subcategorization frames.

It is well known that passive morphology in English always represents the absorption of objective Case. For this reason intransitive verbs and Raising verbs never passivize:⁵⁹

- (120) a. John walked [into the room]
 b. *It was walked [into the room] (by John)
 c. *[Into the room] was walked -- (by John)

- (121) a. It seems [that John is tired]
 b. *It is seemed [that John is tired]
 c. *[That John is tired] is seemed

Suppose now that Control verbs are unable to assign Case to their infinitival complements. (More precisely, suppose that no verb is able to assign Case to a position that is occupied at D-structure by an infinitival clause.) Then the verbs in the Control structures in (117) would count as intransitive as far as the principles of Case assignment are concerned, despite the fact that they appear with clausal direct object complements which are otherwise parallel to those found in (116). This means that the contrast between tensed clause and infinitival complement structures with respect to passivization follows from the general

fact that intransitives do not passivize, and need not be stipulated as a property of Control structures per se.⁶⁰

In fact, when a subcategorized object NP co-occurs in VP with a Control complement, passivization is possible. This follows from the fact that the verb assigns Case to the object in the relevant strict subcategorization frame:

- (122) a. Someone ordered [John] [to leave home]
 b. We asked [our brother] [how to fix the sink]
- (123) a. [John]_i was told [e]_i [to leave home]
 b. [Our brother]_i was asked [e]_i [how to fix the sink]

Thus we can predict the possibility of passivized control structures exclusively on the basis of the fundamental distinction between transitive and intransitive verbs, given the assumption that verbs are unable to assign Case to the position occupied at D-structure by the Control complement itself.⁶¹

In fact there is further evidence for the assumption that no verb may ever assign Case to a position occupied at D-structure by an infinitival complement. Recall that infinitives, like gerunds and tensed clauses, are free to appear in Topic position when they bind a trace in subject position:

- (124) a. [That John is a fool]_i Bill thinks [[e]_i is obvious]
 b. [Reading your book]_i I am sure [[e]_i will be a pleasure]
 c. [To leave now]_i [[e]_i would be rather impolite]

In addition, tensed clauses and gerunds may topicalize from object position:

- (125) a. [That the water is bad]_i I believe Jenny forgot to mention [e]_i
 b. [The water's being bad]_i I believe Jenny forgot to mention[e]_i

Curiously, however, infinitives may never topicalize from object position in VP, as observed by Robert May (personal communication):

- (126) a. I asked John [who to visit]
 b. John seems [to be stupid]
 c. I never expected [to be invited]
 d. Bill thinks that we were hoping [for Scott to arrive late]
- (127) a. *[Who to visit], I asked John [e]
 b. *[To be stupid], John seems [e]
 c. *[To be invited], I never expected [e]
 d. *[For Scott to arrive late] Bill thinks we were hoping [e]

If verbs may never assign Case to their infinitival complements, these facts make perfect sense. In order for a well-formed Topic structure to result, the verb must assign Case to the trace of the topicalized constituent. Evidently, this is not possible for the infinitival clauses in (127).⁶²

It is perhaps worth pointing out the significance of this fact for the analysis of Topicalization constructions. It is not the case that the verbs in (127) are all incompatible with Topic constructions. Thus *ask* and *expect* are free to assign Case to the trace of an NP Topic, while *expect* and *hope* can assign Case to the trace of a tensed clause Topic. The fact that the sentences in (127) are ungrammatical indicates that an infinitival Topic is unable to make use of a Case-marked NP trace in order to satisfy the θ -criterion. This counts as empirical evidence in favor of the CRP account of the obligatory topicalization of subject sentences over Koster's (1978a) account in terms of the subject position of S being

defined as an NP position in the base. Koster's account crucially assumes that \bar{S} Topics can make use of a WH-trace with the categorial status of NP; but if this were possible, then (127a,c) should be grammatical in the same way. The only way to rule out (127) is to assume that the infinitival clause must appear in the A-position at D-structure; since this is required in (127), it is presumably also necessary for the topicalized subjects discussed in the previous section. But if \bar{S} must be permitted to appear in the subject position at D-structure, then only the CRP will force it out of this position at S-structure.

PPs differ from *to*-infinitives with respect to WH-movement and Topicalization; they are free to move to a non-A-position, despite the fact that they are not assigned Case by a governing verb. We can interpret this as follows. Suppose, following Chomsky (1977, 1981) that there is a rule of Reconstruction mapping from S-structure to Logical Form, which has the effect of taking an argument from a non-A-position and returning it to a θ -position with which it is co-indexed. Suppose further that PP θ -roles are determined compositionally, as suggested by Borer. We might then assume that the composition of the θ -role that is assigned to the object of the preposition takes place at LF. The actual assignment of the θ -role will then apply to the output of Reconstruction, so there will be no need for the verb to assign Case to the trace of PP at the point at which the relevant θ -role is assigned. Since the preposition assigns Case to its NP object, the NP will satisfy Condition (15') when compositional θ -role assignment applies at LF. This option is unavailable to the infinitival Topics in (127) because subcategorized \bar{S} complements are not assigned a compositional θ -role. Therefore they must meet the normal conditions on

θ -role assignment to A-chains at S-structure, and Reconstruction applies too late to satisfy (15') at the appropriate level.

5.3 It seems, then, that a number of phenomena fall into place very nicely if we assume that a governing verb never assigns Case to a complement position which is occupied at D-structure by a *to*-infinitival clause, and that the clause intrinsically satisfies Condition (15'). It is less clear, however, exactly how this result should be derived.

One possibility would be to exploit the fact that infinitival clauses come with the particle *to*. Recall that *to* also appears as a kind of dummy preposition which assigns Case to indirect object NPs, enabling them to get around the effects of the adjacency requirement on Case assignment. Suppose that *to* also functions as a dummy Case marker when it appears with an infinitival clause, as suggested by Reuland (1981a). This would account for the fact that the clause is intrinsically capable of satisfying Condition (15'), making Case assignment by the verb superfluous.

But infinitival *to* cannot be viewed simply as a dummy Case-marker analogous to the *to* which is adjoined to indirect object NPs. First of all, infinitival clauses always appear with *to*, even when it is not required for the purposes of θ -role assignment. Thus infinitival relative clauses do not function as arguments but they come with the particle *to* just the same; similarly, postverbal infinitival subjects in *it*-Extraposition constructions come with *to*, even though the A-chain in which they appear is assigned Case independently in the head position occupied by the pleonastic element. A second problem with the view that infinitival *to* is a dummy Case marker is that if infinitival clauses have the categorial

feature of \bar{S} (i.e. [+Tense]), then it is not clear how they can be assigned Case by a dummy preposition without violating the CRP.⁶³ Finally, infinitival *to* appears within the clause in a position following the subject, as is shown overtly when this position is assigned Case. This potentially raises problems for the assumption that it is a dummy Case-marker for the entire clausal complement, as observed by N. Chomsky (personal communication).⁶⁴

Suppose, then, that infinitival *to* is actually the head of the infinitival clause, and that its [-N] feature counts as a Case feature for the purposes of satisfying Condition (15'), analogous to the proposal in Section 4.1 with respect to the intrinsic "visibility" of PPs when they appear as subcategorized complements. This would derive the fact that θ -role assignment to infinitival complements is not dependent upon Case assignment by a governing verb or preposition, deriving their PP-like behavior with respect to derived nominals and their freedom of order in \bar{V} . As with PPs, the [-N] feature must be linked to a subcategorization frame in order to satisfy Condition (15'), as shown by the θ -criterion violations in (108). In addition, it seems that when *to* appears as the head of an infinitival complement to a verb at D-structure, it neutralizes the Case-assigning properties of that verb with respect to the position occupied by the complement, thus disallowing Passive and Topicalization constructions.

But this approach raises a problem with respect to strict subcategorization. If the [-N] feature of *to* counts for the purposes of "visibility", then we ought to expect it to prevent infinitival clauses from forming a natural categorial class with tensed clauses and NPs, both of which are [-N]. In fact, however, this is not the case, as noted in Chapter 1.

This means that we have to stipulate that the [-N] feature is in some sense compatible with the conflicting [+N] subcategorization feature in an infinitival clause. The [+N] value is relevant for subcategorization, while the [-N] value is relevant for the assignment of Case.⁶⁵ This is obviously unsatisfactory as an explanation, and perhaps some alternative approach might be able to integrate the conflicting status of infinitival *to* with respect to Case assignment and strict subcategorization.

5.4 The pattern of infinitival complementation in Italian is parallel in certain respects to that observed with English gerunds and infinitives. Italian has two types of infinitival complement structures: those involving bare infinitives and those with infinitives that are preceded by the particle *di*. The status of *di* in Italian seems to be even closer to that of a dummy Case marker than its English counterpart *to*. In fact, it is this particle that is adjoined to NP objects in derived nominals by the Italian version of the rule of *of*-Insertion. Most verbs which take infinitival complements take *di*-infinitives; the possibility of taking a bare infinitival complement is limited to a lexically-defined class.

The bare infinitival complements behave in many respects like English gerunds. First, they must immediately follow the verb at D-structure; when the verb also takes an object NP (as in Object Control structures) the complement clause must be a *di*-infinitive:

- (128) a. Giorgio ama [studiare]
 Giorgio likes to study
- b. Giorgio preferisce [dormire nell'altra stanza]
 Giorgio prefers to sleep in the other room
- c. Mario ordino [a Luigi] [di andarsene]
 Mario ordered to Luigi of to go
 'Mario ordered Luigi to go'
- d. *Mario ordino [a Luigi] [andarsene]

This suggests that the governing verb assigns Case to a bare infinitive under adjacency, while a *di*-infinitive intrinsically satisfies (15') and is free to appear after other complements in \bar{V} . Similar conclusions can be drawn from derived nominal structures. When a verb takes a bare infinitival complement, *di*-Insertion must always apply in the corresponding derived nominal, just as with English gerunds:

- (129) a. desidero [partire]
 I want to leave
- b. [il desiderio di-[partire]]
 the desire of to leave
 'the desire to leave'
- c. *[il desiderio [partire]]

Of course no additional *di* is adjoined to a *di*-infinitive complement in a derived nominal, as we should expect if the *di*-infinitive intrinsically satisfies (15').

The distinction between bare infinitives and *di*-infinitives is also reflected in the Topicalization facts. A bare infinitival complement is free to topicalize, since the verb assigns Case to its trace at S-structure:

- (130) a. Penso che Giovanni preferisca andare a Pisa
I think that Giovanni will prefer to go to Pisa
b. Andare a Pisa, penso che Giovanni preferisca --
- (131) a. Penso che Maria oserebbe andare a Roma
I think that Maria would dare to go to Rome
b. Andare a Roma, penso che Maria oserebbe --

But topicalization of a *di*-infinitive complement is impossible, since the verb is unable to assign Case at S-structure to a position that is occupied by a *di*-infinitive at D-structure:

- (132) a. Penso che Giovanni spera di andare a Pisa
I think that Giovanni hopes [of] to go to Pisa
b. * (Di) andare a Pisa, penso che Giovanni spera --
- (133) a. Penso che Giovanni tentera di andarsene
I think that Giovanni tried [of] to go there
b. * (Di) andarsene, penso che Giovanni tentera --

Thus Italian *di*-infinitives share exactly the properties of English *to*-infinitives with respect to Case assignment. As noted previously, it is impossible to account for these facts by stipulating that the verbs which take *di*-infinitive complements just happen to be incompatible with Topicalization constructions. For instance *sperare* 'hope' in (132) is unable to assign Case to the trace of its infinitival object, despite the fact that it is free to assign Case to the trace of an NP object, as in (134):

- (134) a. Penso che Giovanni spera [una rapida partenza]
I think that Giovanni hopes (for) a rapid departure
b. [Una rapida partenze], penso che Giovanni spera [e]

Thus it seems that a verb's ability to assign Case to a particular complement position is directly dependent on whether it is occupied at D-structure by a *di*-infinitival complement.

On the basis of these facts, it is tempting to conclude that the *di*-infinitives correspond directly to English *to*-infinitives, while the bare infinitives correspond to gerunds. There are two reasons for rejecting this position, however. First, unlike English *to*, *di* does not have to appear on an infinitival relative clause, suggesting that it functions more like a dummy Case marker than like the head of the clause. Moreover, Italian bare infinitival relative clauses have a COMP position that can be lexically filled by a WH-phrase:⁶⁶

(135) [una ragazza [_S con cui [PRO ballare --]]]

This ought to be impossible if these were really equivalent to English gerunds. Recall that gerunds, unlike true infinitivals, lack the [+Tense] feature; this prevents them from having a clause-internal COMP position, even when they function as nominal modifiers in the constructions discussed in Chapter 1. A second reason for rejecting the direct analogy to the English gerund/infinitive contrast is that no verb subcategorizes for both bare infinitives and *di*-infinitives.⁶⁷ In other words, if a verb subcategorizes for an infinitival complement, it may either assign Case to the complement, or it may take a *di*-infinitive, but not both. This suggests that Italian *di*, unlike English *to*, is actually inserted by a lexically-triggered rule when it appears with an infinitival complement in \bar{V} . Further, it seems that when a verb triggers the adjunction of *di* to a complement, it loses its ability to assign Case to that complement.

If the distinction between bare infinitives and *di*-infinitives were categorial in nature, akin to the distinction between English gerunds and *to*-infinitives, we would not expect this kind of result; the verb's ability to take a complement of one categorial type should have no effect whatsoever on its ability to accept another.⁶⁸

There is one further phenomenon associated with Italian infinitival complements that is of some interest in the present context. As observed in Section 2, Italian does not allow adjacent sequences of infinitives in certain circumstances. Longobardi (1979) accounts for this in terms of the surface filter (25), repeated here:

(25) Double Infinitive Filter

* Vinf-1 - Vinf-2,

where Vinf-1 c-commands Vinf-2, but Vinf-2 does not c-command Vinf-1.

The effects of the Double Infinitive Filter are illustrated in (136):

- (136) a. Giorgio ama [studiare]
 Giorgio likes to study
- b. *Giorgio comincia ad [amare [studiare]]
 Giorgio begins to to like to study
 'Giorgio is beginning to like to study'
- c. *[Amare [studiare]] e una dote importante
 to like to study is an important gift

As Longobardi notes, the Italian filter bears a strong similarity to Ross's (1972) **Doubt-Ing* filter in English, which applies to sequences of adjacent gerunds and progressive participles. Both of these filters are troubling, however, from the perspective of the theory of acquisition, since it is generally accepted that negative evidence plays at most a peripheral role in language learning. But negative filters are only

instantiated in terms of negative data; hence, from the viewpoint of acquisition theory, language-particular filters are suspect.

Unfortunately, however, it is a simple fact that many languages -- including French and English -- allow sequences of adjacent infinitives:

- (137) a. John intends [to try][to win the race]
 b. Janice is unlikely [to want][to drink this concoction]

- (138) a. Il est stupide d' [esperer][voir Marie]
 It is stupid (of) to hope to see Marie
 b. Jean croyait [voulait][voir Marie]
 Jean believed to want to see Marie
 'Jean thought he wanted to see Marie'

In each case, the infinitival sequences in (137-138) should be subject to the Double Infinitive filter, as formulated in (25); hence if the filter is to be generalized to other languages, some refinement is required.

The distinction between bare infinitives and *di*-infinitives with respect to Case assignment provides a way to solve this dilemma. In all of the structures where the filter applies in Italian, the first infinitive not only c-commands the second, but also governs and assigns Case to it. In fact, Longobardi notes that when *Vinf-2* is a *di*-infinitive complement, the filter is inapplicable:

- (139) a. Giovanni vuole [cercare] *di*-[eliminare] i rischi
 Giovanni wants to try (of) to eliminate the risks
 b. Mario puo [sperare] [di superare] la prova
 Mario can hope (of) to pass the test

In other words, if we take the Italian bare infinitives to be parallel to English gerunds, and the *di*-infinitives to be parallel to English *to*-infinitives (at least with respect to Case assignment by a governing verb) then the inapplicability of the filter in (139) is parallel to its non-application in (137). Suppose then that that we restate the filter

as (140):

(140) * $V_{inf-1} \dots V_{inf-2}$

where V_{inf-1} assigns Case to V_{inf-2} .

It is not necessary for the filter to stipulate that the verbs are adjacent, since this follows from the adjacency condition on Case assignment. This derives Longobardi's observation that intervening manner adverbials are "invisible" to the filter: since Case is assigned on the Argument Projection, the examples in (26) above are subject to the effects of the filter in exactly the same way.

In order for (140) to cover the English gerunds and progressive participles, we must understand the definition of "infinitive" somewhat differently from its conventional usage for the purpose of determining the applicability of the filter. Specifically, we can take the definition of V_{inf} to be a lexical head bearing the features [+V, -N], but without the features for [+Past]. Then (140) will apply to English gerunds and progressive participles, as well as to Italian bare infinitives. English to-infinitives and Italian *di*-infinitives will be unaffected, since they are not assigned Case by a governing verb.⁶⁹ Verbs in tensed clauses are also unaffected by (140), provided that the filter applies in the phonological component of the grammar, consistent with the assumptions of Longobardi (1979) and Chomsky and Lasnik (1977). Thus regardless of whether the [+Past] features are added to the verbal matrix in the morphological, phonological, or syntactic component, they are present at the level relevant for (140). The filter can be assumed to hold in Universal Grammar.⁷⁰

Actually, the grammaticality of the French examples in (138) is problematic. French infinitives seem to share certain essential properties with their Italian counterparts; nevertheless they are apparently immune to Filter (140). Specifically, French infinitival complements are normally preceded by the particle *de* unless they immediately follow a governing verb or preposition. The adjacency requirement on bare infinitival complements of course suggests that they are assigned Case by a governing verb. Moreover, when a verb takes a bare infinitival complement, *de*-insertion is required in the corresponding derived nominal. (The Topicalization test is unavailable because Topic constructions comparable to those in English and Italian do not exist in French.) The fact that the infinitival sequences in (138) appear to violate even the revised version of (140) suggests that some further refinement is needed. I will leave this as an unresolved problem.⁷¹

5.5 This concludes our discussion of infinitival complement structures. We have seen that *to*-infinitivals, like tensed clauses, differ from NPs and gerunds in being subject to the effects of the Case Resistance Principle. But infinitivals differ significantly from tensed clauses as well, in that they are intrinsically capable of satisfying Condition (15') when they appear as subcategorized complements. Unlike tensed clause complements, infinitives may never move from \bar{V} to a non-A-position, because no governing verb is able to assign Case to a position occupied at D-structure by a PP or *to*-infinitive. The inability of a verb to assign Case to a -infinitive rules out Passive constructions corresponding to a wide range of infinitival complement structures. On the other hand, *to*-infinitives are free to appear after other complements in \bar{V} at D-structure, and may also appear as complements of derived nominals, without being dependent upon the application of

of-Insertion.

Although the basic facts of Case assignment to infinitival complements are fairly clear, it is much less obvious that the specific means by which we have derived the lack of Case assignment to infinitival clauses is in any sense definitive. It seems that it is necessary to assume that the verb's ability to assign Case to a particular complement position is determined at D-structure, even though Case is not actually assigned until S-structure. Likewise, it seems that passive complement structures are "checked" at D-structure in an analogous fashion. Both of these conclusions seem rather strange, and the fact that they are apparently necessary suggests that some important aspect of the puzzle of infinitival complementation remains unsolved. Within the general framework assumed here, the only obvious alternative would be to encode the Case assignment properties on the subcategorization frames themselves, and this would entail giving up the assumption that infinitival clauses and tensed clauses form a natural class with respect to strict subcategorization. In addition, the status of infinitival *to* is problematic. In many ways, it appears to behave like a dummy Case marker, similar to its Italian counterpart *di*. But there are problems with this assumption, suggesting that *to* may actually be the head of the clause. This results in additional complications with respect to strict subcategorization, however, and some integration of these apparently conflicting conclusions seems to be required.

6. Exceptional Case Marking

6.1 In the preceding discussion, we have seen that various types of complements have distinctive patterns of distribution in VP that are determined for the most part by the interaction of the principles of Case Theory with the principles that govern θ -role assignment. With active verbs, an NP, gerund, or tensed clause must appear adjacent to the verb at D-structure, so that either it or its trace can be assigned Case at S-structure, as required by the conditions governing θ -role assignment. Infinitival complements, like PPs, may appear anywhere in \bar{V} , since they are not dependent upon Case assignment from the verb in order for θ -role assignment to proceed.

Some of the facts about constituent order that we have discussed would be possible to state in the form of ordered terms in the expansion of the categorial rules for \bar{V} , \bar{N} , \bar{P} , and \bar{A} , although it would be necessary to distinguish between infinitival \bar{S} and tensed clause (finite) \bar{S} in order to account for the relevant differences in order. But we have permitted the Case assigning properties of individual verbs to distinguish between tensed and infinitival complements, so it might be argued that the Case Theory account of constituent order has simply shifted the burden of explanation from one component of grammar to another, without any obvious gain.⁷² It is perhaps a natural reaction to view with suspicion the elaborate theory of Case and θ -role assignment employed here, which stands in contrast to the conceptually simple notation of the categorial component.

On the other hand, the machinery of the categorial component is virtually unused in many languages, and even in English its existence raises problems of explanatory adequacy. We shall now see that the Case Theory account of the order of subcategorized complements also has

advantages of descriptive adequacy over traditional accounts stated in terms of categorial rules, in that a number of apparently arbitrary deviations from the normal patterns of constituent order can be traced through the deductive structure of the theory to underlying causes which make some sense. The first such case involves the phenomenon of "Exceptional Case-Marking," whereby a verb assigns case to the subject of its infinitival complement.

Recall that infinitival clauses are unable to assign Case internally to their subjects unless the complementizer *for* appears in COMP:

- (141) a. [_S for [_S him - to be found with the gun]] would prove nothing
 b. John bought a dog [_S for [_S Mary to play with]]
- (142) a. *[Him to be found with the gun] would prove nothing
 b. *John bought a dog [Mary to play with]

The ungrammaticality of (142) can be attributed to a θ -criterion violation; since the Case is not assigned to the subject of the embedded infinitival clause, Condition (15') is not satisfied and the subject θ -role is not assigned. Now consider the sentences in (143):

- (143) a. I never expected [them - to return so soon]
 b. Paul discovered [the pills - to be powerful]
 c. Jim exposed [Susan - to be a liar]

These sentences are grammatical, implying that the θ -criterion is satisfied. Therefore Case must be assigned to the subject position in the infinitival clause in some way.

The available evidence suggests that it is the matrix verb that is responsible for assigning Case in this context.⁷³ First of all, the embedded subject must appear immediately next to the governing verb, suggesting the influence of the adjacency condition on Case assignment:

- (144) a. *I never expected - at all - [them to arrive so soon]
 b. *Paul discovered - by himself - [the pills to be powerful]
 c. *Jim exposed - to us - [Susan to be a liar]

Although the verb does not have to assign Case to the infinitival clause itself, the θ -criterion is violated if the embedded subject is not able to satisfy Condition (15'). Hence the clause must appear next to the verb so that its subject will satisfy the adjacency requirement on Case assignment.

Further evidence that the matrix verb is responsible for assigning Case to the infinitival subject position comes from the fact that passivization is possible:

- (145) a. [They]_i were never expected [[e]_i to return so soon]
 b. [The pills]_i were discovered [[e]_i to be powerful]
 c. [Susan]_i was exposed [[e]_i to be a liar]

Recall that a given strict subcategorization frame is only compatible with a passive participial head if the active verb from which the participle is derived can assign Case on the same subcategorization frame. For this reason, passive participles normally do not appear with infinitival complements at D-structure, unless there is an object NP as well. Nevertheless the Passive constructions in (145) are grammatical, suggesting that the corresponding verbs in (143) assign Case on the relevant subcategorization frame, presumably to the embedded subject.

Suppose that these conclusions are correct. Then the adjacency requirement on the entire clausal complement in (143-144) constitutes strong evidence for the Case Theory account of the order of complements in \bar{V} over the traditional account in terms of categorial rules. Normally, infinitival complements need not appear adjacent to the governing verb; but in exactly those structures where the embedded subject of the

complement clause is dependent upon Case assignment from the verb in order to satisfy Condition (15'), the entire clause must appear next to the verb too.

It is tempting to interpret the postverbal "subjects" of the embedded clauses as actually being the objects of the matrix verbs, along the lines of the traditional Raising-to-Object analysis of these constructions.⁷⁴ But it seems that the postverbal NP and the rest of the infinitival complement form a unit at S-structure, as shown by the fact that the clausal integrity of the complement does not allow other material in the matrix VP to intervene between the subject and the rest of the clause:⁷⁵

- (146) a. *I never expected them at all to arrive so soon
 b. *Paul discovered the pills by himself to be powerful
 c. *Jim exposed Susan to us to be a liar

Moreover, the Raising-to-Object analysis would violate the Projection Principle, as observed by Chomsky (1981).⁷⁶

6.2 Before considering in detail some of the theoretical implications of the possibility of Exceptional Case-marking, it is instructive to take a look at an analogous construction in Malagasy, which instantiates the same basic principles in a slightly different form. Travis (1981) observes that the basic constituent order in Malagasy is *Verb-Object-Subject* as in (147);

- (147) a. Manasa lamba Rabe
 wash-pres clothes Rabe
 'Rabe washes clothes'
 b. Mulaza izany an-dRabe Rakoto
 say-pres it to Rabe Rakoto
 'Rakoto says it to Rabe'

In our terms, this means that Malagasy maintains a distinction between the

\bar{X} and \bar{X} levels at S-structure. At the \bar{X} level, the language has taken the option of being left-headed, so that the verb appears at the beginning of VP, and the object appears adjacent to it so as to receive Case. At the \bar{X} level, the language has the marked property of placing its subject to the right of VP. (We might interpret this to mean that INFL appears to the right of VP, and so the subject appears there too in order to receive nominative Case under adjacency). When the direct object of the verb is a tensed clause rather than an NP, it normally appears to the right of the subject:

- (148) a. Milaza an-dRabe Rakoto [fa manasa lamba ny lehilahy]
 say+Pres to Rabe Rakoto COMP wash+Pres clothes the man
 'Rakoto says to Rabe that the man is washing clothes'
- b. Manantena Rabe [fa manasa lamba Rakoto]
 hope+Pres Rabe COMP wash+Pres clothes Rakoto
 'Rabe hopes that Rakoto is washing clothes'

We can interpret this as a straightforward CRP effect. The clause moves across the subject to a non-A-position at the end of S; in effect, this is a mirror-image of the English Topic structure. From this position, it binds its trace, which appears adjacent to the verb, where it is assigned Case and θ -role.

In addition to tensed clause complements such as those in (148), Travis observes that Malagasy has another clausal complement type which behaves like an English infinitival clause. The verb in this complement type has the same "tense" marker as that which appears on the finite clauses in (148). But these clauses may never assign Case to their subjects; instead, they normally take PRO subjects, suggesting that the subject position is ungoverned, just as in an English or Italian infinitive:

- (149) a. [_S [_{VP} Namporisika an-dRaso_a₁ [PRO_i hampianatra]] Rabe]
 urge-past obj-Raso_a₁ teach-fut Rabe
 'Rabe urged Raso_a to teach'

- b. [_S [_{VP} Nanaiky [_{PRO}_i handeha]] izy_i]
 agree-past go-fut he
 'He agree to go'
- c. * [_S [_{VP} Nanaiky [(an-d)Rabe handeha]] izy]
 agree-past(obj-)Rabe go-fut he
 'He agree for Rabe to go'

Travis observes, following Keenan (1976), that these clausal complements also appear in Raising constructions analogous to those involving English *seem*, *appear*, etc., suggesting that the clause is subject to \bar{S} -deletion, allowing a matrix verb to govern the complement subject position across \bar{S} .

The fact that these clauses behave exactly like infinitivals suggests that their "tense" markings are not grammatically equivalent to the English [₊ Past] feature, which permits the [₊Tense] head of \bar{S} to govern and assign nominative Case to the subject position. Perhaps the Malagasy "tense" marker should be interpreted as an aspectual marker analogous to the English perfect, except when it appears in the domain of a finite complementizer. It is also noteworthy that the clausal complements in (149) appear within \bar{V} , suggesting either that they intrinsically satisfy (15') or that they may be assigned Case by a governing verb in some way.⁷⁷

Malagasy also has a construction that is roughly equivalent to the English Exceptional Case-marking construction:

- (150) a. Manantena [_S an-dRakoto ho [manasa lamba]] Rabe
 hope+pres obj-Rakoto Prt wash+pres clothes Rabe
 'Rabe hopes that Rakoto is washing the clothes'
- b. Manantena [_S vehivahy maro ho miasa] Rabe
 hope+pres women many Prt work
 'Rabe hopes that many women work'

In (150), the subject of the embedded clause is assigned objective Case; this is only possible if the complementizer *fa* is absent. Instead, the particle *ho* appears in the position following the subject. We will consider the status of this particle shortly.

It is clear that the verb is assigning Case to the subject position of the complement clause in (150), since the adjacency requirement is met, and the obligatory absence of the complementizer *fa* suggests the need for \bar{S} -deletion so as to permit government across S. Moreover, passive versions of these structures are possible, indicating that the verb must be assigning Case in the corresponding active construction:

- (151) a. Antenain -dRabe [[e]_i ho nanasa lamba] [ny lehilahy]_i
hope-pres-pass by Rabe Prt wash-pres clothes the man
'the man is hoped by Rabe to have washed the clothes'
- b. Antenain -dRabe [[[e]_i ho nanasa lamba]] ve [ny lehilahy]_i
QUEST

In (151), the D-structure subject of the complement clause appears in the matrix subject position at S-structure. (This is confirmed by the question particle in (151b), which always precedes the subject position). The grammaticality of (151) also shows that the ECP is satisfied, implying that the matrix verb governs the complement subject position--presumably via \bar{S} -deletion, as is required independently in (150) to permit Case assignment across S.

The structure in (150) is of particular interest in that the subject of the clause appears to the left of VP, rather than to its right, as in the finite clauses in (147-149). This follows immediately from the fact that the subject of the complement is assigned Case by the governing verb, rather than by head of the clause itself. This forces the subject to appear immediately to the right of the verb, by virtue of the adjacency requirement on Case assignment, thus permuting the normal order of constituents in a way that is never evident in a language such as English, where the subject appears before VP at D-structure. We might think of this construction as a kind of mirror-image of subject inversion structures in English and Italian, forced in this case by the adjacency requirement

on Case assignment.

It has been suggested that the Malagasy construction in (150) should be interpreted as a structure of Subject-to-Object Raising, since the subject of the complement clause appears to move over a complementizer (i.e. the particle *ho*).⁷⁹ But this argument is dependent upon the assumption that *ho* is a complementizer. Suppose instead that *ho* is a rough equivalent of English *to*. (This is supported by the fact that *ho*, like *to*, appears independently as a dummy Case-marker for indirect object NPs). Since *ho* only appears in these constructions, there is no solid evidence for its status as a complementizer, as there is for English *for*. Moreover, the grammaticality of the sentences in (151) suggests that *ho* is not a complementizer; if it were, it ought to block proper government of the trace in the subject position of the complement in the passive structures in (151). (See Kayne, to appear b, for an analogous discussion of French *de*).

6.3 The possibility of Exceptional Case-marking constructions raises an interesting problem for the theory of objective Case assignment and its relationship to strict subcategorization. In general, a verb is only permitted to assign Case to a subcategorized position of a specified categorial type, as shown by the Topicalization facts. But if strict subcategorization features are directly linked to slots on a θ -grid, then a verb should only be permitted to assign Case to a complement to which it also assigns a θ -role. Clearly, the embedded subjects in Exceptional Case-marking constructions are not assigned any θ -role by the governing verb; the only θ -role assigned by the verb is the propositional object θ -role that is assigned to the infinitival complement as a whole. Now,

then, is Case assignment possible in these structures?

A possible solution to this problem would be to slightly revise our conception of how strict subcategorization requirements are satisfied at D-structure. Specifically, suppose that the strict subcategorization requirements for a given verb can be satisfied by any category appearing within the domain of government of the verb in \bar{X} . Suppose further that the lexically-triggered rule of \bar{S} -deletion applies at the level of D-structure; then the verb would govern the NP subject of the embedded clause at the level where subcategorization is checked. Now Chomsky has observed (MIT lectures, 1978) that the only verbs which permit Exceptional Case-marking are those which independently assign Case to a subcategorized NP complement. If we combine this observation with the assumption that strict subcategorization features can be satisfied by any category within the verb's domain of government, then we can assume that in Exceptional Case-marking constructions the verb is actually making use of a subcategorization frame for an NP complement. To put it another way, the verb is being "fooled" by the output of \bar{S} -deletion; despite the fact that an infinitival clause appears as the only complement in \bar{V} at D-structure, its NP subject is governed by the verb, and the structure is therefore able to satisfy the strict subcategorization requirements for NP. Since nothing prevents a verb from assigning Case to a subcategorized NP position, Case assignment is possible in (150).

Recall, however, that strict subcategorization features are linked to specific θ -roles that are associated with slots in the θ -grid. This means that if Exceptional Case-marking constructions make crucial use of subcategorization features for NP, then these features will determine the nature of the θ -role that is assigned to the complement of the verb

at LF. The clausal structure of the infinitival complement at S-structure will be mapped into a propositional configuration at LF. This implies that the θ -role that is assigned to the slot in the θ -grid associated with the NP subcategorization features ought to be compatible with a propositional object. In other words, our theory of Exceptional Case-marking combines with the theory of strict subcategorization proposed in Chapter 1 to predict that all Exceptional Case-marking verbs should be able to occur with NP objects that denote propositional content. (Such NPs are "concealed propositions" in the terminology of Grimshaw, 1977). In general, this prediction appears to be borne out:

- (152) a. I never expected [their immediate return]
 b. Paul discovered [the pills' power]
 c. Jim exposed [Susan's dishonesty]

This pattern is representative of most of the verbs in this class, but there are a few exceptions, some of them systematic, suggesting that some additional factor may be involved.⁸⁰ A thorough working-out of these issues goes beyond the scope of this study, but we will return to it briefly in our discussion of "small clause" complementation structures in Chapter 4. Our primary concern in this section has been to show the principled basis for the adjacency requirement on infinitival complements in this construction, and this seems to be fairly well established.

7. Tensed Clause Complements in NP and AP

7.1 According to the theory of Case and θ -role assignment to \bar{S} complements developed in Sections 4 and 5, there is a fundamental distinction between infinitival and tensed clauses with respect to Case assignment. When a verb subcategorizes for a tensed clause object, the verb assigns Case to object position at S-structure, even though the clause itself must

move out of this position so as not to violate the CRP. On the other hand, no verb ever assigns Case to a position which is occupied at D-structure by a *to*-infinitival complement. This distinction is reflected in a number of differences between the two complement types, including the possibility of Topic and Passive constructions, as well as the freedom of order in \bar{V} .

In addition, infinitival complements are free to appear as complements of derived nominals, without having to depend on any rules of dummy Case-marker insertion, unlike gerunds. So far, I have not explicitly discussed tensed clause complements to derived nominals. However, the prediction of the theory is fairly clear: no derived nominal should be able to assign a θ -role directly to a tensed clause complement. The clause is unable to intrinsically satisfy Condition (15'), but it cannot be assigned Case, due to the CRP. The CRP thus prevents *of*-Insertion from applying to the clausal complement itself; the only possible derivation that could conceivably satisfy the θ -criterion and the CRP simultaneously would be for the complement to move to a non-A-position, leaving its trace to function as a variable, as in the structures where the clause appears as a complement to a verb. Then *of*-Insertion would apply so as to assign Case to the trace, permitting it to satisfy (15'):

- (153) a. * $[_{NP}$ John's [$[_{\bar{N}}$ claim of- $[e]_1$] [that he would win] $_1$]]
 b. * $[_{NP}$ Paul's [[explanation of- $[e]_1$] [that he was temporarily insane] $_1$]]

But these NPs are ungrammatical. There are various possible explanations for this. The most plausible account is that the dummy preposition prevents the derived nominal from properly governing the trace of \bar{S} . This would then result in an ECP violation, if prepositions are not proper governors, as suggested by Kayne (1981).

Although the NPs in (153) are ungrammatical, the corresponding complement structures where *of*-Insertion has not applied are fine:

- (154) a. Andrea guessed $[e]_i$ [that Bill was lying] $_i$
 b. John claimed $[e]_i$ [that he would win] $_i$
 c. Paul explained $[e]_i$ [that he was temporarily insane] $_i$
- (155) a. [Andrea's guess [that Bill was lying]]
 b. [John's claim [that he would win]]
 c. [Paul's explanation [that he was temporarily insane]]

At first blush, the derived nominal phrases in (155) appear to be direct counterevidence to the theory of θ -role assignment to tensed clauses presented in Section 4. In fact, it was structures such as these that led Chomsky (1981) to conclude that the theory of θ -role assignment to Case-marked A-chains could not be extended to cover θ -role assignment to \bar{S} as well.⁸¹

However, a closer examination of the derived nominals in (155) reveals that they actually embody a striking confirmation of the theory of θ -role assignment to \bar{S} developed here. We have adopted Vergnaud's proposal that nouns may never assign Case; this prevents a derived nominal from assigning a θ -role to the Case-marked trace of a clausal complement. Therefore we might expect the derived nominal phrases in (155) to violate the θ -criterion. But this is true only if the derived nominal heads in these structures have the meanings of predicates which assign θ -roles to their complements, parallel to the verbs in (154) from which they are derived. Significantly, a careful consideration of the derived nominals in (155) shows that this is not the case. To see this clearly, it is worth contrasting the derived nominal phrases in (155) with those involving infinitival complements:

- (156) a. Jack attempted [to finish on time]
 b. John pretended [to be my friend]
 c. Jim refused [to go swimming]
- (157) a. [Jack's attempt [to finish on time]]
 b. [John's pretense [to be my friend]]
 c. [Jim's refusal [to go swimming]]

The derived nominals in (157) are "action" nominals, in the terminology of Lees (1960). Like other predicates, they denote an action or event, and the relation of the derived nominal to its infinitival complement is exactly the same as the relation between the corresponding verb and its infinitival complement: thematic role assignment to an object. But this is simply not true for the derived nominals in (155). The relation between the derived nominal and its tensed clause "complement" in (155) is in no sense parallel to the relation between the corresponding verb and its complement in (154). The derived nominals *guess*, *claim*, and *explanation* do not refer to the action of guessing, claiming, or explaining something, as is true for the verbs upon which they are based. A *claim* refers to thing which is claimed, rather than to the act of claiming; similarly for *guess* and *explanation*. Thus the derived nominal heads actually refer to the same thing that their "complements" do: the object argument of the verb. The relation between the derived nominal and its "complement" is actually one of apposition, rather than of θ -role assignment.

This intuition is confirmed by the fact that the identity relation holds between the pair (derived nominal, tensed clause complement):

- (158) a. [Andrea's guess] was [that Bill was lying]
 b. [John's claim] was [that he would win]
 c. [Paul's explanation] was [that he was temporarily insane]

This is impossible where the derived nominal is an action nominal which assigns a θ -role to its complement -- as in (157), where the pair (derived nominal, infinitival complement) are not in apposition:⁸²

- (159) a. ??[Jack's attempt] was [to finish on time]
 b. *[John's pretense] was [to be my friend]
 c. *[Jim's refusal] was [to go swimming]

Only when the derived nominal denotes the same proposition as its clausal complement is the identity relation possible.

The contrast between the two types of complement structures can also be illustrated by the fact that one can witness the events denoted by the action nominals in (157), but it is impossible to "witness" the propositions that are denoted by the nominals in (155):

- (160) a. John witnessed [Jack's attempt to finish on time]
 b. I witnessed [Jim's refusal to go swimming]
 (161) a. *Bill witnessed [John's claim that he would win]
 b. *I witnessed [Paul's explanation that he was temporarily insane]

If we replace the derived nominals of (161) with gerunds, the problem is eliminated:

- (162) a. Bill witnessed [John's claiming [that he would win]]
 b. I witnessed [Paul's explaining [that he was temporarily insane]]

In (162), the verb is able to assign Case to the trace of the \bar{S} complement, thereby enabling θ -role assignment to proceed.

Thus it turns out that the derived nominal constructions in (155), which at first glance suggest that tensed clause complements may be assigned a θ -role quite independent of Case assignment, actually conform to the claim that θ -roles can only be assigned to arguments that satisfy Condition (15').

It is perhaps worth reflecting briefly on the significance of this observation in the context of language acquisition. The distinction between the logically possible meanings of the derived nominals in (155) and their actual meanings is rather subtle. In most contexts, it would be impossible to conclude on the basis of direct evidence which of these meanings was intended. For instance, consider (163):

- (163) a. We object to [John's claim that Bill is a fool]
 b. Did you hear about [John's claim that Bill is a fool]?
 c. [John's claim that Bill is a fool] surprised everyone

There is no logical reason for a child to assume, on hearing sentences like (163), that the derived nominal does not refer to John's action of claiming that Bill is a fool. In fact, if generalization by analogy plays any role in acquisition, we would expect that the child's first hypothesis should be that the derived nominal does refer to an action, since the derived nominal's complement structure is directly analogous to that of the verb. Moreover, action-denoting nominals are very common, and are perhaps the unmarked case for derived nominals elsewhere. It is hard to imagine what kind of negative evidence could lead the child to conclude, on a case-by-case basis, that every derived nominal which takes a tensed clause complement cannot denote an action. At most, we would expect the possibility of ambiguity of meaning on the basis of positive evidence, as seems to be true for some of the derived nominals which take infinitival complements. But somehow, the language-learner knows that this logically possible meaning is not grammatically possible. How does this knowledge arise? What is the basis of this refusal to make an obvious inductive generalization? It is reasonable to conclude that the language acquisition device implicitly "knows" (164):

- (164) A derived nominal taking a tensed clause complement must be in apposition with that complement.

But given the θ -criterion, (164) can be deduced from (165):

- (165) No derived nominal assigns a θ -role to a tensed clause complement.

And (165), as we have seen, follows from the interaction of Condition (15') with the theory of Case assignment, which limits the ability to assign Case to lexical heads bearing the categorial features [-N] or [+Tense].

7.2 Let us now take a brief look at adjectival complement structures.

Consider the sentences in (166):

- (166) a. Mary is happy that Charles is leaving home
 b. Kevin is certain that the tent is in the car
 c. Neil is afraid that the computer will break down

Unless we are prepared to give up the assumption that adjectives do not assign Case, it seems fairly clear that the adjectives in (166) cannot be assigning a θ -role to a well-formed A-chain as we have defined it above.

It is tempting to propose that the θ -role is assigned here by virtue of a rule of Verb-Adjective Reanalysis, analogous to rules of Verb-Preposition Reanalysis that have been proposed for preposition stranding constructions.⁸³ Then *be happy*, *be certain*, *be afraid*, etc. would form complex verbs which could assign Case to the trace of the tensed clause, as in the previous examples. But this proposal, although appealing, does not seem to be workable. First of all, it wrongly predicts that bare NP complements should be possible, where the adjective subcategorizes for an NP complement:

- (167) a. Kevin is [certain of Ray's genius]
 b. Neil is [afraid of Constable O'Malley]

- (168) a. *Kevin [is certain] Ray's genius
 b. *Neil [is afraid] Constable O'Malley

Second, complex APs containing tensed clause complements behave as a constituent with respect to WH-movement, which should be impossible if V-A Reanalysis is necessary for Case assignment:

- (169) a. [How happy that Charles is leaving] do you think Mary really is--?
 b. [How certain that the tent is in the car] does Kevin appear to be--?

Third, "reduced" relative clauses consisting of just a complex AP with no governing verb can take tensed clausal complements:

- (170) a. John, aware that his mother was ill, decided to return home
 b. Andrew, certain that Paul was mistaken, checked the machine

Clearly, V-A Reanalysis is unavailable in these examples. These considerations show that a Reanalysis approach is unable to account for more than a subset of the relevant cases.

How, then, should these structures be accounted for? It seems that this type of exceptional θ -role assignment is limited to a few predicates denoting psychological states: *aware*, *happy*, *afraid*, *certain*, etc. Rather than discard the theory of θ -role assignment to A-chains that satisfy (15') -- a theory which has proved remarkably adequate in accounting for a wide range of facts concerning clausal complementation structures -- it seems reasonable to conclude that these psychological-state-denoting adjectives have a special property that excludes them from the general requirement that θ -roles can only be assigned to A-chains meeting (15'). Suppose, then, that the adjective phrases in (166-170) instantiate a special case of θ -role assignment, which is limited to relations of aware-

ness or recognition of the propositional content of a complement clause. Suppose further that this special case of θ -role assignment is triggered by a special lexical property of the adjective, which we can interpret as a feature -- call it [+R]. Then we can formulate special rule of θ -role assignment for this lexical class:

(171) θ -role Assignment by Recognition

In the configuration [γ α ... β], α can assign a θ -role P to β , where

- (i) α has the lexical feature [+R], and
- (ii) P is the θ -role of PROPOSITIONAL OBJECT, and
- (iii) β is a clause, and
- (iv) β is a subcategorized complement of α , and
- (v) $\gamma = \bar{\alpha}$

Let us refer to this special instance of θ -role assignment as Recognition; thus we can say that the adjectives in (166-170) recognize their complements.

I have suggested that this special rule of θ -role assignment is triggered by a lexical property of the adjective. If this is correct, then we might expect that derived nominals based on adjectives bearing the feature [+R] should share this lexical feature, given the "Remarks" theory of the lexicon. Since θ -role assignment in (171) is not restricted by Condition (15'), the fact that derived nominals are unable to assign Case should have no effect on their ability to recognize tensed clause complements, if they bear the lexical feature [+R]. This appears to be correct:

- (172) a. I was surprised at [Mary's happiness that Charles is leaving]
 b. [Kevin's certainty that the tent is in the car] is not reassuring
 c. [Bill's awareness that his mother was ill] was unfortunate

The nominal heads in these structures are derived from the adjective *happy*, *certain*, and *aware*, all of which belong to the [+R] class.

Unlike the derived nominals considered in Section 7.1 the relation holding between a derived nominal head and its tensed clause complement in (172) is directly parallel to the relation holding between a [+R] adjective and its complement. These nominals do not bear the identity relation with their complements, but rather refer to the psychological state denoted by the corresponding adjective (cf. 158, 159):

- (173) a. *[Bill's happiness] is [that Charles was leaving]
 b. *[Bill's awareness] was [that his mother was ill]

The exceptional behavior of the nominals in (173) supports the hypothesis that the special rule of θ -role assignment by Recognition in (171) is triggered by a specific lexical property that is stated just once for the complete lexical entry. Moreover, the status of the derived nominals in (172) also provides support for the claim that the theorem in (164) should be derived from the principles of Case and θ -role assignment developed above, since in just those cases where Condition (15') is circumvented by a special lexical property, (164) does not hold.

There is another consequence of the hypothesis that the adjectives in (166) assign a θ -role to their complements by a special rule such as (171), rather than through the normal strategy of θ -role assignment to A-chains meeting Condition (15'). Since the adjectives in these structures are unable to assign Case, topicalization of the complement clause should be impossible. This turns out to be correct:

- (174) a. *[That Charles is leaving], I believe that Mary is [happy --]
 b. *[That the computer will break down], I know that Neil is [afraid--]

Since the trace is not assigned Case, Condition (15') blocks the normal strategy of θ -role assignment to A-chains. The special rule of θ -role assignment by Recognition is inapplicable, since it only applies when the clausal complement appears in the complement phrase of the [+R] head. The ungrammaticality of (174) cannot be attributed to the fact that these adjective phrases are islands for movement, since PP complement structures that are not dependent upon θ -role assignment by Recognition allow Topicalization:

- (175) a. [Her brother's departure], I believe that Mary is [happy
about --]
b. [That policeman], I think that Neil is [afraid of --]

Thus it seems that the ungrammaticality of (174) does in fact follow from the fact that the clausal complements of the [+R] adjectives are assigned their respective θ -roles by an independent rule that is not sensitive to (15'), but which is restricted with respect to Topicalization because it is not integrated into the general system of θ -role assignment to A-chains.

Although the adjectival complement structures discussed in this section deviate from the general pattern of θ -role assignment to Case-marked A-chains, they do not provide evidence against the theory developed here, since their exceptionality can plausibly be traced to a specific lexical property. In fact, these constructions actually provide evidence for the theory, since the pattern of deviation caused by this lexical property has systematic effects in related constructions, which can be deduced from the interaction of the relevant grammatical principles.

8. Some Further Interactions

8.1 The CRP prevents a tensed clause from being assigned Case, and Condition (15') only allows θ -role assignment to an A-chain that is headed

by a Case-marked position. Therefore a tensed clause complement of an active verb must move to a non-A-position, leaving its trace to function as the argument to which Case and θ -role are assigned. The clause must immediately follow the verb at D-structure, so that its trace will appear adjacent to the verb at S-structure, where it can be assigned Case:

- (176) a. I said $[e]_i$ to Jim [that I would buy the guitar] $_i$
 b. Andrew will disclose $[e]_i$ to the audience [that he is married] $_i$
 c. David admitted $[e]_i$ to Barry [that he had burnt the toast] $_i$

Kuno (1973) cites J. Aissen's observation that preposition stranding in such contexts is ungrammatical:

- (177) a. $*[Who]_j$ did you say to $[e]_j$ that I would buy the guitar?
 b. $*[Who]_j$ will Andrew disclose to $[e]_j$ that he is married?
 c. $*[Barry]_j$, David admitted to $[e]_j$ that he had burnt the toast

The pied-piped versions of these sentences are grammatical, however:

- (178) a. To whom did you say that I would buy the guitar?
 b. To whom will Andrew disclose that he is married?
 c. To Barry, David admitted that he had burnt the toast

Moreover, stranding is perfectly acceptable if the object of the verb is an NP instead of a tensed clause:

- (179) a. $[Who]_j$ did you say a few words to $[e]_j$?
 b. $[Who]_j$ will Andrew disclose his marriage to $[e]_j$?
 c. $[Barry]_j$, David admitted his error to $[e]_j$

These facts are just what we should expect, given the theory of θ -role assignment to complement clauses developed here, provided that we assume, with Weinberg and Hornstein (1981), that preposition stranding is only possible if the preposition is reanalyzed as part of a governing verb. (This assumption is defended at considerable length in Chapter 7 below).

Let us assume, following Kayne (1981), that V-P Reanalysis is necessary in stranding constructions because prepositions are not proper governors; this result may be derivable from the theory of θ -role assignment, as we shall see in Chapter 6. Then stranding is ungrammatical if Reanalysis does not apply, since the (improperly governed) trace violates the ECP.

After Reanalysis applies to the grammatical structures in (179), the derived configuration is that of (180):

- (180) a. NP_i [_S NP [_{VP} [_V V - NP - P] [_i] I]
 Who you said a few words to

In (180), the WH-word or Topicalized NP binds its trace [_i] as a variable. In order for θ -role assignment to be possible, the complex verb derived by Reanalysis must assign Case to the trace so as to satisfy Condition (15').

Now consider the structures in (177). These also involve preposition stranding; therefore the preposition must be reanalyzed as part of a complex verb. The trace of the NP which appears as the object of the preposition at D-structure must be assigned Case by the complex verb at S-structure. Therefore this trace must appear adjacent to the preposition. But this makes it impossible for the verb to assign a θ -role to the tensed clause complement which appears after the preposition. Suppose that the tensed clause appears in \bar{V} at S-structure. It will be unable to be assigned a θ -role, since it cannot be assigned Case without violating the CRP. Suppose instead that the clause is actually adjoined to the right of VP; then it will bind its trace in \bar{V} as a variable. But θ -role assignment is still blocked, since it is impossible for both traces to be simultaneously adjacent to the verb:

- (181) NP_i [_S NP [\bar{V} [\bar{V} [\bar{V} [_V V - P] [e]_i [e]_j]] \bar{S}_j]]
 Who you said to that-S

Notice that the situation is not helped at all if the clausal complement is generated adjacent to the verb at D-structure:

- (182) [_S NP [\bar{V} [\bar{V} V - \bar{S}_j - [_{PP}^P - NP_i]]]]

In order for preposition stranding to be possible, the preposition must be reanalyzed as part of the verb. Suppose that Reanalysis must apply at D-structure. Then, as Weinberg and Hornstein (1981) observe, movement of the direct object NP is impossible, since *Move α* cannot analyze a subpart of a word.⁸⁴ Suppose instead that Reanalysis applies freely at any point. Then the derivation is still ruled out, since the \bar{S} in the non-A-position must still bind a variable. But the variable finds itself within the structure of the derived word, so the structure is not one of proper binding.⁸⁵

Since infinitival complements are not dependent upon Case assignment from a governing verb, they do not have to leave a trace next to the verb in order for θ-role assignment to proceed. This means that preposition stranding ought to be perfectly compatible with infinitival complementation. We have already seen in Section 5 that PP complements rarely appear with infinitival complements in English, for some reason. Nevertheless, where they are possible, preposition stranding is too:

- (183) a. I pleaded [with John] [PRO to shut the door]
 b. We are counting [on Sally] [PRO to help us]
- (184) a. Who did you plead with -- to shut the door?
 b. Who are you counting on -- to help us?

The special properties of infinitival and tensed clause complementation thus derive a principled distinction with respect to stranding.

On the other hand, Heavy NP Shift constructions are grammatically equivalent to structures with postverbal tensed clause complements, so they should also be incompatible with preposition stranding in VP. In fact this is correct, as observed by Fodor (1978):

- (185) a. *Jim, I said to -- [a few words about his workmanship]
 b. *Who will Andrew disclose to -- [his impending marriage with Jane]?

Exactly the same situation obtains here as in the previous case: both the extraposed focussed NP and the Topic or WH-phrase must bind their respective traces in \bar{V} . But it is impossible for both of these traces to appear adjacent to the reanalyzed verb, and so Case assignment is blocked, resulting in a θ -criterion violation, due to Condition (15'). Thus the theory of Case and θ -role assignment discussed in the previous sections derives exactly the right result in these cases, treating the Focus NP Shift constructions and tensed clause complement structures exactly alike, as we expect.

It is interesting to contrast the stranding properties of the structures in (177) with their passive counterparts:

- (186) a. It was disclosed [by Andrew] [that the show would start on time]
 b. It has been reported [to the general] [that the battle is over]

Recall that in these structures, the tensed clause complement must originate in \bar{V} in order to satisfy the strict subcategorization requirements of the verbs from which they are derived. But in order for θ -role assignment to be possible, the clausal complements must first raise to subject position, after which they undergo *it*-Extraposition, deriving the structures in (186). The extraposed clause is then part of an A-chain which is headed by the pleonastic *it* in subject position, to which Case is assigned.

Of interest to the present discussion is the fact that postverbal PPs in these constructions are perfectly compatible with preposition stranding:

- (187) a. Who was it disclosed by -- [that the show would start on time]?
 b. Which general has it been reported to -- [that the battle is over]?

The contrast between these sentences and their active counterparts follows as a natural consequence of the way that Condition (15') is satisfied in each case. In the active sentences, the verb must assign Case to the trace of \bar{S} in \bar{V} , which is bound as a variable by the extraposed clause. In the passive constructions, however, participle does not assign Case to the trace of the clause; instead, the clause is part of a chain that is headed by the Case-marked pleonastic *it*. Therefore the passive construction does not require the clause to appear at D-structure in a position adjacent to the verb; instead, it can follow the PP. After WH-movement and reanalysis apply, the S-structure configuration will be that of (188):

- (188) a. $NP_k [{}_S \dots it_j^i [[[+V] V+en - P] [e]_k [e]_j] \bar{S}^i]]$
 Who was it disclosed by that-S

In (188), the complex participle derived by Reanalysis assigns Case to the WH-trace.⁸⁶ The trace of \bar{S} is A-bound by the pleonastic element in subject position, as required by the Binding Theory. Nothing requires the trace of \bar{S} to be assigned Case, so it is free to appear at the end of \bar{V} , unlike its counterpart in the active structure.

This contrast between active and passive structures provides an interesting confirmation of the theory of θ -role assignment to tensed clause complements developed above. But the contrast is also of special interest inasmuch as it shows that there can be no particular

fixed order of complements at D-structure. This conclusion follows from the fact that the \bar{S} complements in the passive structures in (187) must appear in a different position in \bar{V} from that occupied by the same complements in the active constructions in (176).

When an active verb subcategorizes for a tensed clause complement, the complement must appear next to the verb at D-structure, in order for the verb to assign Case to its trace at S-structure. But in passive structures, the clausal complement must be free to follow other complements of the verb at D-structure, or else the stranding constructions in (187) would be on par with their ungrammatical active counterparts.

This freedom of base order is exactly what we expect, if there are no categorial rules defining the order of complements; the constituents may appear in any order that is compatible with the abstract grammatical principles of Case Theory and θ -role assignment. On the other hand, this necessary freedom of order is incompatible with a theory which assumes that the order of complements is fixed at D-structure by the categorial component. Moreover, the situation is not any better for a theory which derives the order of constituents by means of phrase structure rules defining surface order. Such a theory would have to recapitulate the effects of movement in the active structures of tensed clause complements in the form of a null pronominal element adjacent to the verb. This would be a notational variant of the movement account -- except for the fact that it would take the form of an arbitrary stipulation, since in such a theory the principles of Case and θ -role assignment would be superfluous.

3.2 Another consequence of the theory of θ -role assignment to infinitives and tensed clauses developed here is that it provides a possible explanation for the principal effects of Ross's (1973) "Same Side Filter":

(189) The Same Side Filter

No surface structure can have both complements of
a bisentential verb on the same side of that verb.

This filter is intended primarily to derive two facts observed by Emonds (1970). First, topicalization of a tensed clause complement is incompatible with a sentential "subject:"

- (190) a. [That John owns the gun] proves [That Mary is innocent]
b. [For John to confess guilt] would prove [that you were lying]
- (191) a. *[That Mary is innocent], [that John owns the gun] proves --
b. *[That you were lying], [for John to confess guilt] would prove --

This effect of the filter follows from the fact that sentential "subjects" are really Topics at S-structure, as noted in Section 3. This follows from the CRP, which prevents a true \bar{S} from appearing in a position of Case assignment. Thus the ungrammaticality of (191) follows either from a CRP violation or from an improper movement of one of the clauses into a position other than COMP.⁸⁷

The second fact which this filter is intended to derive is that *it*-Extrapolation of the subject is incompatible with a clausal complement in VP:

- (192) a. *It proves [that Mary is innocent] [that John owns the gun]
b. *It would prove [that you were lying] [for John to confess guilt]

The ungrammaticality of (192) has been the subject of much discussion in the literature. Emonds (1976) attributes the contrast to a condition on Extrapolation that it be "structure preserving," in the sense that the clause which is extraposed from subject position must move to position at the end of VP which is specifically reserved for \bar{S} by the categorial rules of the base. According to this account, there is only one \bar{S} position in VP, so (192) is ruled out because the \bar{S} position is already occupied by

the clausal complement of *prove*. Koster (1978a), following Emonds (1970), adopts a similar account, differing only in that he assumes that the extra-posed "subject" clauses are generated in the \bar{S} position of VP at D-structure. Since two clauses cannot be generated in the same position, (192) is ruled out.

Emonds' and Koster's accounts are incompatible with the theory of grammar being developed here, since they both crucially depend on there being a categorial rule which defines exactly one position for \bar{S} in VP. Moreover, both accounts run into problems of descriptive adequacy, since they predict that sentences such as the following should be ungrammatical:

- (193) a. It proved [John to be guilty] [that he owned the gun]
 b. It would prove [John to be guilty] [for him to be found with the gun]

The same goes for the following structure, noted by Baltin (1978):

- (194) It is believed [to be obvious] by everybody [that Fred is crazy]

The structure noted by Baltin has a direct parallel with true Raising verbs as well, in the form of the structures in (85) and (86) above. In addition, there are certain other problems with these accounts.⁸⁸

The basic generalization which emerges from (192-194) is that subject extraposition is always possible, unless there is a tensed clause complement in the VP to which the subject adjoins. If the clausal complement is an infinitival, no problem arises. Recall that tensed clause complements, unlike infinitival complements, must move to a non-A-position adjoined to the right of VP. This suggests that the problem with the sentences in (192) is that *it*-Extraposition is impossible if some other category is also adjoined to the right of VP. This suspicion is confirmed by the fact that we find similar effects in Focus NP Shift constructions:

- (195) a. [That John was seen with the murder weapon]_i [e]_i proved [his guilt] [to the jury]
- b. [That John was seen with the murder weapon]_i [e]_i proved [e]_j [to the jury] [his guilt]_j
- c. It proved [his guilt] [to the jury] [that John was seen with the murder weapon]
- d. *It proved [e]_i [to the jury] [his guilt]_i [that John was seen with the murder weapon]
- e. **It proved [e]_j [to the jury] [that John was seen with the murder weapon] [his guilt]_i

Once again, the Focus NP Shift construction has the same formal grammatical properties as the tensed clause complement structure, as opposed to the infinitival complement structures. This is precisely what we should expect, given the theory of Case and θ -role assignment that we have assumed here.

It seems that the ungrammaticality of these sentences results from the fact that only one constituent may be adjoined to the right of VP, regardless of its categorial status. The *it*-Extraposition construction crucially involves VP-adjunction since the head of the chain must c-command the extraposed subject at S-structure.⁸⁹ The Focus NP Shift and tensed clause complement structures involve VP-adjunction so that the clause can bind its trace as a variable at S-structure. Apparently, only one of these options can be exercised in a given structure. This result appears to coincide with our observation in Section 4.4 that only one subcategorized constituent may be adjoined to the right of VP at S-structure; cf. (91).

There are a number of ways in which this result might be derived from the formal properties of grammar. The most plausible story is that the application of adjunction to a particular constituent "freezes" that constituent for the purposes of further adjunction, in the spirit of

Culicover and Wexler (1977). It is perhaps worth observing that not all speakers find these double-adjunction structures totally unacceptable, so the relevant condition may be peripheral to the grammatical system, and may actually represent a processing difficulty of some sort.⁹⁰

9. This concludes our discussion of the principles determining the order of complements within the \bar{X} level. Our concern here has been to work out in some detail a viable account of the order of NP, PP, and \bar{S} complements within various categorial phrases, so as to lend some plausibility to the claim that the Categorial component is unnecessary for the determination of the order of constituents within each level.

Apart from providing a basis for deriving constituent order at the \bar{X} level, the principles of Case and θ -role assignment invoked in this chapter lead to a number of insights into hitherto mysterious properties of clausal complement structures. As is common in this business, however, the new analyses developed here raise a few new problems that demand some sort of explanation. In particular, the properties of infinitival complements with respect to strict subcategorization and Case assignment appear to be somewhat contradictory, especially with respect to the particle *to*.

Actually, there are a number of complement structures that I have neglected in this chapter; some of these will be discussed in later chapters in the context of related analyses. In particular: Chapter 4 contains a discussion of the predicate complement position in VP; Chapter 5 provides a detailed analysis of Double Object and Verb-Particle constructions; Chapter 6 accounts for certain clausal complement structures that appear to violate the principles invoked in this chapter; and Chapter 7 is devoted to a long discussion of preposition stranding constructions.

FOOTNOTES: CHAPTER 3

1. The obligatory pied piping effect is attributed to a condition on Reanalysis in Chapter 7.

2. An alternative approach would be to follow Jackendoff (1977) in assuming a flat structure in \bar{V} , while defining the argument position adjacent to the verb as the direct object position. I will adopt neither of these approaches here; see Sections 2, 6, and 8 for discussion.

3. This filter does not apply to PRO or NP trace, which are not lexical in the sense relevant to (14) in the "On Binding" theory.

4. Chomsky's actual formulation is stated in terms of a condition on θ -role assignment to A-chains. See Section 3 for discussion.

5. Further below, the notion of "association" is made explicit, permitting a trace of NP-movement to be associated with the features of its antecedent under certain circumstances.

6. These conditions are stated by Freidin as follows:

(i) Functional Relatedness

In a sentence S_i , each lexical NP with nonnull semantic content must fill some argument position in the logical form of S_i .

(ii) Functional Uniqueness

In a sentence S_i , no lexical NP may fill more than one argument position for any given predicate in the logical form of S_i .

These combine to derive (16b); (16a) is the extension proposed by Chomsky.

See also Borer (1979) for discussion.

7. Kayne's (1975) generalization that clitic doubling is only possible if a dummy Case-marker is adjoined to the doubled NP no longer follows from (15/16),

as it did from the Case filter (14) under the assumption that clitics absorb Case features. Certain cases involving indirect objects may be amenable to an account stated in terms of (15/16) if two θ -roles are assigned to the indirect object, as suggested in Chapter 5. Similarly, the dummy subjects of weather verbs must be treated as "quasi-arguments" that are assigned a "quasi- θ -role" if their obligatory requirement for Case features is to be captured by (15/16). These considerations suggest that some aspects of the Case filter may have to be recaptured in some other form if (14) is to be dispensed with.

8. The rule of *of*-Insertion is discussed in greater detail in the Appendix to this chapter.

9. This definition of government is adapted from Aoun and Sportiche (forthcoming); see also Chomsky (1981). Note that (17) has no *c*-command requirement incorporated into it. The only case where this is necessary is in the case of proper government from COMP; I shall discuss this in detail in Chapter 6. (17ii) is intended to capture the fact that maximal projections are barriers to government. For some relevant discussion, see Chapter 4, Section 1. See also Reuland (1981b) for a different approach in terms of a principle blocking overlapping domains of government.

10. This rule is intended primarily to capture objective and oblique Case assignment. Nominative and genitive case may be structurally assigned; a discussion of the genitive rule appears in the Appendix to this chapter.

11. Even if the θ -role associated with the NP object may be assigned by the verb, as suggested below, it is the proposition that assigns Case under adjacency.

12. An interesting issue arises with respect to the categorial status of the phrase derived by *of*-Insertion. See Section 3 and Chomsky (1981) for discussion.

13. I am grateful to M.R. Manzini for helpful discussion about the Italian facts cited here. It seems that substantially the same facts hold in French.

14. M.R. Manzini brought the intonation facts to my attention.

15. Actually, the ill-formedness of (21) may follow independently from the assumption that time adverbials may not appear in \bar{V} , if only subcategorized material may appear at this level.

16. M.R. Manzini suggests an alternative account, according to which the manner adverbial is treated as part of the verbal complex in French and Italian. It seems, however, that the Argument Projection is also exploited in English by the rule of Reanalysis; see Chapter 7 for discussion.

17. Presumably this rule is dependent upon government of V_2 by V_1 . Interestingly, it seems that this type of rule must be distinguished from the Reanalysis rules, since it is not "structure preserving" in potential violation of a condition on Reanalysis proposed in Chapter 7.

18. On the link between clitics and A-positions, see Jaeggli (1980) and Borer (1981). See also Chapter 5 for relevant discussion.

19. Longobardi (1979) observes the connection between the Restructuring rule and his Double-Infinitive filter in terms of the abstract representation to which both rules seem to apply. In essence, I have adopted the basic idea of Longobardi's account.

20. The facts cited here are drawn from Koster (1978b). Thiersch (1978) reports similar facts in German.

21. I am grateful to M. Halle for pointing out the functional connection between the word-formation rule proposed here and the morphological affixes that take their place in other languages. The notion of discontinuous syntactic elements is exploited by Aoun (1979), who proposes a discontinuous VP in Arabic; similarly, Y. Aoun has suggested that COMP and INFL may form a discontinuous unit, an idea that I will adopt in Chapter 6. See also Chapter 4, Section 4 for related discussion concerning the English verbal complex.

22. One exception is the Subject-Auxiliary Inversion construction, which might be amenable to an analysis in terms of discontinuous constituents analogous to Dutch. See Chapter 4, Section 4.

23. I am grateful to Hilda Koopman for assistance with the Dutch examples. She informs me that many speakers find an alternative clitic order acceptable as well:

(1) iemand gaf - 'm - 't
 someone gave him it

There is an analogous alternation found in English; this is discussed in Chapter 5, Section 5.4.

24. For an alternative view, see Borer (1981), who exploits Emonds' (1976, 1981) Local Rules to derive properties of arbitrary order. Note that the locality property of these rules follows as a natural consequence of their status as word-formation rules -- abstracting away from the effects of the discontinuous head positions in languages such as Dutch.

25. In addition to Dutch, German and Warlpiri have cliticization to "second

position". It may be that in these languages, the second position corresponds to the INFL position in S, suggesting that INFL should be included in the discontinuous verbal complex. Presumably the position of INFL within the verbal complex is determined by principles of government, along lines analogous to the account proposed by Safir (1981a). This issue may also be of direct relevance to the formulation of the pro-drop parameter, if the position of INFL in the verbal complex is the determining factor, as suggested by Chomsky (1981).

26. In Preposition Stranding constructions, the preposition itself does not assign Case, since it is incorporated into the structure of a governing verb or participle.

27. For an alternative view, see Borer (1981), where it is suggested that rules inserting dummy Case-markers may also apply at D-structure.

28. Perhaps an analogous factoring applies with respect to Case assignment; this would distinguish between true syntactic Case and "Quirky Case" in languages such as Icelandic. Since Quirky Case is selected as a lexical property of the verb, it must appear on the NP argument at D-structure, within the domain of government of the verb, by virtue of the Projection Principle. Syntactic Case, on the other hand, could be assigned either cyclically or at S-structure (as is assumed here). See Levin (1981) for a discussion of the Icelandic facts and related issues.

29. (42) represents one version of the Binding Theory proposed by Chomsky (1981). It is later revised, so that "governing category" in (42a,b) is replaced by "binding category". The binding category of phrase is determined exclusively by reference to the accessible subject. This change means that the ungoverned status of PRO can no longer be derived from the formulation of the Binding

Theory itself; however, it still follows from an additional (independently necessary) assumption that the entire sentence is the binding category of any governed element. See Chomsky (1981, 220-1) for discussion; in addition, see fn. 74 below.

30. See Chomsky (1981) for discussion of this issue.

31. In a pro-drop language, PRO may appear as the subject of a tensed clause, perhaps because AGR (or INFL) appears within the matrix of the head of VP in these languages at S-structure; cf. Jaeggli (1980), Chomsky (1981).

32. Actually, PRO may appear in two other domains: in the COMP position of an infinitival relative clause, and as the subject of a small clause adjunct. These conclusions are dependent on a number of auxiliary assumptions, however; see Chapter 4 for discussion.

33. The definition of c-command is provided as (54) in Section 3.2.3.

34. Chomsky (1977) proposes an alternative analysis, according to which a Topic phrase controls a WH-phrase in the adjacent COMP, which has undergone (successive-cyclic) WH-movement. In terms of current assumptions, there is no clear-cut reason to assume that it is a WH-phrase that has moved through COMP, since WH-movement is subsumed under *Move α* . See Van Riemsdijk (1978a) and Section 5 below for arguments that the topicalized constituent itself appears at D-structure in the trace position; see also Steriade (1980).

35. First of all, the trace of Focus NP Shift is subject to the Empty Category Principle, which holds at the level of Logical Form:

- (i) [John]_i is believed [_S [e]_i to be very intelligent]
 I believe [_S [e]_i to be very intelligent [my good friend John]_i]

- (ii) $*[John]_1$ is wanted $[\bar{S} [S [e]_1$ to be very intelligent]]
 $*I$ want $[\bar{S} [S [e]_1$ to be very intelligent [my good friend John]]]

Second, if this is the same rule that is involved in the stylistically-motivated Presentational *there*-Insertion and PP-Preposing constructions, then it feeds the application of syntactic movement:

- (iii) $[There]_j$ appears $[S [e]_j^i$ to have arrived [an old man] i]
 (iv) $[In\ this\ room]_j$ $[S [e]_j$ is believed $[S [e]_j^i$ to have slept
 [the third president of France] i]]

Finally, Focus NP Shift constructions are subject to "Same Side Filter" effects and ECP effects in Preposition Stranding constructions, as I shall show in Section 8 of this chapter. In every respect, the construction has the properties that we would normally expect if it were derived by application of *Move α* .

36. G. Longobardi has argued in unpublished work that the pro-drop property of assigning nominative Case in postverbal position is responsible for a cluster of phenomena associated with "identificational" constructions, where no inversion is involved.

37. As formulated in (54), c-command is unable to "project" through the X-bar structure of a phrase; see Chapter 6 for a justification of this revision.

38. See Section 4.6 for discussion of the status of the postverbal subject position as an A-position. The solution to apparent Binding Theory violations adopted here differs from that proposed by Rizzi (1980), who proposes that the Binding Theory does not apply to a category that is bound from its θ -position. See also fn. 39.

39. Actually, it is not crucial to assume that the true subject position is the θ -position, since the position for the external (subject) θ -role may be left indeterminate. Then either the true subject position or the VP-adjoined

position might count as the θ -position, as I suggested in Stowell (to appear). If the VP-adjunction structure is not base-derived, then the subject must originate in the true subject position at D-structure, even though the VP-adjoined position might be interpreted as the θ -position at S-structure. This interpretation might be necessary if the definition of chains were tightened so as to require that every position on the chain c-command the θ -position, as is true in Raising and Passive constructions.

40. Note that an account stated in terms of phrase structure rules could not generalize straightforwardly to general principles operative in other languages with different constituent orders from those found in English.

41. I am grateful to D. Pesetsky for assistance with the Russian data. See Schein (1980) for a discussion of these constructions.

42. In Chapter 4, I will briefly discuss constructions involving complements to perception verbs, where VP appears to occur as a subcategorized argument.

43. A possible exception to this claim involves the constructions in (i):

- (i) [Under the stars] is a nice place to sleep
 Is [under the stars] a nice place to sleep?

These PP subjects appear to be strictly limited to copular constructions, suggesting that some special property of the copula permits nominative Case to be absorbed or assigned to the postverbal position. See also Chapter 4, Section 2.

44. If D-structure is a "pure" representation of θ -role assignment, as suggested by Chomsky (to appear), then true prepositions may differ from dummy Case-markers inasmuch as only true prepositions would appear at D-structure.

45. Recall that Condition (15') is related to Aoun's "visibility" hypothesis. I will occasionally refer to "visibility" in reference to (15'), especially in subsequent chapters. The structures in (63) actually have grammatical variants that may be derived by *it*-Extraposition, as suggested by Jackendoff (1977):

- (i) It seems to be very cold [in the room]
- (ii) ?It appears to have scared Bill [down in the mine shaft]

It is difficult to tell, however, whether these are true examples of extraposition, as opposed to simple adverbial modification.

46. Specifically, Reuland suggests that infinitival clauses are "visible" to the rules of Case assignment by virtue of their nominal features, but are "deficient" in being not able to bear the Case that is assigned to them. The status of tensed clauses is less clear in this system.

The idea that \bar{S} may not be assigned Case has also been explored by K. Safir in unpublished work. Safir suggests that neither \bar{S} nor \bar{S} -trace may be assigned case, thus deriving the fact that \bar{S} complements to Raising verbs may not be topicalized. (He suggests that where topicalization is possible, the \bar{S} Topic makes use of an NP-trace, which is only possible when the governing verb subcategorizes for NP; cf. Williams 1981.)

47. Emonds (1970) assumes that the rule substituting \bar{S} for the NP subject position of S is a root transformation. In Emonds (1976), it is suggested that all instances of \bar{S} must undergo either topicalization or extraposition; hence the sentence-initial instances of \bar{S} must be interpreted as Topic constructions. Koster (1978a) derives the "obligatory topicalization" effect by invoking principles of the X-bar system; we will return to his account below.

48. Strictly speaking, our assumption that the categorial component does not exist does not necessarily imply that the subject position of S is not specified as an NP position. For instance, one might maintain, with Chomsky (1981), that the structure of S is characterized as [NP - INFL - VP] in Universal Grammar, by a principle independent of the categorial system per se. However, I argue in Section 5 that \bar{S} Topics may not bind NP-trace, implying that "subject sentences" must appear in true subject position at D-structure. In addition, I suggest in Chapter 4 that in some cases S does not contain a VP position; the relevant examples involve small clause adjuncts.

49. An explanatory note is in order with respect to the indexing represented in the Extraposition structures; I have shown only the indexing relevant to each link in the chain; the subject position of the embedded clause bears two indices, since it is the source position of both the downward movement of Extraposition and the upward movement of Raising.

50. The one exception to this claim involves structures where another argument is already adjoined to VP, by virtue of extraposition from \bar{V} . These structures are discussed in Section 8.2.

51. See Chapter 6 and Section 8.2 of this chapter for further discussion of this construction.

52. There is evidence that Relative Clause Extraposition constructions are derived by movement. When a relative clause has split antecedents, they must be in parallel syntactic positions, indicating the effects of Williams' (1978) principle of across-the-board rule application. This is not a general property of interpretive linking rules, as shown by sentence-final result clause structures.

53. Alternatively, if the clause must appear in a θ -position by virtue of a condition on A-chains discussed in fn. 39, it would follow that VP-adjunction is required.

54. This recalls Jackendoff's (1977) \bar{V} -final position for an \bar{S} complement, essentially following Emonds (1970). Our account differs in assuming that the tensed clause appears adjacent to the verb in \bar{V} at D-structure, while appearing adjoined to VP at S-structure. The obligatory extraposition in English is analogous to Dutch, where \bar{S} complements must appear to the right of VP; cf. Reuland (1981a) for discussion.

55. Williams (1981) argues that only NPs may undergo NP-movement (Raising); he suggests that no movement applies in structures such as (i):

(i) It was reasoned [that John had left]

Williams argues against the Raising+Extraposition analysis for such constructions on the basis of the fact that the "intermediate" structure is ungrammatical:

(ii) *[That John had left] was reasoned (by Bill)

He suggests that where movement is possible, it is by virtue of the fact that the governing verb takes an NP complement. Perhaps examples such as those in (i) and (ii) should be captured along lines similar to the account of the [+R] adjectives discussed in Section 7.2 below.

56. Perhaps the most reasonable response to this would be to assume that the Raising verbs are essentially parallel to the passive examples discussed in the preceding footnote. That is, we might assume that both complement types are assigned a θ -role by the special rule for [+R] governors that is introduced in Section 7.2; this would imply that the Raising verbs share this abstract feature. If this were correct, then a θ -role could only be assigned to the

clausal complement if it appears in \bar{V} at S-structure, thus ruling out the possibility of movement through subject position. On the other hand, this kind of account, while perhaps appropriate for verbs such as *appear* and *seem*, may not be viable for verbs like *prove* and *happen*; see Section 7.2 for relevant discussion.

57. Note that if the Raising verbs assign Case to a tensed clause complement, but not to a to-infinitival complement, then the peripheral placement of \bar{S} in NP would follow automatically from the interaction of the CRP and the $\bar{\theta}$ -criterion. This would also explain two other properties of these constructions. First, if the verb assigns Case to the complement, it follows that movement through subject position is ruled out, either by the Binding Theory or by the definition of A-chains. Suppose we take the (Case-marked) trace in \bar{V} to be a complete A-chain -- in effect, a variable. Then the structure is ruled out by the Binding Theory, since the variable is A-bound from subject position. Suppose instead that we take the trace in \bar{V} to be a subsidiary position of an A-chain headed by subject position. Then the chain is ill-formed, if the definition of A-chains requires that they contain at most one position to which Case is assigned. This analysis would also explain why the complements to the raising adjectives can prepose to subject position, as noted in the text. Since adjectives do not assign Case, their complements behave exactly like the complements of passive verbs.

Unfortunately, this solution cannot account straightforwardly for the ungrammaticality of (i):

(i) *[That John is a fool]_i it seems [e]_i (to me)

If the trace is Case-marked, and is not co-indexed with it, then (i) should be possible. The trace in \bar{V} functions as a variable, to which the θ -role is

assigned, and the topicalized \bar{S} escapes Case assignment, satisfying the CRP.

58. Control from a PP complement is marginal in English; nevertheless it seems that the controlling PP is preferred in a position to the left of the complement clause:

- (i) The painter mentioned [to the tenants]_i [PRO_i not to touch the walls]
- (ii) *The painter mentioned [PRO_i not to touch the walls] [to the tenants]_i

It seems, however, that this preference is due to principles of Control, rather than of Phrase Structure; when the infinitival complement has arbitrary control, the order is more or less free:

- (i) John explained [how PRO_{arb} to fix a sink] [to his sons]
- (ii) John explained [to his sons] [how PRO_{arb} to fix a sink]

59. On the syntactic effects of passive morphology, see Williams (1981), Chomsky (1981), and Marantz (1981).

60. Note that gerunds differ in this respect, despite their status as control complements:

- (i) John_i remembered [PRO_i washing the dishes]
- (ii) [PRO washing the dishes]_i was remembered fondly [e]_i by John

Although the passivization facts have sometimes been attributed to properties of Subject Control, it seems that this does not act as a block when the complement is a gerund, suggesting that the account based on principles of Case Theory is to be preferred. (Recall that a verb assigns Case to a gerund complement, thus allowing (ii).)

61. On the special properties of the Subject Control verbs *promise* and *ask*, see Chapter 5, Section 6.1.

62. The ungrammaticality of these examples can't be attributed to the fact

that c-command is violated with respect to the antecedent of trace in (127b) or PRO in (127a,c). This is shown by the fact that trace and PRO are free to move to COMP if they are complements of an adjectival head:

- (i) [How likely [[e] to have arrived]] do you think that John really is --
- (ii) [How eager [PRO to help us]] do you think that John really is --

As Belletti and Rizzi (1980) observe, it seems that c-command requirements of this type make reference to an LF configuration to which Reconstruction has applied. (Note that this raises a potential problem with respect to NP-trace if the Binding Theory applies at S-structure.) At any rate, the whole issue of c-command is irrelevant to the ungrammaticality of (127d).

63. It might be possible to explain the fact that \bar{S} -trace may be assigned Case by assuming that the CRP only applies to the head position of a phrase -- and then only if the head has lexical content. Suppose that an infinitival clause has an empty head position; then a dummy preposition *to* could assign Case to this position at S-structure, satisfying the CRP and the "visibility" requirements on θ -role assignment. But this would create a problem for the ECP, unless *to* actually occupies the head position at LF; see Chapter 6 for related discussion.

64. Suppose that grammatical Case is assigned at the phrasal level, while morphological Case is adjoined to the head in the lexicon. Suppose further, in the spirit of Jaeggli (1980), that Case is "checked" within an X-bar projection. Then it is not obvious why infinitival clauses are treated as if the entire phrase bears Case, if *to* is adjoined to the head. Perhaps, as suggested to me by N. Chomsky, we could assume that infinitival *to* appears in COMP at S-structure, so that it assigns Case to the entire clause.

65. One issue that is unclear is how a verb subcategorizes for tensed vs.

infinitival complements. The vast majority of verbs select both, but it seems that some verbs specify that the clause must be one or the other. I have not introduced any categorial feature that distinguishes between the two clause-types; nevertheless, it does seem that subcategorization is involved to some extent; see Chapter 6 for discussion.

66. Note that when the WH-phrase is lexical, pied piping is obligatory. This represents a residue of the *[NP - to - VP] filter of Chomsky and Lasnik (1977) that has not been successfully subsumed under Case Theory. (Chomsky 1980 proposes that deletion in COMP is obligatory in an infinitival relative clause up to recoverability of deletion, but the principled basis for this is unclear. Moreover, there are empirical problems posed by genitival pied piping examples, suggesting that some principle of grammar ought to rule out a lexical NP in the COMP of an infinitival clause unless it is governed by a lexical head external to the clause.)

67. One exception to this is the verb *desiderare*, which allows both types of complements in some dialects.

68. The Italian bare infinitive complements may actually be analogous to the complements of the English modal verbs; see Chapter 4, Section 4 for discussion.

69. Actually, it is likely that a further restriction is required, such that the two infinitives be of the same type. Thus an English *to*-infinitive is free to take a gerund as its complement, despite the fact that it assigns Case to it.

70. It would be possible to derive the effects of the Double Infinitive filter from the θ -criterion, if there were some principle of grammar which

blocked the assignment of Case from one infinitive to another of the same type. Perhaps this is the key to accounting for the French examples discussed below in the text; if there were some auxiliary means of θ -role assignment for the French verbs, then the apparent inapplicability of the filter would be explained. I will not pursue this possibility here, however.

71. French infinitivals differ in certain respects from their Italian counterparts. Kayne (to appear b) argues that French *de* is a complementizer, while M.R. Manzini has argued in unpublished work that Italian *di* is adjoined to S. (Manzini's arguments are based primarily on Subjacency effects, but her conclusions mesh nicely with our proposal that *di* functions as a dummy Case-marker.) Note, incidentally, that *di*-infinitives only appear in complement structures, while French *de* may also appear with a subject infinitive, suggesting a complementizer-like status.

72. Of course, the Topicalization and Passivization facts follow straightforwardly from the Case Theory account, but would require additional stipulations in a Phrase Structure account of constituent order.

73. This account is due to Chomsky (1980), whose analysis is based partly on ideas of J.-R. Vergnaud. Kayne (to appear b) proposes an alternative account, according to which the English Exceptional Case-marking construction is derived by means of a null preposition in COMP assigning Case to the infinitival subject. Kayne relates this to the possibility of preposition stranding in an interesting way. One problem with this story is that it does not provide a principled account of why the complementizer *for* shows ECP effects, while the null prepositional complementizer does not:

- (i) Who do you expect [[e] to have arrived]
 John is expected [[e] to have arrived]

I expect [[e] to have arrived my good friend John]

(ii) *Who would you hate [for [e] to have arrived]

*John would be hated [for [e] to have arrived]

*I would hate [for [e] to arrive my good friend John]

Although the relevant distinction might be derived in the case of WH-movement through COMP along the lines suggested in Kayne (1980), it is not obvious how the relevant distinction could be derived in the examples involving Passive and Focus NP Shift constructions. In fact, proper government of trace in the Focus NP Shift constructions ought to be impossible given the Antecedent condition on Reanalysis proposed in Chapter 7, unless it is assumed that the verb directly governs the subject position.

74. This analysis is defended at length in Postal (1974). An analogous treatment in terms of Control is proposed by Bresnan (to appear). The major arguments traditionally cited in favor of the "object" status of the postverbal NPs in (143) are: (i) they are assigned objective Case; (ii) they are subject to NP-movement in Passive constructions; (iii) anaphors (but not pronominals) appearing in this position may be A-bound from the matrix subject position. All of these facts follow from the assumption that the matrix verb governs across the S-boundary of the infinitival complement, given the formulation of Case assignment in (18), and the Binding Theory in (42). (The crucial reference to the governor may create a problem for the revised version of the Binding Theory discussed in fn. 29; see Chomsky 1981 for discussion of this.)

75. The examples in (146) are analogous to cases cited by Mark Maltin involving "floating" emphatic pronouns in VP.

76. Actually, this point requires some elucidation. The basic problem concerns the status of the "raised" NP with respect to the operation of

NP-movement and Case assignment. Suppose that *Move α* only allows for (i) substitution, or (ii) adjunction to a maximal projection. Then the example in (143) must involve substitution. But this is only possible if the verb subcategorizes for an NP complement position, since the empty NP slot could not otherwise appear at D-structure. But if strict subcategorization features are simply addenda to slots in a θ -grid, then the matrix verb would have to assign a θ -role to the "raised" NP at LF. Clearly, this is not correct; therefore the subject must appear within S at S-structure. See also Section 6.3 for related discussion.

77. Note, however, that the infinitival complement in the Object Control construction does not appear adjacent to the governing verb, posing a problem for the assumption that it is assigned Case.

78. I have placed the NP-trace in the position adjacent to the verb primarily for ease of exposition. There is nothing that forces the trace to appear to the left of NP in this example. Since Case is not assigned to it by the verb, and proper government has no adjacency requirement.

79. See Keenan (1976) and Travis (1981) for a discussion of this issue.

— 80. Note, for instance, that *consider* appears in Exceptional Case-marking constructions, but does not allow an NP complement with propositional content.

81. In addition, Chomsky considers constructions involving clausal complements to Raising verbs, passive participles, and adjectives. I have already discussed θ -role assignment in the first two constructions; the adjectival examples are treated in Section 7.2. In addition, there are a number of special cases that are discussed in some detail in Chapter 6.

82. The questionable status of (159a) appears to derive from the fact that *attempt* is ambiguous between the meaning of an action nominal and that of a noun referring to the object argument. To the extent that (159a) is grammatical, it is impossible to construe *attempt* as a true action nominal.

The distinct status of infinitival complements in derived nominals has been noted independently by R. Kayne (personal communication), who observes the following contrast:

- (i) [John's claim to the effect that Mary is intelligent]
- (ii) *[John's claim to the effect to be intelligent]

83. For a discussion of V-P Reanalysis, see Chapter 7. (Incidentally, it seems that V-A Reanalysis would be ruled out by virtue of the Structure-Preserving condition proposed in that chapter.)

84. Actually, their discussion is based on the Focus NP Shift construction, which is grammatically equivalent to the tensed clause complement structure as far as the stranding facts are concerned, as we shall see shortly.

85. Although binding into the substructure of a word is impossible, it seems that incorporated reflexive pronouns and pronominal clitics are subject to the Binding Theory. The key to solving this apparent paradox is to assume that the clitic is linked to a co-indexed argument position in VP, along the lines proposed by Borer (1981). Then if the clitic and the argument position form a discontinuous element in some sense, the anaphoric or pronominal element within the verbal matrix will be subject to the Binding Theory by virtue of the empty phrasal position with which it is linked. This is not available for the trace within the reanalyzed complex verbs in (177), since there is no additional A-position in VP with which the trace is linked.

86. If passive participles are unable to assign objective Case, as assumed in Chapter 1, then the WH-trace must be assigned oblique Case in this structure. Note that the Case-assigning properties of the preposition are not absorbed by the passive morphology in these structures, since it is the Case reserved for the \bar{S} complement that has been absorbed.

87. This suggests that there is just one non-A-position to the left of S; presumably, this is the COMP position.

88. Emonds' (1976) account is similar in some respects to the solution proposed here. He suggests that the rule of Extraposition is obligatory when it applies from object position. Similarly, his account of "subject sentences" requires that topicalization apply obligatorily in the case of an \bar{S} in subject position. Unfortunately, these are both stipulations in Emonds' system, since they do not follow necessarily from general principles of grammar.

Although Koster's account provides a more principled explanation of the Topic status of sentential subjects, his account suffers from another serious problem noted by Baltin (1978). Under this account, it is a complete coincidence that virtually all of the verbs which take clausal complements in VP-final position also allow \bar{S} topics (indirectly) binding a gap in subject position. This has the consequence of forcing a dual subcategorization frame for every verb which can assign an "external" θ -role to a propositional argument. This is a serious redundancy on a vast scale, as shown by the diversity of the verbs in (1), which would all have to subcategorize for an \bar{S} complement, just in case they assign no external θ -role:

- (1) It would kill John's mother for him to reject her
 It shocks me that you said that word
 It would lead to a world war for China to invade East Germany

Without a rule of extraposition -- or intraposition -- this redundancy cannot

be avoided.

89. For the definition of c-command, see (54) above. See also fn. 30 and 53 for a possible alternative derivation of the NP-adjoined structure in the *it*-Extraposition construction; in addition, Kayne (1978) provides still another possible account for this.

90. This issue is of potential relevance to adjoined structures at the level of Logical Form, which are derived by QR. It might seem that ambiguities of quantifier scope involving QPs in both subject and object positions might force the possibility of double adjunction structures; but Robert May has suggested (personal communication) that such cases can be handled if it is assumed (i) that QR may adjoin to VP, and (ii) that a quantifier in subject position automatically takes scope over NP, without having to adjoin to S.

Appendix: The Insertion of Dummy Case-markers

In this appendix, I provide a brief discussion of the formal properties of the rules responsible for inserting dummy prepositions in the [+N] categories. I will concentrate on the English *of*-Insertion rule, but the conclusions reached here have general significance, since it is implausible to suppose that a child learning English actually induces the precise formulation of the rule on the basis of exposure to the primary linguistic data. Rather, it is likely that the child tacitly "expects" to find a rule such as *of*-Insertion, and the relevant learning involved here is the recognition that the phonological word *of* corresponds to the same abstract element that the French child learns to connect with *de*, and the Italian child, with *di*. For this reason, the formulation of the relevant rules is not an isolated problem in each language, and in fact we will refer to properties of the rules in other languages in our discussion of the English rule.¹

Recall that the rule of *of*-Insertion, unlike the rule of Case assignment formulated in Chapter 3, does not observe any adjacency condition. This allows the rule to apply to NPs that are not directly adjacent to a governing noun or adjective. One might be tempted to conclude from this that the rule of *of*-Insertion differs minimally from Case assignment, perhaps being formulated as in (1):

(1) *of*-Insertion (tentative)

In the configuration [α ... β ...] or [... β ... α],
adjoin *of* to β , where

(i) α governs β , and

(ii) α is [+N]

Under normal circumstances, β in (1) corresponds to NP; perhaps this should

be incorporated into the rule, but we will leave this matter open.

Although the formulation in (1) makes the requisite distinction between *of*-Insertion and Case assignment with respect to adjacency, it is somehow unsatisfying. Unlike the instances of subcategorized inherent Case discussed previously, *of*-Insertion shares with Case assignment the fact that it applies blindly, in structures that are directly parallel to Case assignment. Why, then, should the two rules differ with respect to adjacency to the governing head? There is some evidence which suggests that the reason for this is that the governing head does not directly trigger the *of*-Insertion rule.

The relevant evidence involves the phenomenon of Exceptional Case Marking, which we discussed in some detail in section 6. Recall that in structures such as those in (2), a verb is able to assign Case to the subject of its infinitival complement:

- (2) a. Sarah considers [_S them to be unreliable]
- b. Paul discovered [_S the pills to be powerful]

The bracketed material in (2) forms a single constituent at LF, D-structure, and S-structure.

But the clausal complement is infinitival, and is therefore unable to assign Case to its subject; the grammaticality of these sentences implies that the subject is assigned Case in some other way. The fact that the subject in (2) is marked objective suggests that the verb is responsible for assigning Case, and this is supported by the fact that the subject must be adjacent to the verb, as notes in our previous discussion of this construction.

It seems that these constructions are marked cross-linguistically, being entirely absent from many languages, and severely restricted to a lexical class of verbs even in English. This is just what we should expect, if \bar{S}

functions as a barrier to government, as suggested by Chomsky (1980). This implies that the clausal boundaries in (2) are made permeable to government in some way. There are various possible accounts of how this happens; for the sake of discussion, we will continue to adopt Chomsky's (1981) proposal that there is a lexically-triggered rule of \bar{S} -Deletion, which leaves the clausal complement dominated only by S. It is well known on independent grounds that S is not a barrier to government, by virtue of the fact that the infinitival complementizer *for* can assign Case to a lexical subject across S from COMP. Thus \bar{S} -deletion has the desired effect of permitting Case assignment to subject position without destroying the clausal integrity of the complement.²

The Exceptional case-marking construction is of interest in the present context because the rule of *of*-Insertion is not able to apply in an analogous environment, as noted by Chomsky (1970), Kayne (to appear, c) and others:

- (3) a. *_{[NP} Sarah's consideration [of them to be unreliable]
 b. *_{[NP} Paul's discovery [of the pills to be powerful]

It appears that *of*-Insertion is unable to apply across a clausal boundary, even when the clause is a complement of a nominal that is derived from an \bar{S} -Deletion verb, as indicated by the contrast between (2) and (3). If derived nominals are part of the same lexical entry as their related verbs, as the facts of strict subcategorization suggest then we would expect \bar{S} -deletion to apply in (3) as well, if triggering \bar{S} -deletion is a lexical property. (Note that the clausal complement is infinitival, so the derived nominal should be free to assign a θ -role to it, unlike the cases of tensed clause complements in derived nominals discussed in Section 7.) Suppose that this is correct. Then the ungrammaticality of (3) shows that *of*-Insertion is blocked, even though it meets the condition of government -- and of

adjacency, too, for that matter.

What is the explanation of this fact? Observe that where *of*-Insertion successfully applies, the NP is itself a complement of the head noun, and is therefore directly dominated by a projection of N:

- (4) a. [_N Sarah's [_N consideration - of - [the problem]]]
 b. [_N Paul's [_N discovery - of - [the pills]]]

The same is true for *of*-Insertion in AP:

- (5) a. Sarah is [_A [_A considerate - of - [her neighbors]]]
 b. John is [_A [_A fearful - of - [heights]]]

This suggests that the crucial trigger for the rule is actually direct domination by a projection of [+N]:

- (6) *of*-Insertion (revised)
 In the configuration [α ... β ...], adjoin *of* to β , where
 (i) α is some projection of [+N], and
 (ii) β is an immediate constituent of α .

Observe that the requirement in (6i) renders the government requirement in (1i) superfluous. Perhaps this is the explanation for the irrelevance of adjacency: the head noun or adjective is simply not involved in the rule's triggering environment.

Kayne (to appear, c) suggests an alternative explanation for the ungrammatical status of (3), maintaining the assumption that *of*-Insertion applies freely within the domain of government of the head. Kayne's proposal is that government is blocked in (3) because nouns (unlike verbs) are not permitted to govern across S.³ If this account were correct, then the failure of *of*-insertion to apply in this environment would be consistent with the formulation of the rule as in (1), and would not constitute evidence for the alternative formulation in (6).

But there are two reasons for preferring the account of (3) provided in (6) in terms of immediate domination. First, there is another construction which also involves Case assignment to an embedded subject which is not an argument of the governing verb, namely the constructions involving small clause complements:

- (7) a. I consider [_A John [_A quite stupid]]
 b. I prefer [_A my steak [_A rare]]
 c. I proved [_A him [_A wrong]]

As in the previous examples, the governing verb is responsible for assigning Case, and the adjacency condition holds:

- (8) a. *I consider very definitely [John [quite stupid]]
 b. *I prefer always [my steak [rare]]

As I shall argue in Chapter 4, there is evidence from subcategorization and the distribution of PRO which suggests that these "small clauses" are actually projections of the lexical categories, as with \bar{A} in (7). It is of interest in this context to note that while Exceptional Case marking of infinitival subjects is quite rare, the assignment of Case to the subject of a small clause is very common, suggesting that no language-particular rule of \bar{S} -deletion is involved here. Nevertheless, derived nominals can't assign Case to the subject of a small clause:

- (9) a. *OUR consideration [_A of Bill [quite stupid]]
 b. *Bill's preference [_A of his steak [rare]]
 c. *Kathy's proof [_A of him [wrong]]

Unless we were to stipulate that nouns can't govern across any category, the ungrammatical status of (9) constitutes evidence for (6) over (1).

Another reason for preferring the immediate domination account in (6) is that the failure of *of*-Insertion to apply to the subject position of a

complement clause is not restricted to cases where the governing head is a noun, but also applies in the case of adjectival heads:

- (10) a. Dirk expected [_S Jenny to feed the geese]
 b. Mario feared [_S his cat to be lost]
- (11) a. *Dirk was [_{AP} expectant [of Jenny to feed the geese]]
 b. *Mario was [_{AP} fearful [of the cat to be lost]]

Once again, the lexical property of \bar{S} -Deletion should extend to the derived adjectives in (11), given the "Remarks" theory of lexical entries. Therefore government of the embedded subject position ought to be possible in these cases, unless it could be shown that adjectives can never govern across an S-type boundary. But adjectives must be able to govern the subject position of an infinitival complement, as shown by (12):

- (12) a. John seems [_{AP} certain [[e] to leave]]
 b. Frank is [_{AP} sure [[e] to like this sandwich]]

In (12), the trace in the embedded subject position must be properly governed in order to satisfy the ECP, and the contrast between (12) and (13) suggests that it is the adjective rather than the matrix verb which is the governing element in (12):

- (13) *Frank is [_{AP} probably [[e] to like this sandwich]]

Even with adjectives like *certain* and *sure*, which must be able to govern subject position, *of*-Insertion is blocked:

- (14) a. *It seems certain [of Bill to leave]
 b. *It is sure [of Frank to like this sandwich]
 cf. c. It is certain [that Frank will like this sandwich]

Thus *of*-Insertion can't apply, even in environments where government obtains; but once again, this is just what is predicted by the formulation in (6),

which claims that *of*-Insertion is insensitive to government, requiring only immediate domination by some projection of [+N].

Thus the rules of Case assignment and *of*-Insertion overlap in their domains of application -- abstracting away from categorial distinctions -- in the simple cases of a head and a single NP complement. But whenever the NP appears in a position which is either not adjacent to the verb or else contained within another complement of the head, the distinct properties of the two rule-types reveal themselves. Whereas *of*-Insertion can apply in nonadjacent environments where Case assignment may not, *of*-Insertion is blocked in domains of government which do not involve immediate domination by a projection of the governor.

I have formulated (6) very loosely, allowing *of*-Insertion to apply freely in any projection of [+N]. This may appear to be too loose, since all of the cases covered so far have involved domination by \bar{N} or \bar{A} . Moreover, (6) overgenerates, if it applies in $\bar{\bar{N}}$:

- (15) a. $*[\bar{\bar{N}} \text{ of } - [\text{the city}]_1 [\bar{N} \text{ destruction } [e]_1]]$
 b. $*[\bar{\bar{N}} \text{ of } - [\text{Paul}]_1 [\bar{N} \text{ discovery of } - [\text{the pills}]]]$

It is not obvious, however, that (6) must be complicated so as to explicitly rule out (15).

Borer (1981) argues that the rule of *sel*-Insertion in Modern Hebrew -- which is directly analogous to *of*-Insertion in English -- must be allowed to apply at the $\bar{\bar{X}}$ level.⁴ As noted above, it is unlikely that the English child explicitly learns the domain of application of the *of*-Insertion rule; therefore the fact that the rule must apply at the $\bar{\bar{X}}$ level in Hebrew supports the simpler formulation in (6):

Even in English, it seems that postposed subject NPs are subject to *of*-Insertion in derived nominals:

- (16) a. [\bar{N} the singing of - [the children]]
 b. [\bar{N} the recovery last week of - [the patient]]

Similar cases can be found in APs with post-adjectival subjects:⁵

- (17) a. That was [\bar{A} very considerate of - [Mary]]
 b. [\bar{A} How stupid of - [John]] to do such a thing!

Although it is not necessarily obvious that the postposed subjects in (16) and (17) are at the \bar{X} level as opposed to the \bar{X} level, this is certainly the null hypothesis, given X-bar theory.

Why, then, should (15) be excluded? Perhaps *of*-Insertion is blocked in prenominal subject position because this is the environment where genitive Case is assigned. Specifically, suppose that genitive Case is formulated so as to apply in the prenominal specifier position:⁶

(18) Genitive Case Assignment (tentative)

In the configuration [α ... β ...]
 assign genitive Case to β , where

- (i) α = [+N , -V], and
 (ii) α = \bar{X} , and
 (iii) β is an immediate constituent of α , and
 (iv) for some γ , γ the head of α , β precedes γ .

Given this formulation of genitive Case assignment, we might account for the failure of *of*-Insertion to apply in prenominal position by invoking Kiparsky's (forthcoming) principle that a special rule R_i always takes precedence over a general rule R_j in their overlapping domain. More precisely, if R_i applies in a set of environments E_i , and R_j applies in the environments E_j , and E_i is a proper subset of E_j , then R_i applies in E_i and R_j does not. Take the genitive Case assignment rule to be R_i and the *of*-Insertion rule to be R_j ; then *of*-Insertion is blocked from applying in (15) by Kiparsky's principle.⁷

But the formulation of (18) is excessively complex, suggesting that something is being missed. Moreover, some of its conditions seem to be stipulations serving only to prevent its application in those domains where (6) applies. Worse still, in many languages which lack any rule corresponding directly to (6), genitive Case assignment is free to apply in \bar{N} , in violation of (18ii); Sanskrit and Japanese appear to be examples of this. Moreover, genitive Case assignment also applies to NPs which follow the head position in some languages (e.g. Russian). These facts suggests that it is really *of*-Insertion which is the special rule R_1 , which is specifically formulated so as to apply in post-head position. Specifically, suppose that condition (19iii) were added to (6):

(19) of-Insertion (final version)

In the configuration [α ... β ...], adjoin *of* to β , where

- (i) α is some projection of [+N], and
- (ii) β is an immediate constituent of α , and
- (iii) for some γ , γ the head of α , γ precedes β .

The empirical support for (19) is not just the ungrammaticality of (15). Rather, it appears to be quite generally true that no language has a rule analogous to *of*-Insertion which applies in pre-head position. Suppose that this is correct. Then (18) could be simplified to (20):

(20) Genitive Case Assignment (final version)

In the environment [α ... β ...], assign genitive Case to β , where

- (i) α is some projection of [+N, -V], and
- (ii) β is an immediate constituent of α .

A language will have (19) only if it has a dummy prepositional Case marker corresponding to English *of*; this is true of French (*de*), Italian (*di*), and Hebrew (*se*), among others. Similarly, a language will have (20) if it has morphological genitive Case; this is true of English, Russian, Japanese,

Hebrew, and Sanskrit for NPs, and of French for pronouns.⁸

Suppose that Kiparsky's principle only considers structural conditions in determining which of two rules is the more general, overlooking categorial distinctions.⁹ Then (19) will count as the special rule, by virtue of its requirement (iii), and genitive Case assignment will be correctly blocked from applying in postnominal position in any language which has both rules.

It is likely that (19) and (20) require further refinement. For instance, (20) (unlike (19)) may apply to the subject of a gerund:

- (21) a. I was impressed by [John's [washing the dishes]]
 b. *I was impressed by [(the) [[washing the dishes] of John]]

Presumably this is related to the fact that gerunds are unspecified for the Tense feature; perhaps (19i) should be amended to require that α be [-Tense].

Another curious fact is that both (19) and (20) are blocked from applying twice in a single phrase. This is true of (19) in English:

- (22) a. *[[the singing of the lullabies] of the children]
 b. [[the singing of the lullabies] by the children]

Similarly, (20) is blocked from applying twice in Sanskrit:

- (23) a. [agopasya dohaḥ]
 non-cowherd-GEN milking
 'milking by one who is not a cowherd'
 b. [gavām dohaḥ]
 cows-GEN milking
 'milking of cows'
 c. *[agopasya gavām dohaḥ]
 'milking of cows by one who is not a cowherd'
 d. [agopena gavām dohaḥ]
 non-cowherd-INST
 'milking of cows by one who is not a cowherd'

Analogous constraints have been observed in other languages; moreover, the phenomenon does not appear to be limited to the two rules discussed here.

Spanish does not allow two arguments in phrase to be assigned the dummy Case-marker *a* (cf. Jaeggli 1980); similarly, Japanese has a well-attested "Double-o" constraint.¹⁰

Perhaps all of these phenomena can be traced to the effects of a general filter which rules out identical grammatical markings (Case, dummy Case-marker, etc.) on two or more arguments in a phrase:

(24) $*[\gamma \dots \alpha \dots \beta \dots]$, where

(i) α, β are arguments in γ , and

(ii) α, β are assigned the same grammatical marking in α .

As stated, the filter is probably much too strong; I will not attempt to work out its consequences in detail here, however.¹¹

FOOTNOTES: APPENDIX

1. I will ignore in this discussion the rules responsible for inserting dummy prepositions in VP, since these appear to be lexically triggered.
2. Note that when a complementizer appears in the clause, \bar{S} -deletion is blocked; see Section 6 for discussion.
3. Kayne's idea is based on a fuller discussion in Kayne (1981), where the ability to govern across S is linked to the ability to assign a superscript index (in the sense of Rouveret and Vergnaud 1980) to a complement.
4. I am grateful to Hagit Borer for bringing this issue to my attention.
5. For a more detailed discussion of "subjects" in AP, see Chapter 4.
6. Condition (i) limits the rule to application in NP; Condition (ii) allows it to apply only at the \bar{X} level; Condition (iii) prevents application of Exceptional Case-marking analogous to (2) vs. (3); Condition (iv) prevents it from applying to an NP which follows the governing head.
7. Kiparsky's principle is actually based on a principle assumed by the Indian grammarians' theory of Sanskrit grammar in the Pāṇinian tradition. See Kiparsky (forthcoming) for discussion.
8. Since the rule of genitive case assignment applies only to pronouns, it counts as the special rule, blocking $\bar{d}e$ -Insertion from applying to pronominal Possessor NPs.
9. Perhaps this follows from the fact that this principle normally applies only to phonological and morphological rules.
10. The literature on the "Double-o" constraint is very extensive; see Farmer (1980) for discussion and references.

11. This filter might account for the fact that Subject postposing in French and English is subject to a transitivity constraint, if the postposed subject is assigned objective Case, as suggested in Stowell (1979). The effect of (24) recalls the interaction of "merger" with the Consistency Condition in the framework of Bresnan (to appear).

CHAPTER FOUR: THE DISTRIBUTION OF SPECIFIERS

1. In this chapter we turn our attention to the distribution of specifiers in various categories. Most of the discussion will be concerned with subjects and modifying phrases, although I will sketch out the general framework of a possible account of the verbal specifier system in Section 4. I should mention at the outset that no account will be provided for most of the complex structure of the prenominal specifier system explored in depth by Jackendoff (1977), so our contention that the categorial component may be dispensed with must be regarded as unproved in that domain. The story begins with the subject position.¹

1. Subjects Across Categories

1.1 Which syntactic categories may contain subjects? In the Aspects theory, it was generally accepted that the only category containing a subject position was S; this assumption provided part of the motivation for the traditional transformational derivation of derived nominal constructions, beginning with Lees (1960). But Chomsky's (1970) analysis of derived nominals forced the abandonment of this assumption, resulting in a category-neutral conception of the subject position, generalizing across NP and S.

Despite this theoretical shift, it has generally been tacitly accepted, even within the framework of X-bar theory, that NP and S are the only categorial phrases that contain a structural subject position. In fact, this assumption forms a crucial basis for Jackendoff's (1977) categorial feature system, since he argues that one of the major categorial features triggers the expansion of the subject position at the X'' level.²

Clearly, this kind of approach is inconsistent with the assumption that the categorial component does not exist. Although it is possible for

the language-particular instantiation of the X-bar system to define a specific position in the hierarchical structure as the subject position, it is impossible for the X-bar system to distinguish among the categories in terms of whether this position is available. It is therefore necessary to consider carefully the motivations for the assumption that the subject position is category-specific, and to see if the categorial asymmetries, where they exist, can be derived from other principles of grammar.

Perhaps a natural approach would be to explore the possibility that the distribution of the subject position across categories is determined by the principles of θ -role assignment. Suppose it could be shown that only in S and NP is there ever a θ -role assigned to an external argument in the sense of Williams (1980a). Then the failure of the subject position to appear in the other categories could plausibly be attributed to the theory of θ -role assignment, and it would not be necessary to assume that there is a categorial asymmetry defined by the theory of phrase structure. There are reasons for rejecting this approach, however. First of all, it is simply not the case that categories such as VP, AP, PP, or participial phrases assign no external θ -role. In fact, as Jackendoff (1977) observes, these categories may even specify selectional restrictions on their external arguments. Furthermore, the subject position of S appears even when no θ -role is assigned to this position, as observed by Emonds (1976) and Chomsky (1981). These considerations suggest that if the subject position is limited to NP and S, it is not by virtue of the principles of θ -role theory.

Indeed, it seems clear that the relevant distinction is due to principles of the theory of syntax. Consider, for instance, the fact that the presence or absence of the copula determines the possibility of a lexical subject, despite the fact that the copula assigns no θ -role to the subject

position:

- (1) a. John is tall
- b. [John's being tall] annoyed me
- c. [John's tallness] annoyed me
- (2) a. *John tall
- b. *[John('s) tall] annoyed me

Contrasts of this type are not limited to AP, but rather hold true of other categories as well:

- (3) a. John was [_{PP} in the garden]
- b. John was [_{PRTP} mocked by his kids]
- (4) a. [John's being in the garden] annoyed me
- b. [John's being mocked by his kids] surprised me
- (5) a. *John in the garden
- b. *John mocked by his kids
- (6) a. *[John('s) in the garden] annoyed me
- b. *[John('s) mocked by his kids] surprised me

At first blush, these contrasts suggest that the traditional assumption of category-specific base rules has some merit.

But the lack of lexical material in a specific syntactic position does not necessarily imply that the position does not exist. To see this, consider the subject position of an infinitival clause. There is considerable evidence suggesting that infinitivals have the categorial status of \bar{S} .³ But infinitival clauses often appear without lexical subjects:

- (7) a. John saw Bill
- b. I wonder [who [John saw --]]
- (8) a. *John to see Bill
- b. *I wonder [who [John to see --]]
- cf. c. I wonder [who [PRO to see --]]

- (9) a. I bought a book [that [you can read]]
 b. *I bought a book [[you to read]]
 c. I bought a book [for [you to read]]
 d. I bought a book [[PRO to read]]

As we have already seen in the preceding chapter, the ungrammaticality of the sentences in (8a,b) and (9b) cannot be attributed to an illegitimate expansion of the base rule for S, since this position clearly has a syntactic subject position. Rather, the explanation comes from the theory of Case.

Only under special circumstances is the subject position of an infinitival clause assigned Case. If the [-N] complementizer *for* appears in COMP as in (9c), then Case is assigned to the adjacent subject position, which is governed across S by *for*. Similarly in the Exceptional Case-marking construction, the matrix verb triggers \bar{S} -deletion, which enables it to assign Case to the subject position of a complement clause. In these constructions, a lexical NP may appear in the infinitival subject position, since it meets the "visibility" condition on θ -role assignment, and the θ -criterion is satisfied.⁴ But in other constructions, the subject position of the infinitival is not assigned Case, and no lexical NP may appear there. Rather, the position must be occupied either by PRO or by NP-trace, depending on the status of the subject position with respect to government. If the subject position is ungoverned, then PRO will appear there, as in (8c) and (9d); if it is properly governed, then trace will appear there, as in (10):

- (10) a. [Ben]_i seems [_S [e]_i to like his food]
 b. [John]_i is believed [_S [e]_i to like pizza]

In these environments, lexical NP will never appear, since its lack of Case features would block θ -role assignment, resulting in a violation of the θ -criterion.

In this light, reconsider the examples of lexical subjects in the other categories cited above. The ungrammaticality of (2) follows from the fact that there is no governor that can assign Case to the subject position of AP. Unlike \bar{S} , AP does not contain a tense operator, so it does not have a COMP position in which a Case-assigning complementizer such as *for* could appear. Moreover, the rule of genitive Case assignment only applies in NP, so the genitive version of (2b) is also ruled out. Similar remarks obtain with respect to the prepositional and participial phrases in (5) and (6): since there is no rule that can assign Case to the subject position of these phrases, lexical NP subjects are ruled out by virtue of the θ -criterion.⁵ Thus the absence of lexical subjects from these categories need not be attributed to the theory of phrase structure, since the relevant empirical coverage can be deduced from Case Theory. The Case Theory account is required independently to distinguish among various types of \bar{S} complements which must be treated as equivalent from the perspective of the theory of phrase structure; therefore the deduction comes entirely without cost, and is to be preferred over an account stated in terms of categorial rules, by Occam's razor.

1.2 If the distribution of lexical NP subjects is determined by the interaction of the principles of Case Theory and θ -role Theory, rather than by the theory of phrase structure, then we might expect that in special circumstances where these principles are satisfied, lexical NP might be able to appear as the subject of categories other than S and NP. If such cases can be found, they would constitute empirical evidence for the Case Theory approach, since the theory which controls the distribution of lexical subjects by means of category-specific phrase structure rules predicts that such structures should not exist. As it turns out, it doesn't require too much

searching to find the relevant examples.

Although the rule of genitive Case assignment applies only within the projection of a [+N, -V] head, the rule of *of*-Insertion applies within AP, as we have already seen.⁶ In the position preceding the head, *of*-Insertion is inapplicable -- due to its formulation in UG, as noted in the Appendix to Chapter 3. But in the post-adjectival position, *of*-Insertion is free to apply; therefore, if APs may contain subjects that can appear in postposed position, the possibility of *of*-Insertion ought to allow a lexical NP to show up. In fact, the relevant examples are commonplace:

- (11) a. That was [_{AP} very nice of - [John]], wasn't it?
 b. [_{AP} How very clever of - [you]], Bob!
 c. To have come home alone at that hour was [rather careless of - [Mary]]

Such examples only occur in copular constructions such as these, because when AP occurs as a modifier, the external argument is subject to Control, as we shall see further below.⁷

In another domain, lexical NP subjects are even more common, cutting across virtually all the syntactic categories. The relevant construction is analogous to the Exceptional Case-marking construction discussed in Chapter 3, involving Case assignment by a governing verb. Consider the following:

- (12) a. I consider [_S John to be very stupid]
 b. I expect [_S that sailor to be off my ship (by midnight)]
 c. We feared [_S John to have been killed by the enemy]
 (13) a. I consider [_{AP} John [_A very stupid]]
 b. I expect [_{PP} that sailor [_P off my ship] (by midnight)]
 c. We feared [_{PrTP} John [killed by the enemy]]

Each verb in (12-13) takes a complement that is assigned the θ -role of Propositional Object. In each case, the "small clause" in (13) is assigned

exactly the same θ -role as the full infinitival clause in (12). Suppose that the structures in (13) are as indicated. Then we find that lexical NP appears in the subject position of these phrases in exactly the environment that we ought to expect, given Case Theory: adjacent to a governing verb. Just as the verb assigns Case across the S-boundary in (12), it is able to assign Case across the phrasal boundaries in (13). This permits θ -role assignment to proceed, satisfying the θ -criterion. Hence if the structural description in (13) is accurate, we have striking confirmation of the Case Theory account of the distribution of lexical subjects across syntactic categories, since under traditional assumptions such structures should be impossible.

The available evidence suggests that the structures shown in (13) are exactly correct. Consider first the constituent structure of the complement, ignoring categorial labels. As with the Exceptional Case-marking construction, the clausal structure is implied by the Projection Principle, since the governing verb assigns just one θ -role (to a propositional complement) at LF. If such structures were treated as cases of Control, as for instance in Bresnan (to appear), then the theory of Control must be weakened so as to allow for θ -role transmission to a controlling NP; similarly, the theory of subcategorization would have to allow for subcategorization features that are entirely independent of the thematic structure of the verb. Finally, as with the Exceptional Case-marking construction, adverbial material may not intervene between the subject and the rest of the "small clause":

- (14) a. *I consider John myself to be very stupid
 b. *I expect that sailor sincerely off my ship by midnight
 c. *We feared John with great concern killed by the enemy

Although an adjacency requirement is well-motivated for the rule of Case assignment, it is normally not required of either Raising or Control structures;

on the other hand, the ill-formedness of (14) follows automatically if the complement structure is as indicated in (13).

Suppose we accept that the complement structures in (13) do in fact involve "small clauses". Must we accept that these have the categorial status of AP, PP, PrtP, etc.? The answer appears to be: Yes. Suppose instead that these clauses have the categorial features of S, as has sometimes been assumed. The verb assigns a θ -role to the clause as a whole; since subcategorization features are simply addenda to slots in thematic grids, the verb is unable to specify the categorial features of anything other than the entire complement. This is the "locality" property of strict subcategorization. It then follows that the governing verb should be indifferent to the categorial status of the predicate phrase within the small clause; in other words, the complements in (13) should be freely interchangeable. But this is not true:

- (15) a. *I consider John off my ship
 *I consider John killed by the enemy
 b. *I expect that sailor very stupid
 c. *We feared John very stupid
 *We feared John off the ship already

Thus if the locality of strict subcategorization is to be maintained (i.e. if subcategorization features are linked to specific slots in thematic grids), then the clausal status of the complements in (13) forces the conclusion that APs, PPs, and participial phrases may contain lexical NP subjects, where the principles of Case Theory and θ -role assignment are satisfied.

There is one major category that I have ignored thus far: VP. Although Jackendoff (1977) assumes that VP may contain a subject, this is because he treats S as a projection of V. Nevertheless, we do find VP complements with lexical subjects, namely the complements to Perception verbs and Causative verbs:⁸

- (16) a. I heard [_{VP} Jack [come into the kitchen]]
 b. Jane watched [_{VP} Mary [open the letter]]
- (17) a. Nancy made [_{VP} Scott [take out the garbage]]
 b. Anne let [_{VP} Peter [wash the dishes]]

The complements of Perception verbs and Causative verbs have some peculiar properties which suggest that they may have a special status; I shall discuss these briefly further below.

1.3 The analysis of small clause complements advocated here makes it unnecessary to stipulate by means of base rules that there is a PRED position in VP immediately following the NP object position. By virtue of the structural integrity of the small clause complement, it is impossible for other complements of the governing verb to appear between its subject and predicate, while the adjacency condition on Case assignment guarantees that the entire clause must appear immediately to the right of the governing verb. Thus no special assumptions are required to derive the position of these complements in VP; the facts follow automatically from the principles that account for simple NP and \bar{S} complement structures. Quite apart from the fact that this is the optimal solution, given the assumption that the Categorical component does not exist, it is advantageous for other reasons as well.

As observed by Jackendoff (1977), the traditional phrase structure label associated with the PRED position has no categorial content; in Jackendoff's words, "postulating this node is as much a mistake as postulating the node Agent" (p. 67). The traditional motivation for the category-neutral PRED position comes from the fact that the position is characterized by a logical function, rather than by the categorial features of the phrase in question. In a theory which derives the order of complements by means of categorial rules, this is problematic, since the apparently necessary reference to the

logical function of the phrase violates the principle of the autonomy of syntax.

Jackendoff proposes that the PRED position should be replaced by a slot that is reserved for an NP or AP complement; he suggests that this position is also made use of in the Double Object and Verb-Particle constructions. Quite apart from the fact that this type of solution is incompatible with the theory of grammar advocated here,⁹ it is troublesome even within the terms of traditional assumptions. By grouping the AP complement structures together with the Double Object and Verb-Particle constructions, this account loses the generality of the small clause complement structures, and is forced to assign the PP, VP, and participial predicates to a distinct syntactic position, despite the fact that they are directly parallel in their position within VP. Moreover, it is dubious that there is a genuine generalization captured by grouping the [+N] predicative complements together with the Double Object and Verb-Particle complement structures, since the latter constructions have very special properties which suggest that they have a radically different structure, as I shall argue extensively in Chapter 5.¹⁰

The analysis of the small clause complements proposed here avoids the problems inherent in the previous approaches. The apparent violation of the autonomy of syntax is an artifact of the assumption that the PRED position is defined by the Categorical rule for \bar{V} . In fact, the "PRED" position is no more than the predicate within the small clause; since any syntactic category may project to include a subject position, thus forming a clause, it follows that there is no subset of categorial features which defines this position, even within the framework of a theory that allows for a component of phrase structure rules. A category-neutral PRED position is a natural corollary of a category-neutral Subject position; once the LF notions of "clause" and "object" are assumed to be defined exclusively in terms of hierarchical structure, the categorial

status of the predicate is determined entirely by the subcategorization features associated with the clause as a whole.¹¹

1.4 Thus far, I have only considered structures in which a lexical NP occurs in the subject position of a small clause. In fact, this is not an entirely representative sample. When the subject position of the clause is properly governed by a lexical head, we ought to expect trace to appear in this position.¹² In fact, this is just what we find:

- (18) a. [John]_i, I consider [_{AP} [e]_i very stupid]
 b. [Who]_i do you expect [_{pp} [e]_i off your ship by midnight]?
 c. John is the one [who]_i we feared [_{prtP} [e]_i killed by the enemy]
 d. [Which man]_i did you hear [_{vp} [e]_i come into the kitchen]?

Moreover, if the matrix verb is a Raising verb or passive participle, and governs without assigning Case, then NP-trace appears in the subject position of the complement:

- (19) a. [Rachel]_i seems [_{AP} [e]_i very tired]
 b. [The solution]_i proved [_{AP} [e]_i ridiculously simple]
 (20) a. [The sailor]_i is expected [_{pp} [e]_i off this ship by midnight]
 b. [John]_i was feared [_{prtP} [e]_i killed by the enemy]

Actually, there are a number of curious asymmetries among the small clause complements with respect to the possibility of such structures. None of the true Raising verbs appear to allow for clausal complements other than \bar{S} and AP, while passives formed from VP complement structures appear to be ungrammatical:¹³

- (21) a. *[John]_i seems [_{pp} [e]_i in his bedroom]
 b. *[Jack]_i was heard [_{vp} [e]_i come into the kitchen]

The ill-formedness of these examples does not arise from the fact that the meaning

of the predicate violates the selectional restrictions of the matrix, as is shown by the fact that a simple switch to an infinitival copular structure renders them fully grammatical:¹⁴

- (22) a. [John]_i seems [_S [e]_i to be in his bedroom]
 b. [Jack]_i was heard [_S [e]_i to come into the kitchen]

The systematic exclusion of examples such as (21) raises interesting issues that I will not attempt to tackle here; for some discussion, see Manzini (1981).

More complex issues arise when we consider the possibility of PRO appearing in the subject position of a small clause. When the clause appears as a subcategorized complement, it may never contain a PRO subject; thus there are no small clause counterparts to infinitival Control complements, as there are to infinitival Raising and Exceptional Case-marking complements:

- (23) a. *I expect [_{PP} PRO off this ship (by midnight)]
 b. *Nancy tried [_{AP} PRO nice to her brother]
 c. *I was hoping [_{PrtP} PRO released tomorrow]
 d. *Peter was unable to see [_{VP} PRO do that]

On the other hand, small clause adjuncts appear to allow PRO to appear in the subject position:¹⁵

- (24) a. Scott wandered home [PRO drunk]
 b. The farmer loaded the truck [PRO full of hay]
 c. Jack rolled the dough [PRO into a ball]
 d. John emerged from the meeting [PRO confused by their reaction]

Thus there appears to be an asymmetry holding between subcategorized complements and adjuncts with respect to the possibility of PRO appearing in subject position.

It is reasonable to attribute the ungrammaticality of the subcategorized examples to the Binding Theory in some way. Recall that PRO may never be governed, by virtue of its dual status as a pronominal and as an anaphor. We

know independently that the subject position of a subcategorized small clause is governed, by virtue of the constructions discussed previously; our current concern is to account for why government always holds in such structures, while providing a principled distinction between these examples and the adjuncts in (24).

Consider first the subcategorized clauses in (23). Let us assume that these examples are ruled out by virtue of PRO being governed; we must now ask what the governing element is, bearing in mind that government apparently does not hold in (24). In Stowell (to appear), I suggested that the relevant governor is the matrix verb. Small clauses apparently differ from infinitival \bar{S} complements in always being transparent to government from the matrix. For this reason, Exceptional Case-marking structures are considerably more rare cross-linguistically than their small clause counterparts. Exceptional Case-marking is dependent upon \bar{S} -deletion or some analogous process which is triggered by a proper subset of the verbs taking infinitival \bar{S} complements in English; in contrast, small clause complements with lexical subjects are very common cross-linguistically, appearing in languages such as French:¹⁶

- (25) a. *Je crois [_S Jean être malade]
I believe Jean to be sick
- b. *J'imagine [_S son frère être intelligent]
I imagine his brother to be intelligent
- (26) a. Je crois [_{AP} Jean malade]
I believe Jean sick
- b. J'imagine [_{AP} son frère intelligent]
I imagine his brother intelligent

Suppose, then, that small clause boundaries never function as barriers to government; then the possibility of structures such as (13) and (26) would be exclusively dependent upon a Case-assigning verb subcategorizing for the appropriate categorial features, while the Control structures in (23) would

be ruled out by the Binding Theory. If the small clause adjuncts in (24) fall outside the domain of government of the verb, then the possibility of the PRO subjects is accounted for.

There are two problems with this story, however. First of all, it is far from obvious that all of the small clause adjuncts in (24) appear in ungoverned positions. In particular, it seems that object control is obligatory in (24b,c), suggesting that the adjunct appears within VP; cf. Williams (1980a). Second, if the head of a phrase governs within all of its projections, as implied by the definition of government proposed by Aoun and Sportiche (forthcoming), then the subject position of a small clause ought to be governed internally by its lexical head, regardless of its external environment.¹⁷

Chomsky (1981) proposes an alternative account of the asymmetry holding between the subcategorized small clauses and their adjunct counterparts. He assumes that the domain of government of a lexical head projects through the X-bar structure, thus ruling out the examples in (23) without reference to the external governing verb. The adjunct Control structures are permitted, under the additional assumption that these clauses are not in fact projections of AP, PP, PrtP, etc., but rather have the categorial status of S. As Chomsky observes, the issue of the locality of strict subcategorization does not arise with the adjunct clauses, so there is no compelling reason to assume necessarily that they are projections of the lexical categories of the heads of their predicates.

In order for this story to go through, we must somehow rule out the possibility of a verb subcategorizing for an S-type small clause, which would trivially circumvent the effects of government. Various possibilities suggest themselves. For instance, we might assume that it is only possible for a verb to subcategorize for a maximal projection; then if S is not maximal, subcategorization for an S-type small clause is impossible.¹⁸ Alternatively,

we might assume that S, like all categorial phrases, is endocentric. Then if the adjunct small clauses are not headed by a lexical category, they would have to be headed by INFL. Suppose now that the INFL of a small clause is equivalent to PRO in some sense; then such clauses could never appear in a governed position, by virtue of the Binding Theory.¹⁹

There is one final possibility that has rather intriguing consequences which go far beyond the scope of this discussion. Specifically, we might accept Chomsky's suggestion that the lack of strict subcategorization to be crucial in permitting the clause not to be a projection of the lexical category of its predicate. However, we can take this approach one step further and assume that the adjunct clauses have no categorial features at all! In other words, we might assume that the categorial status of the S-system is directly linked to the Tense feature, which is clearly absent from the small clause adjuncts in (24); then these clauses could not have the categorial features of S. But the Binding Theory prevents them from being projections of their predicates, since PRO may not be governed. If there is no Categorial component, and if X-bar theory defines pure hierarchical structures without categorial content, then categorial features may only be assigned to phrasal constituents by virtue of "percolating" through the X-bar projection of a lexical head. Suppose now that this percolation is optional, applying only where required by the principles of strict subcategorization. Then the adjuncts in (24) would lack categorial features entirely, accounting for the lack of government of the subject position and the impossibility of such a complement satisfying subcategorization requirements of a governing verb. The lack of categorial features on the clause would not prevent the configuration from being interpreted as a control clause at LF, since the LF notions of "subject", "predicate", and "proposition" (or "clause") are all defined in category-neutral

terms. The assumption that phrasal constituents might lack categorial features entirely in structures such as these does not appear to cause any obvious problems, and there is no principled basis for assuming that such structures are impossible, within the framework of a category-neutral base assumed here.

2. The Category of the Subject

2.1 In the preceding section I argued that the structural subject position is not limited to the categories NP and S, but rather generalizes across categories, the limited distribution of lexical NP subjects being accounted for by the principles of Case Theory. This is a necessary conclusion, if the Categorial component of the grammar does not exist. But the lack of a Categorial component also has another implication. If the X-bar principles are category-neutral, then it is impossible for any syntactic position to be specifically reserved for any particular category; therefore the subject position cannot be specified as an NP position per se.

In Chapter 3, we saw that only NPs actually appear in the subject position at S-structure; the fact that the [-N] and [+Tense] categories may not appear as S-structure subjects follows from the interaction of the Case Resistance Principle with the θ -criterion. If the subject position is assigned Case, then the appearance of \bar{S} or PP in this position at S-structure violates the CRP; if the position is not assigned Case, then an argument appearing there cannot satisfy the "visibility" condition on θ -role assignment, and the θ -criterion is violated.

This type of account implies that \bar{S} and PP ought to be able to occur in the subject position at D-structure, provided that they move out of this position in the mapping from D-structure to S-structure, either by virtue of Topicalization or *it*-Extraposition. With respect to \bar{S} subjects, this

conclusion is fairly straightforward; moreover, the facts concerning Topicalization of \bar{S} complements from VP supports this account, since the lack of topicalized infinitival complements forces us to assume that an \bar{S} topic may not bind an NP trace in an A-position. From this it follows that the topicalized \bar{S} subjects must bind an \bar{S} -trace in subject position, a possibility which is implied by the category-neutral base.

The facts concerning PP subjects are more complex. I observed in Chapter 3 (fn. 43) that PP may appear in subject position only when the verb is copular:

- (27) a. [Under the chair] is a nice place for the cat to sleep
- b. Is [under the chair] a nice place for the cat to sleep?
- (28) a. *[Under the chair] pleased the cat
- b. *Did [under the chair] please the cat?
- cf. c. Did it please the cat [under the chair]?

It was suggested there that the contrast between the copular structures in (27) and the corresponding examples in (28) might be due to a special property of copular constructions which permits nominative case to be absorbed or deflected away from the subject position. (Perhaps this is a consequence of the special status of "identificational" copular constructions with respect to θ -role assignment.²⁰) The Contrast between (27) and (28) would then follow from the fact that the CRP is violated in (28a,b) by virtue of the nominative Case assigned to the PP subject; the Extraposition construction in (28c) is permitted because Case is assigned to the head of the chain and not to the PP itself.

This account presupposes that the PP subjects in (28a,b) appear at S-structure in the position where Case is assigned. Although this assumption is straightforward in the inversion structure in (28b), it is necessary to also rule out the Topicalization derivation of (28a):

(29) *[Under the chair]_i [_S [e]_i pleased the cat]

We might derive this result by assuming that Reconstruction is obligatory in LF for PP arguments. Then if the CRP holds at all grammatical levels, topicalization of the PP subject in (29) would be ruled out on par with (28a,b).²¹ After Reconstruction applies, the PP Topic would acquire the nominative Case assigned to the subject position at S-structure, resulting in a CRP violation.²²

2.2 Suppose now that Reconstruction can take a PP from a non-A-position to any A-position with which it is co-indexed, subject to independent principles such as those relating to Case and θ -role assignment. Then if a topicalized PP were co-indexed with some other A-position in addition to the Case-marked subject position, Reconstruction need not result in a CRP violation, and the structure ought to be possible.

The English PP Preposing construction is an example of this. In this construction, a subcategorized PP moves into an empty subject position that has been vacated by subject postposing. Topicalization of the derived PP subject is obligatory, so a trace appears in subject position at S-structure:

(30) $PP_j [\sub S [e]_j^i [\bar{V}[\bar{V} V [e]_i] NP^i]$

The construction is exemplified in (31):

- (31) a. Into the room walked my brother Jack.
 b. On the table was put a valuable book
 c. Down the stairs fell the baby

Suppose that the structure shown in (30) is an accurate representation of the S-structures of the sentences in (31); justification will be provided shortly. The topicalized PPs must appear in \bar{V} at D-structure so as to satisfy the strict subcategorization requirements of the verb. After subject

postposing applies, the subject position is an empty category. The PP complement is not assigned Case; it is therefore permitted to move to the matrix subject position, provided that the VP-adjoined position is interpreted as the θ -position for the external (subject) argument; cf. Chapter 3, fn. 39. The trace position in VP is then interpreted as an anaphoric trace, by virtue of the fact that it is A-bound from subject position. The CRP does not permit the PP to remain in a position of nominative Case assignment at S-structure; therefore Topicalization is obligatory. Since the Topic is a PP, Reconstruction must apply, but the PP is co-indexed with two A-positions, only one of which is assigned Case. Therefore the PP returns to the original θ -position in VP, and the CRP is not violated.

If this derivation is correct, it provides strong support for the hypothesis that the subject position is not specified as an NP position by the rules of phrase structure; if it were so defined, then Emonds' (1970) principle of structure-preservation would be violated, as observed by Langendoen (1979). The derivation in (30) is permitted because the categorial status of the subject position is left unspecified; the principles of Case Theory invoked here do not prevent \bar{S} and NP from appearing in the subject position prior to the assignment of Case at S-structure, and precisely the correct class of PP "subjects" is allowed.

We now consider the empirical evidence supporting the S-structure assigned to this construction in (30). The categorial status of the PP Topic does not require justification; all of the verbs in (31) subcategorize for PP complements, which must appear in \bar{V} at D-structure:

- (32) a. My brother Jack [\bar{V} walked [into the room]]
 b. [e] was [put [a valuable book] [on the table]]
 c. The baby [fell [down the stairs]]

The extraposition of the subject to the postverbal VP-adjoined position is noncontroversial; the same structure is involved in the Presentational *there*-Insertion construction discussed in Chapter 3; cf. Guéron (1980), Rochemont (1978)²³. In (32b), the application of NP-movement in the passive construction actually feeds the extraposition of the subject to the position adjoined to VP. Two aspects of the derivation remain uncorroborated: the movement of the PP into subject position, and the subsequent topicalization, which is forced by the CRP.

The topicalized status of the preposed PP is fairly clear-cut: the PP Preposing construction shares precisely the external distribution of Topic constructions. Like other Topic constructions, PP Preposing can be embedded within an (asserted) tensed clause complement:

- (33) a. Bill says [that [such books]₁ [he only reads [e]₁ at home]]
 b. John says [that [near his house]₁ [[e], lies [e]₁ a buried treasure]]

Both of these Topic constructions are WH-islands, however, as in Chomsky (1977):

- (34) a. *Who does Bill say [that such books -- only reads at home] ?
 b. *What does John say [that near his house lies --] ?

Like other Topic constructions, PP Preposing cannot be embedded within an infinitival complement:

- (35) a. *I expect [[in the room] to be sitting my older brother]
 b. *I believe [[down the hill] to have rolled a ball]
- (36) a. *I expect [[this book] Bill to like]
 b. *I expect [[this book] PRO to like]
 c. *I believe [[down the hill] a ball to have rolled]

A similar story obtains with respect to other syntactic domains: where Topicalization is impossible, PP Preposing is too:

- (37) a. *[That this book, Bill liked --] is obvious
 b. *I don't believe John's claim [that this book, Bill liked --]
 c. *It shocked me [that this book, Bill liked --]
- (38) a. *[That in the chair was sitting my older brother] is obvious
 b. *I don't believe John's claim [that in the chair was sitting my older brother]
 c. *It shocked me [that in the chair was sitting my older brother]

It is worth pointing out that the PP Preposing construction is more constrained in this respect than the similar Presentation *there*-Insertion construction, which does not involve Topicalization:

- (39) a. ?I expect [there to be sitting in the room an old man]
 b. ?[That there was sitting in the room an old man] is obvious
 c. ?I don't believe John's claim [that there was sitting in the room an old man]

In other respects, *there*-Insertion is more constrained than PP Preposing; in particular, it is subject to the "definiteness" restriction discussed by Milsark (1974, 1977). Nevertheless, it has a preferred status in (39) over the PP Preposing construction in (35) and (38), since the CRP allows pleonastic *there* to remain in the true subject position at S-structure.

So it seems that the Topic status of the preposed PP is straightforward -- as we ought to expect, given the CRP. Must we assume, however, that the PP ever moves through subject position at all, as indicated in (30)? Consider the status of the subject position after extraposition has applied, prior to PP Preposing:

- (40) [e]ⁱ [[walked into the room] [my brother John]ⁱ]

English is not a language which allows free subject inversion or subject pro-drop (as is possible in languages such as Italian), and S-structures corresponding to (40) are ungrammatical, even when they are embedded within

Topic constructions:

- (41) a. *This room, [e]ⁱ walked into -- [my brother John]ⁱ
 b. *This is the book which [e]ⁱ read -- [my brother John]ⁱ

The ungrammaticality of the English sentences in (40-41) can be attributed to violations of the Empty Category Principle introduced by Chomsky (1981); the trace of subject postposing has no proper governor at S-structure, and the derivation is ruled out.²⁴ But the sentences in (31) are grammatical, implying that no ECP violation is involved here. If the preposed PP were to move directly to Topic position from VP, the contrast between (30) and (41) would be unexplained. But if the PP has moved through the empty position vacated by the postposed subject, it will be co-indexed with its trace in subject position, and proper government will obtain -- just as in other structures involving extraction from subject position through the adjacent COMP.

The assumption that the PP Preposing construction involves proper government of the subject position from COMP is confirmed by the fact that long extraction produces *that*-trace effects, as originally observed by Bresnan (1977):

- (42) a. [Who]₁ did you say [_S [e]₁ [[e]₁ read the book]]?
 b. *[Who]₁ did you say [_S that [[e]₁ read the book]]?
 (43) a. [Into which room]₁ did you say [_S [e]₁ [[e]₁ walked the children]]?
 b. *[Into which room]₁ did you say [_S that [[e]₁ walked the children]]?

In (43b), as in (42b), proper government of the subject position is blocked by the presence of the lexical complementizer *that* in COMP.²⁵ The correlation between the two structures only makes sense if the preposed PP has passed through subject position prior to moving into COMP; moreover, the ungrammaticality of (43b) cannot be attributed to a general prohibition

again long extraction of a PP from a *that*-clause complement, because direct topicalization from VP is allowed:

- (44) [Into which room]_i did you say [that [the children walked [e]_i] ?

Suppose, then, that PP Preposing does in fact involve movement of the PP through the subject position, as is permitted within the framework of a category-neutral base. Recall, however, that Reconstruction cannot take the PP back to the subject position at LF, so there must be a PP-trace in VP at S-structure. This trace is A-bound by the c-commanding PP-trace in subject position, so it cannot have the status of a variable without violating the Binding Theory. Therefore the account of PP Preposing developed here implies that the trace in ^{VP}NP must have the status of an anaphoric trace; i.e. there ought to be opacity effects resulting from the fact that the trace is subject to the condition on anaphors in the Binding Theory.

This prediction is borne out. First, there is a familiar contrast between finite and infinitival complements with respect to extraction from subject position:

- (45)a. [Into this house]_i [[e]_i appears [_S [e]_i to have walked [e]_i an alcoholic]]
 b. [Near the river]_i [[e]_i is likely [_S [e]_i to be lying [e]_i an old man]]
 (46)a. *[Into this house]_i [[e]_i appears [_S [e]_i walked [e]_i an alcoholic]]
 b. *[Near the river]_i [[e]_i is likely [_S [e]_i is lying [e]_i an old man]]

The facts can be deduced as follows. The empty subject position in the matrix must be properly governed from COMP by the PP Topic. Therefore the trace in the subject position of the complement is A-bound and must be an anaphor, as must the trace in the θ -position in VP. In (45), the governing category of the trace is the matrix clause, and it is A-bound by the matrix subject position, as required by the Binding Theory. But in (46), the trace in the

subject position of the complement is governed by INFL ; therefore its governing category is the complement clause itself. Since it is not A-bound within the clause, the condition on anaphors in the Binding Theory is violated.²⁶

The effects of the Binding Theory on the anaphoric PP-trace in VP are also observable with the Raising verb *be*, which takes a small clause complement:²⁷

- (47) a. There was [_V an alcoholic [sitting in the room]]
 b. There was [_A someone [drunk] at the party]
- (48) a. [An alcoholic]_i was [_V [e]_i [sitting in the room]]
 b. [Someone]_i was [_A [e]_i [drunk] at the party]

The presence of the subject in the small clause makes it count as an opacity domain; i.e. the clause is the governing category of any phrase governed by its head:

- (49) a. [The boys]_i made [_A [the girls]_j angry at [themselves]_j(*_i)]
 b. [The boys]_i seem to [the girls]_j [_A [e]_i similar to [each other]_i(*_j)]

Suppose now that PP Preposing applies to the structure in (47a). Movement to the matrix subject position does not violate the θ -criterion, since this is a non- θ -position, as indicated by the grammatical status of (48). But if the trace in VP is an anaphor, then direct movement to the matrix subject position violates the condition on anaphors in the Binding Theory, by virtue of the presence of the subject in the small clause:

- (50) *[In the room]_i [[e]_i was [_V [an alcoholic] [sitting [e]_i]]]

Although this structure violates the Binding Theory, there is a grammatical variant of (50) which does not. Specifically, if subject postposing applies within the small clause, then the subject position of the clause is left

empty, functioning as an "escape hatch" for the PP-trace to satisfy the Binding Theory:

(51) [In the room]_j [[e]_i was [[e]_jⁱ [[sitting [e]_j] [an alcoholic]ⁱ]]]

The PP-trace in the θ -position is bound by the trace in the subject position of the small clause; that trace in turn is bound by the trace in the matrix subject position.

The PP Preposing construction is of interest not only because it provides support for the category-neutral phrase structure component advocated in this study, but also because it shows that the ECP and the Binding Theory generalize across syntactic categories as well, at least with respect to trace.²⁸ It is only because the PP trace in the subject position is subject to the ECP that the *that*-trace effects show up in the long extraction structures in (43). Similarly, the fact that the PP-trace in the subcategorized θ -position is subject to the Binding Theory rules out (46) and (50): since the trace is A-bound, it cannot be a variable without violating the condition on names; therefore it has the status of an anaphor, and must be bound in its governing category.

Actually, the construction that I have referred to as PP Preposing is not strictly limited to PP arguments, but also involves AP and progressive VP complements in the cases referred to by Emonds (1976) as "Preposing Around *Be*":

- (52) a. [Sitting in the corner] was my cousin Sarah
 b. [More dangerous than any other animal of the forest] is the tiger

These constructions seem more limited than PP Preposing, however, suggesting that additional conditioning factors are involved, for which I will provide no account here.

3. Modifiers and Other Specifiers

3.1 Most discussions of modifying clauses have concentrated on relative clauses appearing in NP which restrict the scope of reference of the phrase. The occurrence of relative clauses is apparently conditioned in part by the prenominal determiners, and in some accounts this has been interpreted as showing that the relative clause originates at D-structure in the prenominal position. Jackendoff (1977) provides a number of cogent arguments against this type of account, and I will not attempt to recapitulate his conclusions here. It seems reasonable to assume that the position at the \bar{X} level to the right of \bar{X} is reserved for modifying clauses. Very little actually hangs on whether the left/right order is determined by the language-particular interpretation of the X-bar schema or by the rules mapping from S-structure to LF. The reason for this is that any category may function as a modifier, and any categorial phrase may itself contain a modifier, so that if a specific position for modifiers were determined in the base, it could be defined in category-neutral terms.

The fact that any category may contain a modifying relative clause is observed by Jackendoff (1977). More precisely, Jackendoff shows that appositive relatives generalize across syntactic categories:

- (53) a. [_{NP} John's book, [which I don't plan to read],] is about horses
 b. At least Anne is [_{AP} grateful for my help, [which you aren't]]
 c. We went [_{PP} from Aspen to Denver, [which seems like a long way],]
 in just four days
 d. Peter [_{VP} walks home from school every day, [which you ought to
 do too]]
 e. [_S Nancy washed all of the dishes, [which shocked me]]

Similarly, virtually any category may itself function as an appositive modifier:

- (54) a. [John, [_{NP} a nice guy if ever I met one],] is someone you have to meet.
 b. [Rachel, [_{AP} smarter than anyone else in her class],] decided to learn Tiberian Hebrew
 c. [John's cottage, [_{PP} off in the forest all by itself],] is a good place to work
 d. [Mary, [_{VP} eating a sandwich as I walked in],] didn't bother to say hello to me

It seems, then, that the distribution of appositive modifiers across syntactic categories poses no serious problems for the hypothesis of a category-neutral base.

3.2 The situation with restrictive modifiers is slightly more complex. Only NPs may contain restrictive relative clauses, but there is a logical explanation for this. We can think of a head noun as having an indeterminate scope of reference, ranging over entities or classes of entities. The function of a restrictive clause is to fix the scope of reference of the phrase, narrowing the reference to a specific subset of the referents allowed by the head.

On the other hand, the scope of reference of other categories is usually intrinsically fixed. The reference of a PP is determined by its NP object; the preposition simply indicates the relation to this point of reference. The reference of a clause -- i.e. the proposition that it denotes -- is determined by the combination of the reference of its arguments and of its tense. To the extent that it makes sense to talk about the "reference" of a VP or AP, this too seems to be determined by the head.

Nevertheless in certain circumstances it is possible for the categories AP, VP, and PP to contain restrictive modifiers as well. This is what happens in comparative and quantified structures involving "degree clauses", which are structurally parallel to restrictive clauses in NP,

as Jackendoff points out:²⁹

- (55) a. John is [_{AP} so afraid to lose [that he's freaking out]]
 b. He didn't [_{VP} say enough about why he did it [to justify himself]]
 c. We pushed him [_{PP} further into the room [than Harry had been]]

Jackendoff shows that these share a number of syntactic properties with restrictive modifiers. In particular, their occurrence is conditioned by the presence of certain specifiers such as *so*, *enough*, etc. Further, they always follow subcategorized complements, but precede appositive modifiers.

In fact, it seems that they serve a parallel logical function as well, since the degree specifiers in (55) render the reference of the head phrase indeterminate. Thus in (55a), *so afraid* is understood to indicate some undetermined point on a scale of degrees of fear; the purpose of the clausal complement is to fix the reference of the AP at some point on the scale. This differs from the simple adjectival head *afraid*, which indicates an absolute sense of fear, which can be understood to pick out some arbitrary point on the scale. Analogous remarks obtain for the restrictive modifiers of VP and PP in (55b) and (55c); they fix the value on some abstract scale of degree or frequency which serves as the [-N] counterpart to nominal reference. So it seems that at the appropriate level of abstraction, all the major syntactic categories are equivalent with respect to the syntactic position and logical function of their restrictive modifying phrases.

Finally, any syntactic category may function as a restrictive modifier:³⁰

- (56) a. [Anyone [_S who can understand this poem]] deserves a prize
 b. [Anyone [_{AP} capable of understanding this poem]] deserves a prize
 c. [A man [_{VP} wearing a suit and tie]] just walked into the club
 d. [A man [_{PP} in a suit and tie]] just walked into the club

Actually, the categorial status of the "reduced" relative clauses in (56b-d) is not entirely straightforward. As with the small clause adjuncts discussed in Section 1.4, these modifiers are not subcategorized for, so their categorial status is not determined by requirements of the nominal matrix in which they appear. If the phonologically null subject position in these clauses is PRO, then the clauses presumably have the same categorial status as the small clause adjuncts; i.e. they could not be projections of AP, VP, PP, etc., without resulting in PRO being governed. On the other hand, it is not clear how to block the head noun itself from governing the subject position across the clause boundary, suggesting that the subject position may be occupied by an empty category rather than by PRO. If that were the case, then the modifying clauses might just as easily have the status of AP, VP, PP, etc., since the head noun ought to be able to govern the clausal subject position across any one of these categories.³¹ Presumably the child does not suffer from the same inability to assign an unambiguous categorial status to these "reduced" modifiers, suggesting that some general principle ought to rule out one or the other option; I have no specific proposals in this domain, however.

3.3 So far we have observed that the X-bar schema for the specifier level allows for two positions that can be defined in category-neutral terms. The subject position precedes the head phrase \bar{X} , while the position for modifiers follows it:

(57) [\bar{X} SUBJ - \bar{X} - MOD]

From the perspective of the theory of the base, it is immaterial whether these positions are actually specified as such by the language-particular instantiation of the X-bar system; it could turn out to be the case that other components of grammar determine this order.

For instance, the position of the subject could be determined entirely by the adjacency condition on Case assignment. A lexical NP subject of an infinitival clause must appear to the left of the predicate phrase in order to be assigned Case either by the complementizer *for* or by the governing verb in an Exceptional Case-marking construction. This is also true for the lexical subject of a small clause complement, which must be assigned Case by the governing verb. Similar remarks obtain for the subject of NP, if the assignment of genitive Case is governed by the principles discussed in the Appendix to Chapter 3. Finally, if nominative Case is assigned under adjacency, then the position of the subject of a tensed clause could be determined by the position of INFL or COMP, depending on which of these positions is the focus of the governing head.³² This type of account would imply that the position of a PRO or NP-trace subject is left indeterminate; since neither PRO nor NP-trace is assigned case, it could appear either to the left or to the right of the predicate phrase.

It is less clear how the position of the modifiers could be determined independent of the phrase-structure schema. Perhaps the governing principles belong to the theory of Control, if \bar{X} functions as a kind of controller of the WH-phrase or PRO subject of the modifying clause. Then the position of the modifier would be due to the same principle which apparently requires a controlling PP to precede the infinitival complement in Object Control structures.³³ Similarly, the peripheral position of appositive relative clauses may be due to principles of pronominal reference, if the relative pronoun in an appositive clause is actually a pronominal, as suggested by Jackendoff (1977).³⁴

In this discussion, I have ignored the position of other specifier phrases such as PPs and adverbials of time and place. These we could assume

quite naturally to be freely ordered within the \bar{X} level, analogous to the unspecified order of subcategorized complements within \bar{X} . These specifiers can occur either as constituents of S or as constituents of VP; the relevant evidence comes from structures involving adjunction to VP, where the adjoined constituent may either precede or follow the specifier:

- (58) a. There [_{VP} arrived from Canada] two friends of mine] last week
 b. There [_{VP} [arrived from Canada] last week] two friends of mine]
 (59) a. John [_{VP} sent [e]_i to Peter] [a book about rodents]_i] last week
 b. John [_{VP} [sent [e]_i to Peter] last week] [a book about rodents]_i]

Although there are other possible explanations for the variation illustrated in (58-59), the most natural account appears to be that which permits the specifier phrase to appear at D-structure either in VP or in S.³⁵

4. Specifiers of the Head

4.1 In this section, I consider two classes of specifiers which appear to pose significant problems for the assumption that the base rules do not designate special positions for specifiers of a particular categorial type. The first case involves prenominal adjectives. Unlike all other restrictive modifiers, simple adjectives appear in the position preceding a head noun:³⁶

- (60) a. [the [big] man]
 b. [the [old] [grey] mare]
 (61) a. [the man [from India]]
 b. [the man [living next door]]
 c. [any man [older than me]]
 d. *[any [older than me] man]

The fact that only adjectives may occur in prenominal position appears to call for a special position reserved for an AP modifier, as proposed by Jackendoff (1972, 1977). This assumption appears to derive support from

Jackendoff's (1972) observation that certain adjectives such as *mere* and *utter* may only occur in prenominal position:

- (62) a. He is [a [mere] boy]
 b. This apartment is [an [utter] mess]
- (63) a. *This boy is [mere]
 b. *This mess is [utter]

Unless the transformational component of the grammar were enriched in its descriptive power to allow for the formulation of an adjectival preposing rule of the type discussed in Chapter 1, these facts provide *prima facie* evidence for a categorial rule of NP defining a position for an AP modifier preceding the head.

Clearly, this is inconsistent with the working hypothesis of this study. It seems that there is no way, however, to get around the categorial asymmetry in this case. It is a simple fact that only adjectival modifiers may precede the head, and I know of no obvious examples of nominal constructions that could be reanalyzed so as to reveal hidden PP, VP, or \bar{S} modifiers in prenominal position. Moreover, the categorial asymmetry is not limited to the identity of the modifier, but extends to the phrase containing it: although APs may appear as modifiers of other categories, the occurrence of adjectival modifiers in the position preceding the head seems to be limited to NP.

Actually, prenominal adjectives pose still another problem for assumptions about X-bar structure, even within the theory of the Categorial component assumed by Jackendoff (1977). Recall Jackendoff's principle that every non-head constituent of a phrase must be a maximal projection. If the base rules were responsible for the prenominal placement of adjectival modifiers, this principle would be violated, since full APs may not precede

the head. Unless the theory of grammar were weakened so as to allow for the formulation of an obligatory transformational rule extraposing "heavy" APs from prenominal position, it would be necessary for the categorial rule to define the prenominal modifier position as being reserved for a non-maximal projection of A.³⁷

These considerations suggest that some other component of grammar may actually be responsible for the placement of adjectives in prenominal position. At this point, it is worthwhile drawing an analogy with prenominal clitics in languages such as French or Italian. In many respects, clitics share essential properties with the English prenominal adjectives. Just as the prenominal adjectives correspond in function to postnominal modifying phrases, so the preverbal clitics correspond in function to postverbal arguments appearing in \bar{V} . Furthermore, the fact that clitic pronouns must appear adjoined to the verb and cannot appear as independent phrases in \bar{V} is directly parallel to the fact that simple adjectives may not appear in postnominal position; in each case, the position preceding the head seems to be reserved for a non-maximal projection of the category -- either a simple adjective or a pronoun. In fact, there are even clitic counterparts to the English adjectives *utter* and *mere*: the French reflexive clitic *se* is strictly limited to the preverbal position in an analogous fashion.

It has long been recognized that clitics and the verb to which they are adjoined form a single phonological word. Moreover, Perlmutter (1971) observes that the actual order of the clitics in preverbal position is highly arbitrary, being conditioned in some cases by phonological factors. Perlmutter's discussion of these facts is illuminating, and bears repeating:

The parasitic behavior of clitics at the word level is what defines them as clitics. It should, therefore, not be surprising if an explanation for their being subject to surface structure constraints were to follow from their basic, defining property. ...whereas many languages have phenomena like "free word order", there are no languages in which the order of morphemes within the word is free. Since clitics form a single word with the word on which they lean, the fact that their relative order is fixed may be but a special case of the fixed order of morphemes within the word. (p. 65)

Within the framework of a theory of grammar which contains a word-formation component, the natural way to capture this insight is to assume that clitics are adjoined to verbal stems by means of word-formation rules, rather than by rules of syntax. Although they are linked with syntactic argument positions in \bar{V} , this can be accounted for in terms of the theory of government, along the lines suggested by Borer (1981); cf. Aoun (1979), Jaeggli (1980), Chomsky (1981), and Chapter 5 below.

The parallels holding between clitics and prenominal adjectives can be captured by assuming that the adjectives are also adjoined to the nominal head of NP by means of a rule of word-formation. This word-formation rule would create complex nouns with the structure in (64), analogous to those found in languages such as Sanskrit:

(64) $[_N A - N]$

The fact that prenominal adjectives can be "stacked" suggests that the rule can apply iteratively to its own output. By positing a word-formation rule to derive the prenominal placement of adjectives, we avoid having to weaken the theory of phrase structure so as to allow for any number of arbitrary stipulations at the phrasal level. Categorical asymmetries are known proper-

ties of word-formation rules, so it does not entail any weakening of grammatical theory to attribute the curious properties of the prenominal adjectives to the effects of this component.

It has been observed, e.g. by Chomsky and Halle (1968), that the stress pattern of the prenominal adjective structures in (60) differs from that of "true" compounding in structures such as (65):

- (65) a. [the White House]
b. [a hot dog]

Whereas stress falls on the adjective in (65), it falls on the noun in (60); this has sometimes been taken as evidence for phrasal structure in (60). Clearly this is not a necessary assumption, however, since it is known that various morphological affixes have idiosyncratic effects on stress. It is sufficient to suppose that the structures in (65) are not cyclically derived to allow for the two structures to be distinguished.

In fact there is further evidence that the prenominal adjectives have a status roughly equivalent to that of clitics. Perlmutter (1971) observes that prenominal adjectives appear in specific invariant orders that are directly analogous to those observed with preverbal clitics:

- (66) a. [all the red brick houses]
b. [the lovely narrow houses]
c. [all narrow brick houses]
d. [all the red houses]
- (67) a. *[red the houses]
b. *[red lovely houses]
c. *[narrow all houses]
d. *[all the lovely red narrow brick houses]

Perlmutter concludes from this that positive surface filters are required

beyond the level of the word; however, if the pronominal adjectives are actually derived by means of word-formation rules, then the strongest form of his hypothesis can be maintained.

Another fact which suggests that pronominal adjectives are actually incorporated into a complex noun has to do with the "pronominal epithets" first discussed by Jackendoff (1972). These noun phrases are apparently treated as names by the Binding Theory, but in conjoined structures, they seem to function as pronouns:

- (68) a. I tried to visit [the mayor]_i last week, but [the man]_i refused to talk to me
 b. John almost caught [a gigantic tuna]_i, but [the fish]_i escaped at the last minute

Pronominal epithets must always consist of a simple definite determiner and noun, and may never include a postnominal modifier:

- (69) a. *I tried to visit [the mayor]_i last week, but [the man angry at his constituents]_i refused to see me
 b. *John almost caught [a gigantic tuna]_i, but [the fish on the end of the line]_i escaped at the last minute

Nevertheless, a pronominal epithet is free to include pronominal adjectives:

- (70) a. I tried to visit [the mayor]_i last week, but [the angry old man]_i refused to talk to me
 b. John almost caught [a gigantic tuna]_i, but [the resourceful fish]_i escaped at the last minute

This suggests that pronominal adjectives are not treated as true restrictive modifiers; instead, they are interpreted by a special rule applying to the substructure of the nominal head.

One final argument for the incorporated status of the pronominal adjectives concerns the phonological shape of the determiners. Rotenberg (1977)

argues that the indefinite article in English has the status of a clitic; his account could presumably be extended to cover the definite article as well, which is subject to an analogous phonological alternation.³⁸ The idiosyncratic phonological alternations displayed by the articles is reminiscent of the type of alternation commonly found with morphemes inside a word; this makes sense if they are actually adjoined to the noun by means of a word-formation rule. The articles may be adjoined to adjectives as well -- although only if they appear in prenominal position. But this is just the result that we expect, if the prenominal adjectives are actually within the structure of the noun.

4.2 Another case of arbitrary specifier order appears in the preverbal auxiliary system, first treated within the framework of generative grammar by Chomsky (1957). The apparently arbitrary properties of the English auxiliary system have proved baffling to syntacticians for many years; although subsequent accounts have attempted to improve on the descriptive coverage offered by Chomsky's original phrase-structure formula, very few of the properties of this system have been successfully derived from general principles of Universal Grammar.

It is reasonable to conjecture that the arbitrary complexities of the English auxiliary system are also due to the operation of word-formation rules. As Morris Halle has observed (personal communication), it is surely not an accident that the grammatical functions served by the auxiliary system are encoded in the form of morphological affixes in many other languages. Viewed in these terms, the tendency of the verbs *be* and *have* to appear within the auxiliary complex -- even when they function as main verbs -- might

be interpreted as being analogous to the apparent "movement" of subparts of the Dutch verbal complex from the \bar{V} -final head position to the \bar{V} -initial position in main clauses.³⁹

Of course these remarks are not intended to be construed as a rigorous account of the complex phenomena associated with the auxiliary system. Clearly the English auxiliaries differ from true morphological affixes in that they bear inflectional affixes themselves, and are treated as words by the rules of phonology. Nevertheless, an approach along these lines appears to be called for if the auxiliary system is to be accounted for within the framework of a theory of grammar which does not include a categorial component to derive the constituent structure of individual phrases. A more extensive analysis of an analogous phenomenon is provided in the next chapter.

FOOTNOTES: CHAPTER 4

1. Most of the material in the first section of this chapter is drawn from Stowell (to appear). See also Manzini (1980) for a very interesting discussion of related issues. Manzini independently arrived at a number of the conclusions presented here.
 2. The relevant feature is his [+SUBJ] feature, which is shared by NP and VP. (Recall that Jackendoff treats S as a projection of V.) See Chapter 1 for discussion.
 3. See Koster and May (to appear) and Chomsky (1981) for discussion.
 4. Recall that an analogous account in terms of the Case filter of Chomsky (1980) derives equivalent results. See Chapter 3, Section 3 for discussion of the "visibility" condition.
 5. See footnote 4 above.
 6. See Chapter 1, Section 3, and the Appendix to Chapter 3.
 7. One exception is the small clause construction discussed below. Here, *of*-insertion may not apply to an extraposed subject, for reasons which remain unclear.
 8. The perception verbs also allow progressive and passive participial complements. In the following discussion I have omitted commentary on predicative nominal small clause complements such as (i)
- (i) I consider [John - a nice guy]

These examples raise a significant issue concerning the distinction between the genitive subject and the objective subject in (ii):

(11) I consider [John - Bill's best friend]

For discussion, see Stowell (to appear).

9. In particular, the solution requires reference to specific formulae in categorial rules, and the analysis of the small clause complements violates the Projection Principle.

10. Unlike the small clause complements, the Double Object construction is dependent upon a special word-formation rule that is not found in languages such as French. The Double Object construction is also limited to a phonologically defined verbal stem class, and the first object has special limitations with respect to movement rules that do not apply to the subject of a small clause. See Chapter 5 for discussion.

11. Small clauses are tenseless, and thus differ from true \bar{S} clauses, which always contain a tense operator taking scope over the proposition; cf. Manzini (1981).

12. An empty category may appear only in a position that is properly governed, by virtue of the ECP. See Chapter 6 for discussion.

13. It may be that the lack of PP complements with the "true" Raising verbs is accidental. Note that *keep* has the thematic properties of a Raising verb in sentences such as (1):

(1) [John]_i kept [pp [e]_i inside the house]

This verb does not subcategorize for an \bar{S} complement, however; so infinitival complements do not appear with it.

14. The structure in (22b) is not derived from (21b) by means of an ob-

ligatory rule of *to*-insertion. The verbs *hear* and *see* (but not *watch*) also subcategorize for \bar{S} complements, and so the infinitival structure in (22) is possible. See Stowell (to appear) for discussion.

15. For an alternative account of examples such as these, see Williams (1980a).

16. Perception verbs in French do allow complements comparable to those found in (25). Since French does not distinguish phonologically between an infinitival form of the verb and the verbal stem itself, we might view the perception verb complements as projections of V, like their English counterparts in (16).

17. This problem was noted by Chomsky (1981), and by an anonymous reviewer of Stowell (to appear).

18. The fact that small clause boundaries do not act as barriers to government raises an interesting issue concerning the status of maximal projections as barriers to government. Perhaps, as Chomsky (1981) suggests, the small clauses are not maximal projections; but it is unclear what counts as the maximal projection of AP or PP if it is not the projection that contains the subject. Note that the problem is not limited to small clauses; if \bar{S} is a projection of COMP, as suggested in Chapter 6, then S is the maximal projection of INFL, despite the fact that it does not block government from COMP.

19. We might think of the INFL of a small clause adjunct as containing a PRO-tense; this would account for the fact that the tense of the small clause adjunct is always understood to be controlled by the tense of the matrix in which it appears.

20. Note that identificational structures must have a special means of assigning a θ -role to the subject position, if a PP argument in this position can be assigned a θ -role. Recall that a PP may not appear in the subject position of the infinitival complement of a Raising verb, even though it is assigned no Case. Apparently a PP argument is only intrinsically "visible" for θ -role assignment when it appears as a subcategorized complement, as observed in Chapter 3, Section 4.
21. Note that if the CRP applies at all grammatical levels, no problem arises at D-structure, since grammatical Case is not assigned until S-structure. Note, however, that if "Quirky Case" is assigned at D-structure, then we predict that \bar{S} should never be able to appear in a position that is assigned Quirky Case by a verb.
22. Note that even if Case assignment is optional, the same results follow from the θ -criterion, since a PP that appears in the subject position is not intrinsically visible for θ -role assignment.
23. Further evidence that the postverbal subject is adjoined to VP is provided in Chapter 6, fn. 13.
24. A slightly different account of the ungrammaticality of these structures is provided by Chomsky (1981), who introduces a contextual definition of PRO. This revision does not affect the structure of our argument, since the distinction between (30) and (41) follows in an analogous fashion in this account.
25. On the issue of proper government from COMP, see Chomsky (1981), and Chapter 6 below. See also Kayne (1980), Pesetsky (to appear), and Taraldsen (1978) for related discussion in the framework of the theory of Chomsky (1980).

26. An equivalent account can be derived within the revised version of the Binding Theory stated in terms of the notion "binding category" developed in Chomsky (1981).

27. On the analysis of *be* as a Raising verb, see Stowell (1978, 1979), Borer (1979), and Burzio (1981). See also Couquaux (to appear) for a number of interesting arguments for an analogous account of the French copular verb *être*.

28. Our account argues against the proposal of Jaeggli (1980) that the ECP does not apply to PP-trace. See also Chapter 6 for discussion.

29. The examples below are drawn from Jackendoff (1977). Jackendoff's discussion is based partly on previous research in this area by J. Bowers.

30. For some reason, NP may not function as a restrictive modifier, analogous to its use as an appositive modifier in (54), in the normal case. Sentences like the following, suggested to me by D. Pesetsky, may represent such a use:

Mary prefers Pushkin the lyric poet to Pushkin the prose writer

31. On government across small clause boundaries, see footnote 18.

32. See Chapter 6 for a discussion of the head position of \bar{S} , and the relationship between COMP and INFL. Recall that in Malagasy, the subject appears on the other side of the predicate phrase in the Exceptional Case-marking construction from where it appears in a tensed clause. See Chapter 3, Section 6 for discussion.

33. See Chapter 3, fn. 58 for discussion of this point.

34. Suppose that the restrictive modifier fixes the reference of the NP in which it appears. Then if the pronominal WH-phrase in an appositive clause requires an antecedent that has a fixed scope of reference, the restrictive modifier will have to appear "inside" the appositive.

35. Alternatively, we might assume that the specifiers may be base-adjoined to any projection of V. Those which are adjoined to the head (X^0) would be adjoined by means of word-formation rules; see Section 4 for discussion.

36. Actually, participial modifiers may also precede the head noun; this is irrelevant to the main point of our argument, however.

37. Adjectival specifiers such as *quite* and *very* may accompany the pronominal adjective. I assume that these are base-adjoined to the adjectival head.

38. We might interpret the definite article *the* as a subject clitic within NP. This might account for the fact that a genitive NP subject may never co-occur in NP with a definite article. Note also that the definite article may never occur in the subject position of a gerund; this follows if it can only appear when it is adjoined to a noun by a rule of word-formation.

39. See Chapter 3, Section 2 for discussion.

CHAPTER FIVE: WORD-FORMATION RULES

1. Double Object and Verb-Particle Constructions

1.1. In our discussion of the order of complement phrases in Chapter 3, we saw that it was possible to account for the distribution of NP, \bar{S} , and PP complements in terms of the interaction of unordered strict sub-categorization frames with the principles of Case and θ -role assignment. In Chapter 4, we extended our account of constituent order in \bar{X} by interpreting the "PRED" position as being the head phrase of a small clause complement.

There are two English complementation structures that I have neglected to discuss so far, however. These are the Double Object construction and the Verb-Particle construction, exemplified in (1) and (2), respectively:

- (1) a. Wayne sent [Robert] [a telegram]
Debbie gave [Anne] [a record]
cf. b. Wayne sent a telegram to Robert
Debbie gave a record to Anne.
- (2) a. Kevin turned [on] [the light]
Janice cut [up] [the cabbage]
b. Kevin turned [the light] [on]
Janice cut [the cabbage] [up]

Each of these constructions poses potentially serious problems for the theory of a category-neutral base component that has been developed in the preceding chapters.

First, both constructions appear to be primarily limited to the verbal system, and do not extend straightforwardly to other categories. For example, both (1a) and (2b) have no counterparts in derived nominals:

- (3) a. *[the sending (of) Robert (cf) a telegram]

b. *[the turning (of) the light on]

One might be tempted to account for this in terms of strict subcategorization, but it would be necessary to stipulate that in just these constructions, the subcategorization frames of derived nominals are not equivalent to those of the verbs on which they are based -- contrary to what we should expect, given the "Remarks" theory of the lexicon. Moreover, if the (a) sentences in (1)-(2) are to be accounted for in terms of the same subcategorization frames as the (b) sentences -- as is implied by the fact that they correspond to identical θ -grids -- then it would be impossible to rule out the derived nominals in (3) without also ruling out their grammatical counterparts in (4):

- (4) a. [the sending of a telegram to Robert]
 b. [the turning on of the light]

In a theory which allows for category-specific base rules, it is a simple matter to account for this categorial asymmetry. Specifically, given a base rule for \bar{V} which defines (among others) the expansion of terms represented in (5), one could relate the (a) and (b) pairs in (1)-(2) by means of a structure-preserving syntactic movement rule, as observed by Emonds (1972, 1976); cf. Jackendoff (1977).

- (5) $\bar{V} \longrightarrow V - (NP) - (Prt) - (NP) - (PP) \dots$

Specifically, (1a) could be derived from (1b) by taking the object of *to* from the PP position to the first NP position in (5), given a rule deleting the dummy preposition. Similarly, (2a-b) could be transformationally related by taking the object from one of the NP positions in (5) to the other. The fact that these constructions do not generalize to other categories could be accounted for simply by assuming that the first NP position only appears

in the categorial rule for \bar{V} . In the theory of grammar assumed here, however, this option is unavailable.

The second problem with these constructions is that they appear to involve straightforward violations of the adjacency condition on Case assignment. Specifically, the second object NP in (1a) is separated from the governing verb by another NP, while the object NP in (2a) is separated from the verb by a particle. Recall that in order to account for the fact that an NP object always appears immediately after its governing verb in English, we had to invoke a very strict interpretation of the adjacency condition, since even intervening manner adverbials are sufficient to block it.

One might try to get around this problem by assuming that the non-adjacent NPs in (1a) and (2a) are inherently Case-marked, analogous to the situation in non-configurational languages. Then the verb would subcategorize for the inherent Case rather than assign it, and adjacency would not be required. But this would predict that the order of this NP should be free in \bar{V} with respect to other material in the complement phrase, and this is incorrect (abstracting away from Focus NP Shift):

- (6) a. *Wayne sent Robert suddenly a telegram
- b. *Debby gave Anne secretly a record
- c. *Kevin turned on immediately the light
- d. *Janice cut up carelessly the cabbage

In other words, although the NP is not adjacent to the verb, it is "as close as it can be", as noted by Chomsky (1981). Chomsky suggests that the rule assigning Case to the second object in a Double Object construction is allowed to apply across an object NP (thus accounting for (1a)) even though it is blocked from applying across any other type of constituent (PP,

Adv, etc.), thus accounting for the fact that object NPs are normally adjacent to the verb. But this would be a surprising result, as noted by H. Lasnik (personal communication), since it is precisely the opposite of what is normally allowed in the case of nonlocal rule application. When phonological rules apply in nonadjacent domains, it is usually by disregarding irrelevant material to which the rule could not in principle apply, as in the case of vowel harmony rules which operate freely across consonant clusters. Moreover, the ability of Italian and Dutch Case assignment to apply across manner adverbials (but not across other arguments) can be most naturally accounted for by assuming that the rule applies on the argument projection, as observed in Chapter 3. But this type of account is unavailable for the Double Object construction, since the element that is supposed to be disregarded (the first object) is itself an argument of the verb, and cannot be eliminated from the relevant projection. Moreover, it is not clear how this account could be extended to cover the Verb-Particle constructions, especially if particles are intransitive prepositions, as proposed by Emonds (1972). These considerations suggest that the adjacency condition is satisfied in (1a) and (2a) in some other way.

It is worth pointing out that this problem does not arise in a Standard Theory account of these constructions. Given the existence of a categorial component, the adjacency of the first object can be captured by placing the first NP adjacent to the verb in the rule expansion of (5); since this stipulation makes no prediction at all about the occurrence of other NPs in \bar{V} , no problem arises with respect to nonadjacent objects.¹

A third problem posed by the constructions in (1) and (2) is that they have no direct counterparts in many other languages (e.g. French and Italian). Even Dutch, which does have Verb-Particle constructions

analogous to (2a), has no particle-movement counterpart to (2b), as observed by Koster (1975). Once again, this appears to call for a special wrinkle in the expansion of the English categorial rule for \bar{V} . Thus accounting for two apparently arbitrary properties of English in terms of a simple elaboration in the phrase structure schema.

One final difficulty is limited to the Double Object construction. In the theory that we have developed thus far, we have assumed that strict subcategorization frames are unordered, and that the order of complements is imposed by principles of Case theory. If each of the complement θ -roles in (1) is associated with subcategorization features for NP, then we ought to expect the two arguments to be interchangeable. In other words, the sentences in (1a) should have the variants in (7):

- (7) a. *Wayne sent [a telegram] [Robert]
 b. *Debbie gave [a record] [Anne]

But these sentences are ungrammatical, suggesting either (i) that subcategorization frames are ordered or (ii) that the two NP positions in (5) have some special distinguishing property that the subcategorization frames are able to refer to. Note that under the theory which claims that (1a) is transformationally derived from (1b), the D-structure status of the first NP as an object of *to* provides the necessary distinction.

Actually, these two constructions also display a bewildering array of other mysteries which we will consider in some detail below. But the problems enumerated above have a special status, in that they only arise in the context of the theory of phrase structure advocated in the preceding chapters; in fact, most of them were not even considered to be serious issues in previous accounts.

1.2. All of these difficulties can be traced to a single assumption that virtually all previous analyses of these constructions have taken for granted, an assumption that is perhaps so obvious that it has never been seriously questioned: namely, that both NP "objects" in (1), as well as the particles in (2), are actually complements of the verb, appearing as constituent phrases in \bar{V} .

Suppose, however, that we take the adjacency condition on Case assignment seriously, and assume that the NP object in (2a) and the second NP object in (1a) really are adjacent to their governing verbs. It would then follow that the true constituent structures of (1a) and (2a) would be those of (8a,b) respectively:²

- (8) a. Wayne [\bar{V} [V sent - Robert] [a telegram]]
 b. Kevin [\bar{V} [V turned - on] [the light]

In other words, if we were to assume that each of these structures involved complex verbs with internal NPs or Particles, then the adjacency problem would disappear. The complex verbs would assign Case to the object NPs under adjacency, and the internal NP in (8a) would have the status of an incorporated object, analogous to a clitic in a language such as French, Spanish, or Italian. These complex verbs would presumably be derived by rules of word-formation similar to the Romance rules which incorporate clitics into the verbal complex and to the English rules involving the preverbal auxiliary complex and prenominal adjectives. Specifically, we can suppose that the grammar of English contains rules of word-formation which produce derived structures corresponding to (9):

- (9) a. [V V - NP]
 b. [V V - Prt]

The structure in (9a) is unusual, in that it involves a phrasal category (NP) being adjoined to a stem (V) by means of a rule of word-formation. Such structures have not been attested elsewhere, but this may simply reflect the fact that previous studies of word-formation have presupposed that phonological word-boundaries exhaustively define the domains within which such rules may apply. We have already seen in previous chapters that the notion of a syntactic word is not necessarily equivalent to that of a phonological word; we might therefore suppose that the rules deriving the complex verbs in (9), like those involved with pre-verbal auxiliaries and prenominal adjectives belong to a component of extended word-formation rules.

The structure in (9b) has sometimes been considered for verb-particle constructions in previous studies, but it has usually been rejected because of the existence of the corresponding structures in (2b). Almost every analysis of this construction has assumed that both structures should be captured in terms of a single subcategorization frame, and it has usually been assumed that the two structures should be transformationally related.³ Intuitively, the verb-particle pair functions as a single semantic word, especially in idiomatic pairs such as *turn on* 'excite', or *put off* 'delay', supporting the structure of (9b). But if (2b) is to be transformationally derived from (2a), then the structure in (9b) is impossible, unless one makes the otherwise unwarranted assumption that syntactic movement rules can apply to subparts of a syntactic word.

Given the existence of the NP-Incorporation rule, which is involved in the derivation of the Double Object construction in (8a), it is possible to resolve this conflict. Specifically, we can assume that (2b) actually has

the structure in (10), where the word-formation rule of Particle-Incorporation has applied to the output of NP-Incorporation:

- (10) a. [_V [_V V - NP] - Prt]
 b. Kevin [_V [_V turned - the light] - on]]

Thus we need not assume that the grammar of English contains a language-specific rule of Particle Movement; instead, the possibility of having the "movement" structure in (2b) follows from the fact that English has the word-formation rules of NP-Incorporation and Particle Incorporation. These rules can either apply separately, yielding (1a) and (2a) respectively, or simultaneously to a single verb, yielding (2b), i.e., (10).⁴

1.3. Let us now return to the problems raised in Section 1.1. We have already seen that the complex-verb analysis provides a simple solution to the apparent violations of the adjacency condition on Case assignment. The first "object" in (1a) is part of the verbal complex, and therefore can "absorb" the Case features, just as a clitic does in a language such as French or Italian; cf. Aoun (1979) on Case absorption. The second NP is the true syntactic object of the complex verb, and it is assigned Case under adjacency. An analogous story holds for the true object NP in (2a) and the incorporated NP in (2b).

Consider now the cross-categorial asymmetry. This can be accounted for by assuming that the NP-Incorporation rule does not extend to other categories. Virtually every language has distinct morphological patterns for each category, and there is no reason why English should be an exception to this. No one has ever seriously worried about the fact that French lacks a series of prenominal clitics parallel to the preverbal series; this is simply not the sort of cross-categorial parallelism that necessarily occurs

in human languages.⁵ Note that by assuming that NP-Incorporation does not apply to nonverbal stems, we account simultaneously for the ungrammaticality of (3a) and (3b), since both structures would have to involve this rule.⁶ In contrast, (4a) involves no incorporation rule at all, while (4b) presumably involves Particle Incorporation, suggesting that the rule also applies to *ing*-nominals.

By invoking a word-formation rule in the derivation of (1a) and (2a,b), we also arrive at a reasonably natural means of accounting for the fact that such constructions do not appear in French or Italian. Word-formation rules are notoriously language-specific, and there is no reason to suppose that Particle-Incorporation or NP-Incorporation should necessarily be found in every language. On the other hand, Particle Incorporation is attested in Dutch; cf. fn. 4. Moreover, French and Italian really do have counterparts to the NP-Incorporation rule, at a more abstract level. Specifically, the preverbal clitics in these languages correspond directly to the incorporated NPs in English, differing primarily in that clitics may only include pronominal features, whereas the English version of the "clitic" may be a lexical noun phrase. The English NP-Incorporation structures thus represent an extreme version of the noun incorporation that is common in the Algonquian languages.

The parallel with clitic constructions also provides a way of accounting for the (a) and (b) pairs in (1) and (2) by means of a single subcategorization frame for each verb. According to Borer's (1981) analysis of clitic constructions, the clitics are adjoined to the verbal stem by means of a word-formation rule, thus accounting for their arbitrary order; but each clitic governs a specific subcategorized position in \bar{V} in which a lexical NP would normally appear if the clitic were absent. The subcatego-

alized position in \bar{V} is the θ -position which must appear at D-structure, S-structure, and LF, by virtue of the Projection Principle. Thus although clitics and lexical NPs do not occur in the same structural positions, they are both dependent upon the same strict subcategorization frames.

We can adopt an analogous account for the NP-Incorporation cases in (1a) and (2b), which will have the structures shown in (11):

- (11) a. Wayne [\bar{V} [V sent - [Robert]_i] - [a telegram] - [e]_i]
 b. Kevin [\bar{V} [V turned - [the light]_i - on] - [e]_i]

In (11), the phonetically-null NP in \bar{V} is the θ -position; this NP must appear at D-structure, S-structure, and LF in order to satisfy the Projection Principle. The incorporated NP "absorbs" the Case feature that would normally be assigned to the θ -position, but the Case feature is A-associated with the θ -position, so θ -role assignment is possible.⁷ The position occupied by the phonetically-null NP in (11a) is the position occupied by the indirect object phrase *to Robert* in (12a); similarly, the empty NP position in (11b) is occupied by the direct object *the light* in (12b):

- (12) a. Wayne [\bar{V} [V sent] - [a telegram] - [to Robert]]
 b. Kevin [\bar{V} [V turned - on] - [the light]

In each of the sentences in (12), the direct object is assigned Case under adjacency. But the indirect object in (12a) is not adjacent to the verb, so the dummy Case-marker *to* is required; the rule responsible for *to*-Insertion is presumably analogous to similar rules of *a*-Insertion in the Romance languages. Thus the Double Object and Verb-Particle constructions can both be accounted for without invoking additional strict subcategorization frames, as required by the theory of θ -grids developed in Chapter 1.

The NP-Incorporation analysis of the Double Object construction also explains why the NPs cannot switch places, as in (7). Since the first of these NPs is actually analogous to a clitic, it must be associated with a particular position in the θ -grid. This is required independently in pronominal clitic constructions in the Romance languages, where there are specific positions reserved for direct object clitics, indirect object clitics, locative clitics, etc. It is immaterial to our present concerns how the link between grammatical functions and specific incorporated positions is achieved; whatever turns out to be the correct account for clitic constructions will carry over straightforwardly to the NP-Incorporation constructions as well.

1.4. It might be objected that this analysis of the Double Object and Verb-Particle constructions simply moves their arbitrary properties from one component of the grammar to another, without any conceptual gain. But this would be a misguided criticism, in my opinion. It is a simple fact that many aspects of morphological structure are arbitrary: each language has its own conventions for affixation, cliticization, incorporation, and compounding. The internal structure of words is characterized by arbitrary and invariant order, even in non-configurational languages. Moreover, word-formation rules typically display a lack of cross-categorical parallelism, partial productivity, and idiosyncratic differences from one language to the next. The rules of core grammar normally have properties which derive from the principles of Case theory, X-bar theory, etc. Since Double Object constructions and Verb-Particle constructions display the characteristic symptoms of word-formation rules, it is only rational to conclude that such rules are responsible for deriving the constructions. The alternative to this move

is to conclude that the theory of syntax should be weakened so as to blur the distinctions between otherwise well-defined components of grammar. In other words, to argue that the analysis suggested here shifts arbitrariness from one component of the grammar to another is to put the shoe on the wrong foot: it is the phrase structure analysis of these constructions which transfers all of the arbitrariness of the word-formation component over to the syntactic component of core grammar.

We have seen that the Double Object and Verb-Particle constructions pose certain problems for any theory of grammar which claims that there are no phrase structure rules other than those which can be stated in terms of the category-neutral primitives of X-bar theory. This forced us to develop an analysis which crucially invokes two word-formation rules that derive verbal complexes similar to those found in clitic constructions in other languages. In the following sections, we shall see that the word-formation account of these constructions not only solves the special problems that arise for a theory with a category-neutral base, but also leads to interesting solutions to a number of long-standing mysteries associated with them. In addition, the word-formation rules proposed above also provide the basis for some surprising explanations of phenomena in superficially unrelated domains.⁸ We begin with a more detailed discussion of the Double Object construction.

2. Possessive Object Constructions

2.1. Oehrle (1975) observes that there are a number of Double Object constructions similar in structure to the "dative" cases in (1a), but for which there is no well-formed counterpart to the indirect object structure in (1b). It seems that these examples break down into two closely

related semantic classes, the first involving inalienable possession, and the second involving prior possession or loss of possession. The two classes are exemplified in (13) and (14), respectively; cf. (15) and (16):

- (13). a. This problem is giving [John] [a headache]
 b. This book has given [me] [an idea]
 c. This escapade almost cost [them] [their lives]
- (14). a. You shouldn't begrudge [John] [his wealth]
 b. I don't envy [him] [his success]
 c. This shirt cost [my brother] [twenty dollars]
- (15). a. *This problem is giving a headache to John
 b. ?*This book has given an idea to me
 c. *This escapade almost cost their lives to them
- (16). a. *You shouldn't begrudge his wealth to John
 b. *I don't envy his success to him
 c. *This shirt cost twenty dollars to my brother

In each class of examples in (13) and (14), the indirect object is not a true recipient or "goal", as is the case in the standard dative constructions.⁹ In (13), the first "object" (i.e., the incorporated NP, in our terms) is the inalienable possessor of the direct object. In (14), the relationship between possessor and possessed is similar to that in (13), and can perhaps best be characterized as "possession involving close association". Clearly, at some more abstract level, these two notions form a natural semantic class.

On the basis of the contrast between (13,14) and the ungrammatical dative counterparts in (15,16), Oehrle argued against the classical transformational analysis of the Double Object construction, according to which it is derived from an underlying complement structure such as that in (12a). Instead, Oehrle suggested that the Double Object construction is based on a distinct subcategorization frame, so as to allow (13,14). To account for

the correlation between the two complement structures in (1a) and (1b), he proposed that when a single verb has both subcategorization frames, they can be related by means of a lexical redundancy rule of the type discussed by Jackendoff (1975). Oehrle also noticed some subtle semantic distinctions holding between the pairs of structures in (1), which followed from the distinct subcategorization frames in his analysis.¹⁰

Of course, rejecting a transformational derivation of the Double Object construction does not necessarily imply the need for a distinct strict subcategorization frame, as we have already seen. In terms of the word-formation account proposed in section 1, the ungrammaticality of (15,16) must follow from the fact that NP-Incorporation is obligatory for some reason. The fact that the structures in (13,14) adhere to a natural semantic class with respect to the thematic role of the indirect object suggests that the explanation for the ill-formedness of the corresponding dative structures in (15,16) may come from the means by which the θ -role is assigned to the incorporated NP. In all of the constructions in (13,14), the incorporated NP has the θ -role of Possessor, rather than that of Goal. In contrast, an NP appearing in the indirect object position in \bar{V} , as in (1b), is routinely assigned the Goal θ -role. But none of the verbs in (13,14) assign a θ -role of Goal; if this is the only kind of θ -role that can be assigned directly to the indirect object position, then we account immediately for the ungrammaticality of (15,16). (Note that (15a,b) are marginally acceptable on a literal reading, where the subject NP actually "gives" a headache or an idea to the indirect object goal.)

How, then, is the Possessor θ -role assigned to the Incorporated NP? Here we can adopt a version of Jaeggli's (1980) analysis of inalienable possession constructions in Spanish and French, which we will discuss in Section

2.3. Specifically, we can assume that the verbs in (13,14) assign the Possessor θ -role directly to the incorporated object position within the structure of the complex verb. Then it will follow that θ -role assignment is possible only if the verb contains an incorporated NP. (15) and (16) both involve a θ -criterion violation since the Possessor θ -role is not assigned and there is no Goal θ -role for the indirect object NP in the verb's θ -grid.

2.2 Actually, we can look at these facts slightly differently. It has often been noted that the Double Object construction is limited to verbs which involve possession in one form or another. This is perhaps most obvious in the Possessive constructions in (13,14), where there is no Goal θ -role involved. But it is also true in another sense with respect to the "dative" constructions in (1): these also involve transfer of possession, in that the argument which is assigned the θ -role of Goal also becomes the possessor of the direct object as a result of the action of giving or sending. Whereas the Goal θ -role is normally assigned to the indirect object position in \bar{V} , the Possessor θ -role is usually assigned to the incorporated NP position within the verbal complex. Recall that the incorporated NP in the Double Object construction is associated with the indirect object position by virtue of governing an empty NP, analogous to Borer's (1981) analysis of clitic constructions (cf. Jaeggli 1980). In a sense, then, we might say that the incorporated NP in (1a) is associated with two θ -roles simultaneously: Goal and Possessor.

This interpretation makes a rather straightforward prediction: when an argument is ineligible to receive a Possessor θ -role, it should not be able to appear as an incorporated NP. In fact this is correct, as has

often been noted in the literature. Compare:

- (17) a. Wayne sent a telegram to Robert
Kevin threw the ball to Bill
- b. Wayne sent a telegram to Canada
Kevin threw the ball to the ground
- (18) a. Wayne sent Robert a telegram
Kevin threw Bill the ball
- b. *Wayne sent Canada a telegram
*Kevin threw the ground the ball

In (18b), the incorporated NPs are not potential possessors of the direct object, at least on their normal interpretations in (17b). Suppose that we assume the following condition to govern verb-internal θ -role assignment:¹¹

- (19) If a verb assigns a θ -role to a direct object in \bar{V} , and if it also has an incorporated NP which is linked to another argument position in \bar{V} , then it assigns the θ -role of Possessor of the direct object to the incorporated NP.

Condition (19) is stated so as to rule out (18b) without simultaneously ruling out the non-possessive incorporated objects in Verb-Particle constructions such as (10).

In fact, there is an additional class of Double Object constructions which is closely parallel to the Dative constructions in (18a) in that the indirect object is also assigned two θ -roles. This is the so-called *for*-Dative construction, in which the indirect object is not assigned the θ -role of Goal, but rather functions as a Beneficiary:

- (20) a. Greg baked [a birthday cake] [for his mother]
Paul got [a new dress] [for Janice]
Joan bought [a tennis racket] [for Brian]
- b. Greg baked [his mother] [a birthday cake]
Paul got [Janice] [a new dress]
Joan bought [Brian] [a tennis racket]

In each of these sentences, the indirect object is the beneficiary of the

action, and also the possessor of the direct object as a result of the action. Although these might not appear to be distinct θ -roles, they can be distinguished by virtue of comparison with constructions in which the beneficiary is not a possessor of the direct object:

- (21) a. Eric washed his hair for his mother
b. John solved the problem for his colleague

In each of these constructions, the indirect object can be construed as a beneficiary of the action, but not as a possessor of the direct object as a result of the action. As expected, NP-Incorporation is incompatible with such constructions, presumably because of Condition (19):

- (22) a. *Eric washed his mother his hair
b. *John solved his colleague the problem

Thus we have a tripartite division among indirect object arguments: (i) those which are assigned the Possessor θ -role, and must appear in the incorporated NP position; (ii) those which are assigned the θ -role of Goal or Beneficiary, and must appear in the indirect object position in \bar{V} ; (iii) those which are assigned two θ -roles and may appear either as complements in \bar{V} or as incorporated NPs.

It might appear that the third class of arguments violate the θ -criterion, by virtue of being assigned two distinct θ -roles. In fact, however, the θ -roles are not really distinct, but rather seem to be intimately linked to each other. In the case of the Goal/Possessor indirect objects, the argument's status as Possessor of the direct object is dependent upon its being the Goal of the action; likewise, it is only by virtue of being the Beneficiary of the action in (19) that the indirect object can be construed as the Possessor of the direct object.

We will now formalize this insight, leading to a slight revision in the formulation of the θ -criterion. Suppose that each slot in the θ -grid of a verb can be associated with more than one θ -role, provided that the θ -roles do not conflict.¹² Thus for the verbs under consideration, the indirect object slot in the verb's θ -grid would have two θ -roles associated with it. We can think of this as a kind of merger of θ -roles.

By eliminating the biuniqueness of θ -roles and θ -grid slots, we can account for the apparent violations of the θ -criterion by making two assumptions. First, we can assume that the mapping from the θ -grid to syntactic structure involves the θ -roles themselves; thus a specific θ -role will be associated with a given A-position, exactly as before. However, we can reformulate the θ -criterion so that it applies not to θ -roles, but rather to slots in the θ -grid:¹³

- (23) a. Each slot in a θ -grid is associated with exactly one argument.
 b. Each argument is associated with exactly one slot in a θ -grid.

When a slot in a θ -grid is associated with just one θ -role, the empirical effect of (23a) will be identical to standard formulations of the θ -criterion, such as that in (16) in Chapter 3. Moreover, since two θ -roles can only be merged by virtue of appearing in the same position in a given θ -grid, (23b) will still prevent a single argument from being assigned a θ -role by more than one verb. The difference between the two formulations emerges only when a given slot in a θ -grid has two θ -roles associated with it, as with the indirect object slot of a Dative verb. These two θ -roles are intimately linked to each other semantically, as we have already observed. However, the two θ -roles are assigned differently: the Possessor θ -role is assigned to the incorporated NP position within the verbal complex,

while the Goal or Beneficiary θ -role is assigned to the A-position in \bar{V} . Since the indirect object argument can appear either in \bar{V} or as an incorporated NP, it has two distinct paths of association to the indirect object slot in the θ -grid: it can be associated with this slot by virtue of appearing in either position. Moreover, if the incorporated NP governs an empty A-position in \bar{V} , analogous to Borer's (1981) analysis of clitic constructions, then the incorporated NPs in the dative Double Object constructions will be associated with the indirect object slot in the θ -grid along both paths simultaneously.¹⁴ I will henceforth assume the formulation in (23), although a slight revision of this will be proposed in Chapter 7 (cf. fn. 13).

2.3. In languages which have special positions for clitic pronouns incorporated into the structure of the verb, there is a direct counterpart to the Possessive Double Object construction in English.¹⁵ Normally, cliticization of the indirect object is optional in Spanish:¹⁶

- (24) a. María envió una carta a Pedro
 María sent a letter to Pedro
 b. María le- envió una carta
 María him-sent a letter
 'María sent him a letter'
 c. María le- envió una carta a Pedro
 María him-sent a letter to Pedro
 'María sent a letter to Pedro'

Spanish allows "clitic doubling" of the indirect object, so it is possible for both the clitic and the lexical NP indirect object to occur, as in (24c).¹⁷ However, Jaeggli (1980) reports that when the indirect object is not assigned a θ -role of Goal, cliticization is obligatory, as in constructions involving inalienable possession of the indirect object:

- (25) a. Le- duele la cabeza a Juan
him-hurts the head to Juan
'Juan has a headache'
- b. Le- rompieron la muela del juicio a Juan
him-removed the wisdom tooth to Juan
'They took out Juan's wisdom tooth'
- (26) a. Le- duele la cabeza
'He has a headache'
- b. Le-rompieron la muela del juicio
'They took out his wisdom tooth'
- (27) a. *Duele la cabeza (a Juan)
'Juan has a headache'
- b. *Rompieron la muela del juicio (a Juan)
'They took out Juan's wisdom tooth'

Similarly, M. Montalbetti has informed me that the Spanish version of the English idiom in (13b) also requires an indirect object clitic:

- (28) a. Este libro le - ha dado una idea a Mario
this book him-has given an idea to Mario
'This book has given Mario an idea'
- b. Este libro le - ha dado una idea
'This book has given him an idea'
- c. *Este libro ha dado una idea a Mario

This striking cross-linguistic parallel is not limited to English and Spanish; analogous facts obtain with Possessor indirect object arguments in French:¹⁸

- (29) a. Marie a envoye une lettre à Paul
Marie has sent a letter to Paul
- b. Marie lui- a envoye une lettre
Marie him-has sent a letter
'Marie has sent him a letter'
- (30) a. Les livres lui-sont tombés des mains
the books her-have fallen from the hands
'The books have fallen from her hands'
- b. La tête lui- tournait
the head him- turned
'He felt dizzy'

- c. Je ne lui- envie pas son succès
 I not him-envy his success
 'I do not envy him his success' (cf. 14b)
- (31) a. *Les livres sont tombés des mains (à Marie)
 the books have fallen from the hands (to Marie)
 'The books have fallen from Marie's hands'
- b. *La tête tournait (à Jean)
 the head turned (to Jean)
 'Jean felt dizzy'
- c. *Je n'envie pas son succès (à Pierre)
 I don't envy his success (to Pierre)
 'I don't envy his success to Pierre' (cf. 16b)

French, like English, does not allow clitic doubling, so there are no French counterparts to the Spanish sentences in (24c) and (25). For this reason, there are no well-formed versions of (30) with a lexical NP instead of a clitic pronoun as the indirect object.

Jaeggli (1980) accounts for these facts by proposing that the Possessor θ -role is assigned to the clitic position within the verbal complex; he suggests that the θ -role is transmitted to the lexical NP in the doubling constructions by a special rule, thus satisfying the θ -criterion. If no clitic is present, then the Possessor θ -role cannot be assigned, thus violating (22b).

Recall that we have incorporated Jaeggli's proposal of θ -role assignment to the clitic position into our analysis of the analogous English Double Object construction. We differ, however, in assuming that this Possessor θ -role is also assigned in the regular dative constructions involving indirect object clitics. This allows us to account for the fact that cliticization of a Goal indirect object is only possible if the object is also associated with the possessor θ -role, by virtue of θ -role merger on a slot in the θ -grid. Thus condition (19) correctly rules out (32b), which is otherwise analogous to (24b,c):¹⁹

- (32) a. María envió una carta a Argentina
 María sent a letter to Argentina
 b. *María le- envió una carta (a Argentina) (cf. 18, 27b,c)

(32b) cannot be ruled out by stipulating that the indirect object clitic must refer to a person, since it can even refer to an inanimate thing, if the direct object is its inalienable "possession":

- (33) a. Le - rompieron la pata a la mesa
 it-they broke the leg to the table
 'They broke the leg of the table'
 b. Le - rompieron la pata
 'They broke its leg'

Note that the inability of the indirect object to cliticize in (32) does not imply that it is not a subcategorized argument. Rather, the ungrammaticality of (32b) follows from general principles; in particular, from the interaction of the θ -criterion with Condition (19).

2.4. We have seen that the distribution of indirect object arguments in English is far from arbitrary, but rather is governed by the same set of abstract principles which are also at work in the analogous clitic constructions in other languages. The fact that the distribution of the obligatory Double Object structures can be deduced from general principles suggests rather strongly that these constructions are not dependent upon special permutations of strict subcategorization frames stipulated in individual lexical entries.²⁰ (However, there are some further wrinkles in the operation of the NP-Incorporation rule, which we will discuss in Section 4.)

3. Syntactic Movement Rules

3.1. A Prediction

Our analysis of Double Object and Verb-Particle constructions makes

a straightforward prediction regarding the interaction of these constructions with syntactic movement rules. Specifically, it predicts that the incorporated NP position should never be subject to *Move*_α, while the true postverbal object position should be. Thus in (31), trace should never appear in the position NP_i, but should be able to appear in the position NP_j:

- (34) a. [_V [_V V - NP_i] - NP_j [e]_i]
 b. [_V [_V V - Prt] - NP_j]
 c. [_V [_V V - NP_i - Prt] [e]_i]

Unfortunately, it is impossible to test this hypothesis with respect to the distinction between (31b) and (31c), since the phonetic form of the string [V - Prt - trace] is indistinguishable from that of [V - trace - Prt]. The only possible test for this prediction would be based on Verb-Particle combinations which only appear in the configuration (34c). In fact, there are certain idiomatic combinations in which NP-Incorporation is obligatory, as noted by Oehrle (1975).²¹ In these cases, the predictions of the NP-Incorporation account appear to be confirmed:

- (35) a. The dog barked his head off.
 b. ?*The dog barked off his head.
- (36) a. *What did the dog bark - off?
 b. *His head, he barked - off.
- (37) *His head was barked off (by the dog)

Let us now consider the evidence with respect to the Double Object construction. Unlike the Verb-Particle construction, the Double Object construction always associates distinct θ -roles with the two positions, so it is easy to distinguish movement of NP_i from movement of NP_j. As it

turns out, however, the facts concerning movement with this construction are very complex, and have proved to be baffling in one way or another in most previous accounts. Actually, the movement facts are at first sight somewhat contradictory, with different types of movement yielding conflicting results. There are two basic cases to consider: movement to a non-A-position (including WH-movement and related rules) and movement to an A-position (basically, NP movement to subject position in passive constructions). We will consider the cases involving movement to a non-A-position first.

3.2. WH-Movement

3.2.1. Recall that there are three basic classes of Double Object constructions. In all three classes, the first "object" is an incorporated NP to which the θ -role of Possessor of the direct object is assigned, as required by (19). The classes diverge with respect to the assignment of a second θ -role to the indirect object argument: in Class I, the indirect object is also assigned the θ -role of Goal; in Class II, it is assigned the θ -role of Beneficiary, and in Class III, it is assigned no additional θ -role at all. The three classes are exemplified in (38):

- (38) I. Wayne [sent Robert] a telegram
 Debbie [gave Anne] a record
 II. Greg [baked his mother] a birthday cake
 Paul [got Janice] a new dress
 III. I don't [begrudge John] his wealth
 This shirt [cost Bill] ten dollars

Classes I and II alternate in constructions in which the indirect object argument appears in an A-position in \bar{V} ; this is possible because there are two "paths of association" between the argument and the indirect object slot in the verb's θ -grid. This is not available for Class III, since the

only θ -role "path" is that of Possessor of the direct object, which is always assigned to the incorporated position within the verbal complex:

- (39) a. Wayne sent a telegram to Robert
 Debby gave a record to Anne
 b. Greg baked a birthday cake for his mother
 Paul got a new dress for Janice
 c. *I don't begrudge his wealth to/for John
 *This shirt cost ten dollars to/for Bill

Since both the postverbal NPs in (39a,b) are constituents of \bar{V} , they are both subject to WH-movement, as we expect:

- (40) a. What did Wayne send — to Robert?
 b. What did Greg bake — for his mother?
 (41) a. Who did Wayne send a telegram to — ?
 b. Who did Greg bake a cake for — ?

Presumably verb and preposition are reanalyzed in (41); see Chapters 3 and 7 for some discussion of this point.

3.2.2. In the Double Object constructions in (38), the second NP is the true object of the verb in \bar{V} , and therefore is subject to WH-movement:

- (42) a. What did Wayne send Robert — ?
 Which record did Debbie give Anne — ?
 b. What did Greg bake his mother — ?
 What kind of dress did Paul get Janice — ?
 c. What did you begrudge John — ?
 What did this shirt cost Bill — ?

On the other hand, the first "object" in the Double Object construction is actually incorporated into the verbal complex, and so it should not be subject to movement. In general, this prediction is borne out:

- (43) a. ?*Who did Wayne send — a telegram?
 ?*Which girl did Debbie give — a record?

- b. *Whose mother did Greg bake — a birthday cake?
*Which girl did Paul get — a new dress?
- c. **Who don't you begrudge — his wealth?
**Which man did this shirt cost — ten dollars?

Nevertheless, there is a curious gradation of increasing ungrammaticality from (a) to (c) in (43). For most speakers, the grammaticality judgments of (43a) are somewhat delicate, and some even find these sentences acceptable. Some previous analyses have interpreted this as a dialect split. However, Weinberg and Hornstein (1981) point out that even speakers who accept (43a) find long extractions involving successive-cyclic movement to be much worse:

- (44) a. *Who did Carol say [that Wayne sent — a telegram] ?
b. *Which girl does John believe [that Debbie gave — the record] ?

Moreover, with other constructions involving movement to an embedded COMP position, the sentences corresponding to (43a) are fully ungrammatical. This is illustrated in the relative clause, tough-movement, and cleft constructions in (45a-c):

- (45) a. *Wayne is the guy that Robert sent a telegram
*I met the girl last week that Debbie gave a record
- b. *Robert wasn't very easy to send a telegram
*Anne is hard to give anything
- c. *It was Robert that Wayne sent a telegram
*Was it Anne that Debbie gave the record?

The same holds true for Focus NP Shift constructions, which involve adjunctions to \bar{V} , as noted in Chapter 3:

- (46) a. *Wayne sent — a telegram [the guy who we met last week]
b. *Debbie gave — a record [the girl whose bicycle is outside]

Thus it is reasonable to conclude that movement of the first NP to a non-

A-position is basically ungrammatical, as predicted by the NP-Incorporation theory. Why, then, are the sentences in (43a) acceptable for some speakers? Weinberg and Hornstein suggest that these sentences are very easy to process and that the processing mechanism manages to bypass the grammar in simple sentences. Alternatively, it may be that these sentences are accepted on direct analogy with their counterpart in (41a); in effect, speakers who accept (43a) may do so by "reading in" the presence of an invisible preposition *to*. If such analogical processing is possible only in simple sentences, then the ungrammaticality of (44-46) would follow. The "simple" sentence in (43c) involving obligatory NP-Incorporation would also be blocked, since there is no analogous structure involving a stranded preposition to serve as a basis for the analogy (cf. 39c). Finally, we might attribute the slight difference between (43a) and (43b) to the fact that the preposition *to* is easier to "read in" to a structure than the preposition *for* is. This difference is also reflected in the NP-movement possibilities, as we shall see shortly.

3.2.3. In general, then, it seems that the facts concerning movement to non-A-positions are exactly what the NP-Incorporation analysis of the Double Object construction predicts, apart from some minor complications involving analogical acceptability. It is perhaps worth noting that under traditional assumptions about the Double Object construction -- according to which both NPs are constituents of \bar{V} -- the inapplicability of movement is utterly mysterious. Weinberg and Hornstein (1981) suggest that the ungrammaticality is due to a surface filter which disallows oblique Case on an empty category. (They assume that the first object in this construction is assigned oblique Case.) Apart from the fact that their account is based on a traditional analysis of Double Object constructions which is un-

able to account for the phenomena discussed in other sections of this chapter, there is one basic problem with the oblique-trace filter account of (43-46): it does not generalize to the NP-movement constructions, where no Case is assigned to the trace. Although traditional accounts of the NP-movement facts would consider this to be an advantage, we shall see momentarily that it is quite the opposite.

Many recent discussions of the WH-movement facts have recognized that there is no natural way to rule out (43-46) under the assumption that the first "object" is a constituent of VP. For this reason, a number of investigators have suggested that the sentences are really grammatical, but just difficult to process. The first proposal along these lines is that of Jackendoff and Culicover (1971), who suggest that the parsing device has a tendency to "overlook" the gap before the direct object. Since their paper appeared, there have been a number of counterproposals in the parsing literature on how the parser might be designed so as to fail to process these WH-extraction cases.²² I do not intend to discuss these proposals in detail here, but a few brief remarks are perhaps in order.

First of all, it seems that any processing account of the extraction facts ought to predict the comparative judgments concerning (43a,b) and (43c) to be precisely the opposite of what they actually are. Most of the processing accounts -- with the exception of Fodor's (1978) analysis -- have tried to exploit the fact that the Double Object constructions have grammatical variants where the indirect object follows the direct object. Thus the parser gets "tricked" by the extraction structure, and overlooks the indirect object trace, assuming that the direct object immediately follows the verb. By the time the processor discovers that there is no

stranded preposition after the direct object, it is too late to go back and try out the Double-Object structure. Quite apart from the fact that there is no obvious reason why the processor should give priority to one structure over another, this type of account ought to predict that (43c) should be more or less acceptable, since these verbs have no corresponding structures which could "confuse" the processor. In fact, however, it seems that the existence of the alternative structure actually helps the processor, by providing a basis for analogy, as observed above.

A second objection to the processing accounts is that they are all forced to attribute a vast amount of power to the parser, so that even after speakers clearly understand the intended structure of (43-46) they still judge these sentences to be unacceptable. This is quite unlike the "garden-path" sentences discussed by Marcus (1980), which are normally judged acceptable after a second or third reading. If anything, the general pattern of reactions is precisely the opposite of what a parsing account might reasonably be expected to predict: it is common for speakers to accept sentences such as (43a) on first hearing them, only to reject them after subsequent reflection or comparison with (41a). Again, this suggests that the processor can get "tricked" into thinking that an ungrammatical sentence is grammatical, rather than vice-versa.

A third objection is that most of the processing accounts of (43-46) do not generalize in obvious ways to cover other structures besides those involving Double Object constructions, and it is not misrepresentative to say that the recent literature has been more successful in showing that previous processing accounts of these facts are untenable than it has in developing workable parsing accounts that have a significant base of in-

dependent motivation. For some discussion of the relevant literature, see Fodor (1978) and Weinberg and Hornstein (1981).

On the other hand, under the NP-Incorporation account of these constructions, the parsing accounts are superfluous, since the ill-formed extractions are ruled out by the most basic principle of syntactic movement -- that it is unable to analyze a subpart of a word.

3.3. NP-Movement

3.3.1. The facts concerning NP-movement to an A-position at first sight appear to yield contradictory results. Because of the effects of the Binding theory, the only possible cases of movement to an A-position involve movement to subject position in passive constructions. Contrary to our expectations, most dialects do not allow the second NP in (35-37) to appear as subject of a passive dative construction:

- (47) a. %*A telegram was sent Robert (by Wayne)
 %*A record was given Anne (by Debbie)
 b. *A birthday cake was baked his mother (by Greg)
 * A new dress was got Janice (by Paul)
 c. *His wealth was not begrudged him
 *Ten dollars were cost Bill

This is surprising, since the second NP is the true object, and it therefore ought to be subject to NP-movement, just as it is subject to WH-movement.

With respect to the movement possibilities for the first NP, things are somewhat more complex. All speakers accept passive versions of the Class I verbs in (38), with the indirect object in subject position:

- (48) a. Robert was sent a telegram (by Wayne)
 b. Anne was given a record (by Debbie)

Some speakers accept passive versions of Class II verbs, but most American

speakers reject them; cf. Fillmore (1965):

- (49) a. %*His mother was baked a birthday cake (by Greg)
 b. %*Janice was got a new dress (by Paul)

Finally, all speakers reject passive versions of (38III):

- (50) a. *John isn't begrudged his wealth (by me)
 b. *Bill wasn't cost ten dollars (by this shirt)

According to the NP-Incorporation analysis, movement from the first NP position should always be ruled out; thus (48) appears to be counter-exemplary, as does (49) for those dialects which allow it. On the other hand, (50) is just what the analysis predicts.

The contrast between (48) and (47a) has been taken to be a fundamental property of the Double Object construction by most previous analyses, which have usually been designed to account for it. Fillmore's (1965) analysis ordered the *to*-Dative rule prior to the Passive transformation, so as to "feed" Passive with respect to the indirect object in (48), while "bleeding" it with respect to the direct object in (47a). (Fillmore's analysis assumed that only the NP adjacent to the verb could be passivized.) Some subsequent accounts that make crucial reference to grammatical relations have attempted to derive the same result, by "promoting" the indirect object to the status of a direct object, while simultaneously depriving the direct object of its grammatical "object" status.²³ (These accounts assume that only the derived grammatical object can passivize.)

These analyses account for the contrast between (48) and (47) in the majority dialect, but the other facts require some unusual stipulations. First, there is no natural way to rule out (50). Second, the ungrammaticality of (49) requires either a global rule condition or extrinsic rule ordering,

unless the Passive rule were explicitly formulated so as not to apply to a Beneficiary direct object -- in those dialects where it is ungrammatical. Moreover, the dialectal status of the judgments in (47a) is itself problematic for any account which claims that the direct object is deprived of its object status as an automatic consequence of the "promotion" of the indirect object. In fact Oehrle (1975) observes that many of the speakers who reject (47a) will accept (51), where the indirect object is an unstressed pronoun:

- (51) a. %No explanation was given them
 b. %The job was offered him

As Oehrle remarks, it is natural to account for the preferred status of (51) in terms of a cliticization rule, but it is difficult to see how this would help an analysis which makes crucial reference to grammatical relations in accounting for the contrast between (47a) and (48).

3.3.2. Let us now see how the NP-Incorporation analysis of the Double Object construction might account for these facts. Consider first (48). If the first NP in the Double Object construction is really part of the verb, then it should not be susceptible to movement of any sort, so the grammaticality of (48) seems like straightforward counterevidence to the NP-Incorporation story. But this is only true if the sentences in (48) are truly derived from the Double Object construction. Suppose instead that (48) is a passive version of (39a), where the indirect object appears after the direct object in VP. Normally the indirect objects in this construction are preceded by the preposition *to*, and the absence of *to* is usually taken as a diagnostic for the Double Object constructions. But if we interpret *to* as a dummy Case marker, analogous to French *à*, then it follows that it

will only appear where it is required for Case assignment.

When no movement applies, as in (39a), the indirect object NP must be assigned Case in order to make θ -role assignment possible; therefore *to* is required. This is also true in the case of movement to a non-A-position (e.g., WH-movement), since the trace functions as a variable to which Case must be assigned. But in the passive construction in (48), the trace in the indirect object position is part of an A-chain which is headed by the NP in subject position. Since nominative Case is assigned to the subject NP in (48), the indirect object position is A-associated with the nominative Case feature, and θ -role assignment is possible.

This situation is exactly analogous with the instances of NP-internal movement discussed in Chapter 3:

- (52) a. [the destruction of the city]
 b. [[the city's]_i destruction [e]_i]
 c. *[[the city's]_i destruction of-[e]_i]
 cf. d. *[[John]_i was given a book to-[e]_i]

The dummy Case marker *of* corresponds to the preposition *to* in the indirect object construction, while the nominative Case assigned to subject position in (48) corresponds to the genitive Case in (52b,c). Moreover, the status of (52c) is exactly analogous to that of (52d), as we should expect.²⁴

This reinterpretation of the passivized indirect object constructions in (48) disposes of them as potential counterexamples to the NP-Incorporation analysis of the Double Object construction. Moreover, this account leads to a natural explanation for the ungrammaticality of the sentences in (50). Since the indirect objects in (50) are only assigned the Possessor θ -role, NP-Incorporation is effectively obligatory in these constructions (cf. 39c). Therefore the sentences in (50) have no alternative source structure

of the kind that is available to (48); they must be derived from the Double Object construction. But *Move α* may not apply to a subpart of a word, and so they are ungrammatical.

Consider now the dialectal variation with respect to passivized *for*-Datives in (49). The relevant parameter concerns the status of the preposition *for*. If *for* is taken to be a dummy Case marker, then NP-movement to subject position will be possible, parallel to (48); this is what happens in the dialects where these sentences are accepted. On the other hand, if *for* is taken to be a true preposition, then it will have to be lexically inserted at D-structure, by virtue of the Projection Principle.²⁵ Therefore in dialects where *for* is understood to be a true preposition, there is no possible source structure for (49) other than the Double Object construction, and these cases will be exactly parallel to those in (50). In a sense, the preposition *for* straddles the boundary between dummy prepositions and true prepositions with semantic content: although its meaning is predictable when it assigns Case to a subcategorized argument, it can also be used with virtually the same meaning in non-subcategorized contexts. It is therefore natural to expect speakers to vary on how they interpret its status. Since any theory of grammar must assume that the child is forced at some point to decide on the status of prepositions such as *for*, the dialectal variation in (49) comes at no cost to the NP-Incorporation theory.

3.3.3. Let us now turn our attention to the NP-movement possibilities with respect to the second NP position in the Double Object construction. Previous analyses have accounted for the ungrammaticality of (47) in most dialects by assuming that the second NP is not subject to NP movement for one reason or another. But if this is the true object of the complex verb,

as the NP-Incorporation analysis claims, then we should expect NP-movement to be possible, especially since WH-movement is allowed, as in (42). Recall, however, that the passive construction involves two distinct processes. One of these is syntactic: the application of *Move α* , taking the NP from object position to subject position. The other part is morphological: the derivation of the passive participle from the verbal stem. In the case of the Double Object construction, this morphological change would have to interact with a rule of word-formation, namely NP-Incorporation.

This observation suggests a very natural account of the ungrammaticality of (47): the rule of NP-Incorporation only applies to verbal stems, and does not extend to passive participles. The status of all word-formation rules is to some extent arbitrary, however, so it is not entirely surprising that some dialects allow a marginal extension of NP-Incorporation so as to apply to the participial stems in (47a).²⁶ In other words, it is not necessary to assume that any of the dialects differ with respect to the object status of the second NP; nor is it necessary to assume that the dialects differ in terms of arbitrary conditions on the Passive transformation - this is simply a subcase of *Move α* . Instead, the dialectal variation is accounted for in precisely the way that we should expect: in terms of the domain of application of a language-particular rule of word-formation.

This also allows us to capture the dialectal variation with respect to the unstressed pronominal indirect objects in (51). Quite simply, we can assume that the dialects which accept (51) (but not 47a) contain a word-formation rule which adjoins a pronominal clitic position to passive participles. We might think of this rule as a less marked variant of the NP-Incorporation rule which appears in the dialects which accept (47a).

In fact, there is independent evidence for dialectal indirect object

clitics of this type. For most speakers of American English, (53) are ungrammatical, as opposed to the fully acceptable (54):

- (53) a. *I gave John it
- b. *I turned off it
- (54) a. I gave it to John
- b. I turned it off

It has been suggested in the literature that the ungrammaticality of (53) could be naturally accounted for if we assumed that English obligatorily cliticizes unstressed pronominal objects to a governing verb or preposition. The clitics in (54) appear in postverbal position, so the effect of cliticization is string-vacuous, since the direct object must also be adjacent to the verb, by virtue of the adjacency condition on Case assignment.²⁷ In terms of our analysis of the Verb-Particle and Double Object constructions, the ungrammaticality of (53) implies that the direct object pronominal clitic position is adjacent to the verbal stem, to the left of the incorporated NP and Particle positions. Significantly, however, speakers who accept (51) will also accept (56):

- (56) a. %I gave him it
- b. %I sent her them yesterday

This suggests that these speakers have a distinct word-formation rule creating an indirect object clitic position to the left of the direct object clitic. Presumably it is this rule which has generalized so as to apply to passive participial stems in the dialects which accept (51). There are further dialectal variations on these clitics which we need not pursue further here.

Thus it turns out that most of the mysteries associated with the

application of NP movement to the Double Object construction find reasonably natural explanations in terms of the NP-Incorporation analysis. Phenomena which appear at first glance to call for ad hoc lexically-governed conditions on syntactic movement rules can be attributed either to the status of the preposition *for* or else to dialectal variations in the rules of word formation which incorporate clitic and NP positions within the structure of the verb. Despite frequent claims to the contrary, the evidence from NP movement also suggests that the second NP is the only true grammatical object of the verb in the "Double Object" construction.

4. A Stem-class Distinction

4.1. Another mysterious property of the Double Object constructions is that it is limited to verbs which belong to the morphological Native (Germanic) stem class, as observed by Green (1974), and discussed by Oehrle (1975) and Emonds (1981). In fact, there are a number of near-synonymous "minimal pairs" of verbs consisting of a Native stem-class verb and a Latinate stem-class verb, where only the former allows the Double Object construction:

- (57) a. John told [Bill] [a possible solution]
 b. Eric taught [Robert] [swordsmanship]
 c. Brian showed [his mother] [his new invention]
- (58) a. *John suggested [Bill] [a possible solution]
 b. *Eric explained [Robert] [swordsmanship]
 c. *Brian demonstrated [his mother] [his new invention]
- (59) a. John suggested a possible solution to Bill
 b. Eric explained swordsmanship to Robert
 c. Brian demonstrated his new invention to his mother

The grammaticality of the examples in (59) with a Goal indirect object shows that the subcategorization frames of the verbs in (58) should allow

for the structures in (24), abstracting away from the stem-class distinction.

The precise definition of the morphological Native stem class seems to be phonologically determined. In general, the Native stems are all either monosyllabic or else disyllabic with first-syllable stress. The verbs in (58,59) fail to meet these criteria, either by virtue of having final stress (*suggest* and *explain*) or by virtue of being trisyllabic (*demonstrate*). In general, the morphological class distinctions correlate with etymological fact. In some cases, however, verbs switch classes. Thus Green (1974) observes that *promise*, which is historically Latinate, has apparently shifted to the Native stem class, as indicated by the first-syllable stress; cf. *advise*, which maintains final stress. As a corollary of this, *promise* can appear in the Double Object construction:

- (60) a. I promised [a new bicycle] [to my son]
 b. I promised [my son] [a new bicycle]

A similar stem-class shift seems to be in progress with *donate*. For many speakers, *give* and *donate* form a minimal pair comparable to those in (57-59):

- (61) a. I gave [ten dollars] [to the society]
 b. I donated [ten dollars] [to the society]
 c. I gave [the society] [ten dollars]
 d. %*I donated [the society] [ten dollars]

For some speakers, however, (61d) is grammatical, and this appears to correlate with the fact that *donate* is also shifting from final-syllable stress to the Native pattern of first syllable-stress.²⁹

4.2. The Verb-Particle construction is also limited to verbs that belong to the Native stem class, as observed by Fraser (1965). Many of the Verb-Particle combinations have an idiomatic reading that one might plausibly expect to be limited to a single verb, regardless of stem class. But in

some cases, the particle has a directional or completive sense that is quite predictable, and these we might reasonably expect to generalize to synonymous verbs, abstracting away from stem class distinctions. With such cases, it is possible to construct minimal pairs exactly parallel to those in (57-59):

- (62) a. John gave away his money to charity
- b. Jim turned around the picture so that we could see it
- c. Brian threw down the pizza in disgust
- d. Eric fixed up his car
- (63) a. *John donated away his money to charity
- b. *Jim rotated around the picture so that we could see it
- c. *Brian propelled down the pizza in disgust
- d. *Eric repaired up his car

It is quite clear that the only problem with (63) is the particle intervening between the verb and its object. In fact, in some cases the same particle can appear elsewhere in \bar{V} if it is part of a complex PP complement:

- (64) a. John donated all of his money [away to charity]
- b. Brian propelled the pizza [down to the bottom of the elevator shaft]

Thus it is beyond dispute that the Verb-Particle construction, like the Double Object construction, is limited to the verbs belonging to the morphologically-defined class of Native stems.

4.3. It should hardly be surprising that both of these constructions are limited to a particular morphological stem class if both of them are crucially dependent upon the application of a word-formation rule. As Aronoff (1976, 51) observes, "it has long been recognized that the vocabulary of English is divided, for the purposes of morphology (and to some extent phonology) into two distinct parts, *native* and *latinate*, and that there are many

rules which are sensitive to this distinction." Arenoff goes on to point out that although many word-formation rules apply exclusively to Latinate stems, there are very few rules applying exclusively to Native stems, although he cites *-hood* suffixation as an example. In terms of our analyses of the Double Object and Verb-Particle constructions, however, it is clear that two other word-formation rules should be added to this list: *NP-Incorporation* and *Particle-Incorporation*. Viewed in these terms, it is no more surprising that these constructions are limited to a particular stem class than it is for derived nominals ending in *-al* and *-ity* to be limited to Latinate stems. This is just the kind of arbitrary language-particular idiosyncrasy that is typical of word-formation rules, as we have already noted. In this respect, the English NP-Incorporation rule differs significantly from the morphological rules deriving clitic complexes in Romance, which are not limited to a particular morphological stem-class. But in terms of the interaction of the derived verbal complex with the abstract syntactic principles governing the assignment of Case and θ -roles to subcategorized arguments, the English incorporated NPs behave just like their Romance clitic counterparts.

It hardly needs pointing out that the limitation of the Double Object and Verb-Particle constructions to the Native stem class is utterly mysterious under the assumption that no special word-formation rule is involved. In terms of the classical transformational analysis, it is necessary to place a special condition on the transformational rule permuting the indirect object NP in the Double Object construction, so as to prevent it from applying within the domain of a Latinate verb.³⁰ Within an analysis that accounts for the possibility of Verb-Particle constructions or Double Object constructions in terms of permutations of grammatical relations or

strict subcategorization frames, it would be necessary to stipulate that the permutation rules are limited to verb stems of a particular phonological shape. Regardless of whether this correlation is stated in terms of syntactic or lexical rules, it weakens the theory of grammar to allow for rules manipulating syntactic argument structures to make crucial reference to terms of the phonological component. The NP-Incorporation analysis avoids this trap by dissociating the word-formation rule creating the incorporated NP position from the syntactic rules which make reference to its output. In fact, we have seen that the same incorporation rule is involved in both Double Object and Verb-Particle constructions, despite the fact that the subcategorization frames of these verbs associate this position with different arguments positions in \bar{V} : the Double Object verbs associate the incorporated NP with the indirect object position, while the verbs occurring in the Verb-Particle construction normally take only a single direct object NP, and associate the incorporated position with that. The word-formation rule itself is subject to numerous arbitrary conditions, such as the limitation to the Native stem class, as well as the limitation to active verb stems which we discussed in connection with NP-movement. But the rules of θ -role assignment and strict subcategorization are entirely oblivious to these restrictions; they are subject only to the general principle governing clitic constructions in Universal Grammar.

5. Interactions of the Verb-Particle and Double Object Constructions

5.1. The rules of NP-Incorporation and Particle-Incorporation both apply to the same class of verbs in the Verb-Particle constructions, where the verb subcategorizes for just a single object, so it should not be surprising to find them both applying to verbs which also take indirect objects.

In fact, this is correct, as was first noted by Emonds (1972):

- (65) a. George has [paid back] [most of the money] [to the bank]
 b. The clerk [typed out] [a permit] [for John]
 c. The board [sent out] [an announcement] [to the stockholders]
- (66) a. George has [paid the bank back] [most of the money]
 b. The clerk [typed John out] [a permit]
 c. The board [sent the stockholders out] [an announcement]

Recall that the "dative" verbs routinely associate the incorporated NP position with the indirect object A-position, by virtue of θ -role merger in a slot on the thematic grid. This holds true in (66) as well, suggesting that the incorporation of the particle has no effect on the rest of the thematic structure of the verb:

- (67) a. [_V V - NP_i] NP [e]_i
 [send -the stockholders_i] [an announcement] [e]_i
- b. [_V V - NP_i - Prt] NP [e]_i
 [send -the stockholders_i-out] [an announcement] [e]_i

In other words, there is no reason for the incorporated NP position to be associated with the direct object position, just because Particle Incorporation has applied.

5.2. On the other hand, consider the sentences in (68):

- (68) a. George has paid most of the money back to the bank
 b. The clerk typed a permit out for John
 c. The board sent an announcement out to the stockholders

Most analyses of the interaction of the Verb-Particle and Double Object constructions have assumed that (68) is more or less parallel in structure to (66). In terms of the classical transformational analysis, Particle

Movement can apply either to the output of the Dative transformation, yielding (66), or to the base structure in (65), yielding (68). Translated into our analysis, which claims that there is no rule of "particle movement", this would imply that the incorporated NP in (68) is linked to the direct object position, rather than to the indirect object position:

- (69) $[_V \text{ v} \quad - \quad \text{NP}_i \quad - \quad \text{Prt} \quad] \text{ [e]}_i \text{ to NP}$
 $[\text{ paid} \quad - \quad \text{the money}_i \quad - \quad \text{back} \quad] \text{ [e]}_i \text{ [to the bank]}$

Notice that the claim implicit in (69) is that the incorporated NP position in dative verbs may correspond either to the indirect object or to the direct object. (Alternatively, it might imply that there are two incorporated positions -- one for each object -- as is true for French clitic constructions.)

This does not pose a serious problem on a theoretical level, but it does raise serious questions about acquisition. It is safe to assume that every instance of a Double Object construction provides explicit evidence for an incorporated indirect object position, but the effects of direct object incorporation would be string-vacuous for any construction where no particle is involved:

- (70) a. [give] [the book] [to John]
 b. [give - the book_i] [e]_i [to John]

The particular arrangement of objects and particles in (68) is sufficiently uncommon that we would not normally expect it to have such a fundamental effect on the word-formation rules and/or strict subcategorization frames for the entire class of Double Object verbs. For this reason, the parallel between (66) and (68) is surprising in a way that it was not for the classical transformational account.

It is therefore significant that there is some evidence suggesting that the parallel cited above is actually false. Specifically, it seems that the particle in (68) is neither a separate constituent of \bar{V} , as previous analyses have assumed, nor within the structure of the verb, as suggested in (69). Rather, it appears that the particle is actually adjoined to the *to*-phrase, forming a complex PP. (I assume, following Emonds', 1972 suggestion, that particles are actually intransitive prepositions.) Then the actual structure of (68) would be (71):

- (71) V - NP - [_{PP}Prt-to-NP]
 [paid] [the money] [back-to the bank]

There are two pieces of evidence favoring (71) over (69), apart from the considerations noted above. First, WH-movement can apply to the entire complex PP:

- (72) Back to whom did George pay the money — ?
 Out to the stockholders, the board sent an announcement —

Second, as Oehrle (1975) observed, interpolation of manner adverbials between the particle and the following *to*-phrase is very odd:

- (73) ??George paid the money back quickly to the bank
 ??The board sent an announcement out secretly to the members

(It is important to disregard the irrelevant right-dislocation reading for (73), where there is an intonational break between the particle and the following *to*-phrase.) Note that manner adverbials can appear before the particle, which ought to be completely impossible if the particle were within the structure of the verb.

- (74) a. ?George paid the money very quickly back to the bank
 ?The board sent an announcement secretly out to the members
 cf. b. *Kevin turned the light quickly off
 *Janice cut the cabbage carelessly up

It is worth pointing out that if (71) is the correct structure for the \bar{V} in (68), then the acquisition problem evaporates, because there is considerable independent evidence for the complex PP structure, as has often been observed:

- (75) The cat is sleeping [out in the back yard]
 John threw the ball [up into the air]
 Brian is [down in the dumps] today
 Up out of the hold jumped the rabbit

Under the classical analyses of the interaction between the Verb-Particle and Double Object constructions, these facts are all rather curious, but they are just what we expect in the NP-Incorporation account.

5.3. The situation with *for*-Datives is slightly different. Here, there is a much looser connection between the Beneficiary PP and the argument structure of the verb. In these cases, the particle following the object is not adjoined to the *for*-phrase, suggesting that it is actually part of the verb:

- (76) a. Janice baked a cake up for Paul
 Kevin turned the music down for Adrienne
 Scott picked a picture out for Greg
 b. *Up for whom did Janice bake a cake — ?
 *Down for Adrienne, Kevin turned the music —
 *Greg is the guy out for whom Scott picked a picture —

In our terms, this means that the particle must be part of the verb; this in turn implies that the verbs in (76) have an incorporated NP linked to the object position. Does this pose a problem for our account? No -- because in precisely these cases, where the incorporated NP can be linked to the direct object position, it is impossible to have an incorporated indirect object:

- (77) *Janice [baked — Paul — up] a cake

*Kevin turned Adrienne down the music
 ?*Scott picked Greg out a picture

Although there is some variation with respect to the status of the *for*-phrase, from verb to verb and from speaker to speaker, it seems that in general, things work out more or less as we predict.

5.4. Another curiosity piece associated with (66) is that some dialects (including my own) allow a further variant, in addition to (68):

- (78) a. %George has paid back the bank most of the money
- b. %The clerk typed out John a permit
- c. %The board sent out the stockholders an announcement

In Emonds' (1972) analysis, where this was first observed, the dialect which allows (78) was assumed to have two distinct dative-movement rules. In our terms, (78) simply shows that some dialects allow the NP-Incorporation rule to apply to the output of the Particle-Incorporation rule. This is precisely the type of dialectal variation that should be expected, since it is well-known that the order of clitics varies from one dialect to another in the Romance languages. By capturing both the arbitrary arrangement of clitics and the arbitrary arrangement of incorporated NPs and particles in terms of word-formation rules, it is possible to limit extrinsic rule ordering to the morphological component of the lexicon, where it belongs.

5.5. There is one last phenomenon associated with the interaction of the Verb-Particle construction with the Double Object construction which is of some interest in that it provides support for the analysis of passivized indirect objects developed in Section 4. Recall that the second NP in the Double Object construction is normally subject to WH-movement -- as we expect given its status as the true object of the verb. Surprisingly, however,

this is not possible in (66) or (78):

- (79) a. *Which money did you pay back the bank — ?
 *Which money did you pay the bank back — ?
 b. *This is the announcement which the board sent out the members —
 *This is the announcement which the board sent the members out —

I know of no straightforward explanation for this; by all expectations, the trace of the NP object in (79) ought to be assigned Case and properly governed by the verb, thus satisfying the θ -criterion and the ECP. Perhaps some refinement of the complex-verb analysis might provide an answer, although it is far from obvious what kind of an adjustment would be required. Suppose that we simply stipulate that in the configuration (80), the verb is unable to properly govern the direct object position NP_j , for whatever reason:

- (80) a. $[\bar{V} \ [V \ V - NP_i - \text{Prt}] - NP_j - [e]_i]$
 b. $[\bar{V} \ [V \ V - \text{Prt} - NP_i] - NP_j - [e]_i]$

But now consider the paradigm in (81) and (82):

- (81) a. The bank was paid back the money
 b. The members were sent out an announcement
 (82) a. Which money was the bank paid back — ?
 b. This is the announcement which the members were sent out —

In (81), the indirect object appears as the subject of a passive verb. According to traditional analyses, the sentences in (81) are passivized versions of the Double Object constructions in (66,78); according to the NP-Incorporation account, they are derived from the corresponding structures in (65), where the dummy Case-marker *to* is inserted in the active form. Now if the structures in (81) were really derived from Double Object constructions, then (82) ought to be ruled out on the same grounds that (79)

is. In fact, we might even expect the added complexity of the passive construction in (81-82) to make these sentences even worse than their active counterparts. But of course the opposite is true. On the other hand, the NP Incorporation analysis of passivized indirect objects predicts exactly this result. This analysis claims that the true source structure of (81) is (83), where the rule of NP-Incorporation has not applied:

(83) $[\bar{V} \ [\ V - \text{Prt} \] \ NP_j \ \text{to-}NP_i \]$

The structure of (81) then corresponds to (84), while (82) corresponds to (85):

(84) $NP_i \ [_{VP} \ [_{\bar{V}} \ V - \text{Prt} \] \ NP_j \ [e]_i \]$

(85) $[\bar{S} \ WH_j \ [_{\bar{S}} \ NP_i \ [_{VP} \ [_{\bar{V}} \ V - \text{Prt} \] \ [e]_j \ [e]_i \] \]$

Since NP-Incorporation has not applied at any point in (85), the structure is not equivalent to (80), and the condition blocking proper government of the direct object trace is simply inapplicable. The crucial point to observe here is that regardless of the ultimate explanation of (79) -- which I have simply stipulated in the form of a condition blocking proper government of NP_j in (80) -- it is only under the analysis of passivized indirect objects developed in Section 4 that there is a natural explanation for the grammaticality of (82).

6. Some Related Constructions

I have suggested that the grammar of English has a word-formation rule of NP-Incorporation deriving verbal complexes with the structure in (86), among others:

(86) $[_V \ [_V \ +\text{NATIVE} \] - NP$

We have seen that the output of this word-formation rule interacts with two classes of strict subcategorization frames, involving (i) a single direct object NP, and (ii) two NPs, including a direct object and an indirect object. We shall now see that this rule also interacts with subcategorization frames that include \bar{S} complements, yielding some unexpected solutions to certain problems in superficially unrelated domains.

6.1. Subject-Control Complements

6.1.1. The first of these constructions involves structures of Subject Control, which we discussed in some detail in Chapter 3. In recent work, Williams (1980) has argued that there are two distinct classes of Control structures: those requiring c-command of the control clause by the antecedent controller, and those in which the antecedent does not c-command the complement, but rather appears within a subcategorized PP in VP. Williams refers to the first class of control structures -- those requiring c-command -- as structures of Obligatory Control, while the second class of cases are structures of Non-obligatory Control. He observes that a number of other properties correlate with the c-command restriction; in particular, he notes that the antecedent of an Obligatory Control structure is uniquely determined, while this is not necessarily true for the Non-obligatory Control structures.

Rosenbaum (1970) proposed a general condition on Control structures, called the Principle of Minimal Distance (PMD). According to this principle, the controlling NP for a control complement must be the "nearest" NP to the control clause. Williams' claim that the antecedent is not uniquely determined in Non-obligatory Control complements suggests that Rosenbaum's PMD does not apply to these structures. In fact, Manzini (1980) has argued that a number of control structures in Italian routinely violate Rosenbaum's

principle; these involve potential PP controllers in VP which are bypassed by the control rule so as to allow for subject control in a number of cases. She shows that the determination of the antecedent of PRO is largely determined by pragmatic criteria, and is sensitive to the meaning of the verb and the propositional content of the control clause itself. Since the potential controller in PP in these sentences does not c-command the control complement clause, these examples correspond to Williams' Non-obligatory Control structures.

Suppose that these conclusions are correct. This suggests that the Principle of Minimal Distance is only operative in structures of obligatory control in which there are two potential c-commanding antecedents. Effectively, this will derive the theorem in (87):

- (87) If an Obligatory Control verb subcategorizes for an NP object which c-commands the control complement, then the object NP must be the antecedent of PRO.

Thus if an obligatory subject control verb takes an indirect object argument in addition to the control clause, the indirect object will have to appear within a PP.

6.1.2. The statement in (87) holds true quite generally. There are two exceptions, however: *promise* and *ask*. Consider:

- (88) a. [John]_i promised [Bill]_j [_S PRO_i to wash the dishes]
 b. [John]_i asked [Bill]_j [_S PRO_i to be allowed to leave]

One might surmise, on the basis of (88), that (87) simply represents the unmarked option, and that the theory of grammar should not completely rule out the possibility of subject control overriding the PMD for particular verbs.

But there is some very strong evidence that (87) represents far more

than simply the unmarked option. Most theories of markedness assume that if the theory of grammar allows for two or more values for a specific parameter, the "unmarked" option is the value that is assumed to hold in the absence of any overt evidence to the contrary, while the "marked" options will be chosen only on the basis of positive evidence, or on the basis of other parameters related to it through the deductive structure of the grammar. Markedness theory thus provides an essential core of acquisition theory, in explaining how linguistic knowledge can arise on the basis of an impoverished stimulus. Nevertheless, the theory of markedness does not claim that the marked options are impossible to learn: it simply requires overt evidence for them to develop. Therefore, if (87) simply represents the unmarked option for determining the control properties of a given verb, we would expect that there would be a number of verbs which do not adhere to it (i.e., which choose the marked option). With verbs like *promise* and *ask*, it is easy to imagine the kind of positive evidence that could trigger the marked option of subject control. These verbs surely occur frequently in the primary linguistic data, with clear evidence that subject-control is involved:

- (89) a. I want you to promise me to behave yourself
 b. Go and promise your sister to be nice to her
 c. Did you ask me to be allowed to go outside?

In the light of these considerations, the results of Carol Chomsky (1969) are quite remarkable: she discovered that a large number of children continue to assume that *promise* and *ask* are object-control verbs very late in the period of acquisition, even after they clearly understand the basic meaning of the verbs *ask* and *promise* in non-control constructions.³¹ This suggests that if the violations of the PMD in (88) are a marked option allowed by

Universal Grammar, they are a very marked option indeed: in many cases, several years of overt evidence is not sufficient to inform the child of their correct status in the adult grammar.

Suppose that the PMD is actually an inviolable principle of grammar, and that verbs taking true NP objects will always grant Object Control priority over Subject Control. This would explain the tenacity of the object control properties of *promise* and *ask* in the immature grammars studied by Carol Chomsky, but they would appear to be completely inconsistent with the form of the mature grammar where subject control exists. We are thus left in a paradoxical position: depending upon the status of the PMD, we can either explain the stages of development when *promise* and *ask* have Object Control (beyond what markedness theory would normally predict), or we can explain the possibility of subject-control in the mature grammar -- but not both.

6.1.3. The word-formation rule of NP-Incorporation provides a possible solution to this problem. Suppose that the PMD is inviolable. Then in order for *promise* and *ask* to allow Subject Control, it must be the case that they do not take true NP objects in the relevant subcategorization frame. In previous analyses, this has been an impossible position to maintain, since it seems obviously counterexemplified by the data. But if the NP "objects" in (88) and (89) are actually part of the complex verb, then these verbs could be Subject Control verbs, without violating the PMD:

- (90) $NP_i - [{}_V V - NP_j] - [\bar{S} \text{ PRO}_i \text{ to VP}]$
 $[John]_i \quad [{}_V \text{ promised-Bill}_j][\text{PRO}_i \text{ to wash the dishes}]$
 $[John]_i \quad [{}_V \text{ asked -Bill}_j][\text{PRO}_i \text{ to be allowed to leave}]$

In other words, we could attribute the possibility of Subject Control with

these verbs in the mature grammar to the fact that they do not really violate the PMD, given the proper analysis of the VP. We could then attribute the great difficulty encountered by children in the acquisition process to their being misled by the false -- but very natural -- analysis of the indirect object NP as a true object in \bar{V} . The configuration in (91) is perfectly compatible with general properties of grammar, provided that object control is assumed:

(91) $[_V \text{ V } - \text{ NP } - [_{\bar{S}} \text{ PRO } - \text{ to } - \text{ VP }]]$

This is in contrast to the Double Object construction, where there is a clear violation of the adjacency condition on Case assignment to the second NP unless the first NP is incorporated. (Recall that *to*-infinitives do not need to be assigned Case by the governing verb.) Therefore, it is natural for the child to assume that the indirect object in (88-89) is a true object in \bar{V} , until he or she recognizes the key to the puzzle; that the verbs which superficially violate the PMD in the adult grammar are simply a subset of the Native stem class verbs that are subject to NP-Incorporation.

It is thus not coincidental that *promise* and *ask* both occur independently in true Double Object constructions:

- (92) a. Jenny [promised Janice] [a quiet evening]
 b. We [asked the prisoner] [the whereabouts of his battalion]

Since these verbs allow either NP or \bar{S} as the direct object argument, it follows that when an indirect object appears, it can be incorporated in either construction.

It is perhaps worth pointing out that the possibility of NP-Incorporation does not necessarily imply that the verb is a Subject Control verb. Rather, the possibility of NP-Incorporation simply makes Subject

Control possible, by allowing these verbs to specify a control relation that would otherwise violate the PMD. Thus *tell*, which is subject to NP-Incorporation, nevertheless is always an Object Control verb:

- (93) a. Andrew told a funny story to Pauline
 b. Andrew told Pauline a funny story
- (94) a. [Andrew]_i told Pauline_j [\bar{S} PRO_j to be careful]
 b. *[Andrew]_i told Pauline_j [\bar{S} PRO_i to (have) come home]

It is reasonable to ask why this should be so, since we might expect *tell* to allow Subject Control in the NP-Incorporation structure, under certain pragmatically determined conditions, analogous to the Italian structures discussed by Manzini (1980). Apparently this is not the case, however. A possible explanation for this is that under normal circumstances, the incorporated NP is linked to an A-position in \bar{V} :

- (59) Andrew [\bar{V} told - Pauline_i] [e]_i [\bar{S} PRO_i to be careful]]

(Actually, the empty A-position could appear on either side of the complement clause, since neither it nor the infinitival need be assigned Case by the governing verb.) The empty A-position in \bar{V} c-commands the control clause, so it is a possible antecedent for obligatory control; therefore Object Control is obligatory, by virtue of the PMD. Notice, however, that this implies that there is no empty A-position in the corresponding structures in (88-89), or else subject control would be blocked here too. Presumably the possibility of leaving out the A-position in \bar{V} is a marked option allowed by UG as a special property of certain verbs.³²

6.1.4. The distinction between *tell* and *promise* with respect to the presence of the empty A-position in \bar{V} -- i.e., the distinction between (95) and (90) -- is also reflected in a number of other phenomena besides that of subject

control.

First of all, in structures corresponding to (92) and (93), the incorporated indirect object is able to function as a grammatical antecedent for a reflexive pronoun embedded within an NP direct object only in those structures where there is an indirect object A-position in \bar{V} :

- (96) a. [Andrew]_i [\bar{V} [_V told the boys_j] [stories about each other_j] [e]_j]
 b. [Andrew]_i [\bar{V} [_V told Pauline_j] [a story about herself_j] [e]_j]
- (97) a. ??[Andrew]_i [\bar{V} [_V promised the boys_j] [stories about each other_j]
 b. ??[Andrew]_i [\bar{V} [_V promised Pauline_j] [a story about herself_j]

The movement facts corroborate this account. First of all, WH-movement is impossible from the incorporated position in both Double Object structures, as we expect:

- (98) a. *Who did Andrew tell — a funny story?
 b. *Who did you promise — a new record?

In the Subject Control structures, WH-movement of the indirect object is always blocked:³³

- (99) a. *[Who]_i did [you]_j promise [PRO_j to wash yourself_j]?
 b. *These are the girls [who]_i [he]_i promised [PRO_j to behave himself_j]

In (99), the reflexive pronoun in the control clause requires that PRO be controlled from subject position. But this requires that the indirect object be incorporated into the verb, which is incompatible with WH-movement since *Move α* cannot apply to the subpart of a word. Surprisingly, however, the indirect object can move in the Object Control cases with *tell*:

- (100) a. [Who]_i did [you]_j tell [e]_i [\bar{S} PRO_i to wash himself_i]?
 b. These are the girls [who]_i [he]_j told [e]_i [\bar{S} PRO_i to behave themselves_i]

The contrast between (100) and (98a) suggests that the status of the indirect object in (96) is actually structurally ambiguous. Since objective Case need not be assigned to the infinitival clause in (100) as it must to the direct object in (98a), the indirect object can appear in \bar{V} adjacent to the verb and be assigned objective Case. The distinction between this structure and the NP-Incorporation structure is string-vacuous.

At first glance, the NP-movement facts seem to be directly analogous:

- (101) a. [John]_i was told [e]_i [\bar{S} PRO_i to come home] (by Bill)
 b. *[John]_i was promised [\bar{S} PRO to come home] (by Bill)

However, it seems the ill-formedness of (101b) may be due to pragmatic criteria of the type discussed by Manzini (1980). Although (101b) is ungrammatical, (102a) is not, despite the fact that the two structures are equivalent, apart from the internal propositional structure of the complement clause:

- (102) a. [John]_i was promised [e]_i [\bar{S} PRO_{arb} to be allowed to come home]
 b. *[Jane]_i promised [John]_j [\bar{S} PRO_{≠i} to be allowed to come home]

Note that (102a) cannot be accounted for in terms of Subject Control at S-structure, because the trace in VP would invoke the PMD. Therefore it must be that passivization somehow manages to nullify the Subject Control requirement as a byproduct of suppressing θ -role assignment to subject position. The resulting structure has the properties of Non-obligatory control, where the PRO subject of the control complement has grammatically arbitrary reference. The intended reference is deduced on the basis of pragmatic criteria, determined in part by the compositional content of the complement clause. Although (102a) is perfectly acceptable, the corresponding active

"source" structure (102b) is not, since Subject Control is obligatory when the θ -role is assigned to subject position. The grammaticality of (102a) also suggests that *promise* allows the same structural ambiguity that *tell* does in (96): the "object" can appear either as an incorporated NP or as a true complement in VP; the distinction between the structures is string-vacuous. But *promise*, unlike *tell*, is a Subject Control verb, so the indirect object must always appear as incorporated NP unless the Subject Control property is suppressed as a result of passive morphology, as in (102a).

The fact that subject control requirements are suppressed together with the assignment of the subject θ -role in (102a) supports our contention in Chapter 3 that the ungrammaticality of passive control structures such as (103) is due to the theory of Case, and not due to the theory of Control:

- (103) a. *It was tried [_S PRO to come home]
 b. *It was expected [_S PRO to have fun]
 c. *It wasn't known [_S what PRO to do]

Recall that only transitive verbs have passive counterparts in English, because passive morphology always absorbs objective Case. Since verbs do not assign Case to their infinitival complements, no control verb will have a passive form unless it also takes an NP argument to which it assigns Case, as in (102a). This contrasts with tensed clause complements, which can move to a non-A-position and leave a trace in VP to be assigned Case by the governing verb. Since the verb assigns Case to these complements, passive morphology is possible:

- (104) a. It was expected that John would have fun
 b. It wasn't known what John did

The inability of Subject Control verbs to undergo passive morphology is basically a function of the fact that they do not assign Case in VP. The

verbs *promise* and *ask* only superficially counterexemplify this claim, since they only allow true subject control by virtue of NP-Incorporation of the indirect object because of the PMD.

6.2. θ-Role Assignment to Subject Position

6.2.1 It is a general property of objective Case assignment that a verb will only assign Case to an object complement if it assigns an external θ-role to subject position. Chomsky (1981), following a discussion of Burzio (1981), formulates the following biconditional:³⁴

- (105) A verbal element assigns Case to an NP that it governs if and only if it assigns a θ-role to its subject.

Given (105), all passive participles and raising verbs such as happen, seem, appear, prove, etc. are unable to assign Case to an indirect object, by virtue of the fact that they assign no θ-role to subject position:

- (106) a. It seems [to me] [that John is crazy]
 b. [John]_i appears [to us] [[e]_i to need a haircut]
 c. [The solution]_i was proved [to us] [[e]_i to be very simple]
- (107) a. *It seems me that John is crazy
 b. *John appears us to need a haircut
 c. *The solution was proved us to be very simple

Now the following examples appear to pose problems for the full empirical coverage of the biconditional in (105):

- (108) It strikes me [that John is stupid]
- (109) a. [John]_i strikes me [[e]_i as stupid]
 b. [John]_i impressed all of us [[e]_i as very intelligent]

Chomsky (1981) points out that the sentences in (108) must be interpreted as Raising constructions, if the Projection Principle is to be maintained. Clearly, the verbs *strike* and *impress* take a propositional complement at LF.

The only θ -role assigned to the main clause subjects in (109) is that of the subject of the propositional complement; therefore, the main clause subject position is not a θ -position. Nevertheless both of these verbs take indirect object NPs which are assigned the θ -role of Experiencer. In order for θ -role assignment to be possible, these verbs must assign Case to the indirect objects. But this should be impossible, given (105), since these verbs assign no θ -role to the subject position.

As Chomsky observes, it would be undesirable to complicate the formulation of (105) so as to specifically exclude the structures in (108-109) from its domain. Nevertheless, it would be nice to have an account for these examples; this is where the NP-Incorporation rule is again relevant. If we assume that the "objects" in these structures are actually incorporated into the verb, then the issue of Case assignment is irrelevant, since the θ -role can be assigned directly to the incorporated position:

- (110) a. It [\bar{V} [V strikes - me_i] [e]_i [that John is stupid]]
 b. [John]_i [\bar{V} [V strikes - me] [e]_j [[e]_i as stupid]]

In other words, just as the NP-Incorporation rule produces superficial violations of the adjacency condition on Case assignment and the Principle of Minimal Distance, so it also is responsible for superficial violations of the biconditional in (105).

6.2.2. Once again, there is empirical evidence supporting this analysis. As expected, WH-movement of the incorporated NP is impossible:

- (111) a. *[Who]_i does it strike [e]_i that John is crazy?
 b. *Bill is the guy [who]_i John struck [e]_i as stupid
 c. *The people [who]_i John impressed [e]_i as very intelligent were rather naive.

This contrasts with the indirect objects of the verbs in (106) which are not incorporated:

- (112) a. [To whom]_i does it seem [e]_i that John is crazy?
 b. [To whom]_i does John appear [e]_i to need a haircut?

Similar facts hold for NP-movement in passive constructions:³⁵

- (113) a. *[Bill]_i was struck [e]_i that John is crazy
 b. *[We]_i were struck [e]_i (by John) as stupid
 c. *[All of us]_i were impressed [e]_i (by John) as very intelligent

The facts of (111) and (113) are exactly what the NP-Incorporation solution for these apparent counterexamples to (105) predicts, since there are corresponding structures in French.

It is perhaps worth emphasizing that there is no straightforward account for the movement facts in any analysis of these constructions which does not invoke NP-Incorporation. It has been suggested by Bresnan (1979) that the ungrammaticality of (113b,c,) follows from the theory of Control which she assumes to be involved here. But this solution would not account for (113a), where Control is clearly irrelevant.³⁶ Moreover, the ungrammaticality of (113a,b) cannot be attributed to the lexicon, simply by claiming that *strike* "impress" just happens to lack a passive participle. This is shown by the fact that *strike* also has a passive version of a transitive subcategorization frame, which allows the Experiencer NP to appear in subject position:³⁷

- (114) [All of us]_i were struck [e]_i by John's stupidity

Thus the NP-movement facts are quite mysterious under the assumption that the postverbal NPs in (108-109) are true objects of the verb. As for the WH-movement facts, I know of no other account of them, in any terms.

6.3. Some Exceptional Adjectives

6.3.1. The NP-Incorporation rule also provides a possible explanation for the exceptional property of a small set of adjectives in English. Recall that adjectives are not Case assigners, since they lack the [-N] feature. This is reflected in the fact that virtually all English adjectives are unable to take bare NP complements. Instead, adjectival objects are normally subject to the rule of *of*-Insertion, which adjoins a dummy Case marker to the postadjectival NP, as observed in Chapter 1.

There is an apparent exception to this pattern, however:

- (114) a. John is [_A very near the bridge]
 b. [_A How near the bridge] John is!

In (114), *near* appears to behave simultaneously like an adjective and a preposition. Although it takes the preadjectival modifiers *very* and *how*, it seems to be able to assign Case to its object -- just like a preposition.

Clearly, *near* is exceptional in some way. Maling (1980) discusses the historical cause of this. Like the words *worth* and *like*, *near* was a true adjective in earlier stages of the language, and it assigned oblique Case to its object, as is still possible for German adjectives, as observed by Van Riemsdijk (1980). At some point, however, English lost the system of oblique Case, and subsequent generations of speakers were forced to reinterpret the oblique Case assignment structures in other terms. Maling shows that *worth* and *like* have in fact become prepositions, in spite of their meaning. Moreover, it seems that *near* can function as a verb or preposition in addition to its original adjectival status:

- (115) a. John put the book near him
 b. The soldiers should be nearing the bridge soon

Nevertheless, *near* can still function as an adjective. Like other adjectives, its object often appears within a PP:

(116) The soldiers are very near to the bridge by now

Surprisingly, however, the structure in (114) has also survived, despite the fact that it is apparently superfluous, given (116), and despite the fact that it is without parallel in other adjectival complementation structures.

It is intriguing to consider how exactly speakers of English choose to rationalize the behaviour of this adjective within the grammar of Modern English. Rather than discuss all of the hypotheses that come to mind, I would like to explore the possibility that is offered by the NP-Incorporation rule introduced in this chapter. Specifically, I would like to suggest that NP-Incorporation is exceptionally extended so as to apply to the adjectival stem *near*, as a special lexical property. In other words, rather than assume that *near* violates the principles of Case theory by assigning Case to its object, we can suppose that the "object" is actually incorporated within the structure of a complex adjective:

(117) [_A very [_A near - the bridge]]

Thus the apparent exceptionality of (114) would simply be reduced to a special extension of the word-formation rule of NP-Incorporation, analogous to that observed in certain dialects with respect to the passive participle *given*. Note that *near* is a monosyllabic stem, so it meets the Native stem class criterion. Moreover, this exceptional lexical property can plausibly be induced on the basis of overt positive evidence such as the structures in (114) -- unlike the supposedly exceptional properties of some of the Double Object verbs discussed in Section 2.

6.3.2. There are two pieces of grammatical evidence suggesting that something like this is actually going on here. First Jackendoff(1977) observes that *enough* normally appears immediately after the adjective that it modifies:

- (118) a. John is not angry enough at his brother to kill him
 b. *John is not enough angry at his brother to kill him
 c. *John is not angry at his brother enough to kill him

Let us assume for the sake of discussion that the placement of *enough* is also determined by an arbitrary rule of word-formation. This will allow us to use it as a diagnostic for the adjectival status of the preceding constituent, without forcing us to develop a genuine explanation for this fact. Now consider the following phenomenon, noted by Maling (1980):³⁸

- (119) Is John [_A [near the bridge] enough] for you to see him?

The placement of *enough* in (119) makes perfect sense if the preceding NP "object" is in fact incorporated within the structure of the adjective; it is utterly mysterious otherwise.

Now consider our familiar test for NP-Incorporation based on WH-movement:

- (120) a. Which bridge was John nearing — ?
 b. Which bridge was John sitting near — ?
 c. Which bridge was John very near to — ?
 d. *Which bridge was John very near — ?

When *near* is a verb or preposition, as in (120a,b), WH-movement is always possible, as we expect. Moreover, movement is even possible from within an AP, if the WH-trace is the object of a preposition, as in (120c). However, in the structure where the apparent violation of the principles of

Case theory suggests the involvement of NP-Incorporation, movement is impossible -- as we predict. Once again, this failure of WH-movement is utterly mysterious, if the NP is a true object of the adjective, given the grammaticality of (120a-c).

So it seems that the existence of the NP-Incorporation rule has allowed this structural "relic" of an earlier stage of the language to survive only at a superficial level. By accounting for (114) in terms of NP-Incorporation, speakers of English manage to integrate *near* into the grammatical system of the language, but the consequence of this is that the modern construction is subject to the special limitations of structures that are derived by word-formation rules.

7. This concludes our discussion of the word-formation rules of NP-Incorporation and Particle Incorporation. Both of these rules were forced on us -- directly or indirectly -- by the assumption that the theory of grammar does not allow for category-specific rules of phrase structure. At first glance, the Verb-Particle and Double Object constructions appear to call for a special wrinkle in a categorial rule defining the structure of \bar{V} in English. These constructions also appear to involve violations of the adjacency condition on Case assignment, which was invoked crucially in Chapter 3 to derive the order of constituents in \bar{X} . Moreover, the Double Object construction seems to require ordered strict subcategorization frames in the lexicon -- a type of stipulation that is otherwise unneeded in the theory of grammar, even without a categorial component.

The word-formation account of these constructions avoids the pitfalls of introducing ad hoc complexity into the theories of phrase structure, Case assignment, and strict subcategorization by attributing their arbi-

trary properties of cross-categorial asymmetry and fixed linear order of complements to the involvement of two quasi-morphological rules: NP-Incorporation and Particle Incorporation. The output of these rules interacts with strict subcategorization frames in exactly the same way that clitic structures do -- a natural analogy, given the fact that both types of verbal complexes are derived by rules of the word-formation component.

In addition, the word-formation analysis provides natural solutions to a large number of complex and otherwise mysterious problems associated with this construction, including the "obligatory" Double Object constructions involving Possessor Indirect Objects, the curious array of facts involving syntactic movement, and the limitation of the construction to verbs of a specific morphological stem class. In each case, the arbitrary, language-particular properties which often differ from one dialect to the next were traced to the operation of the word-formation rule, while the properties which these constructions share with clitic constructions in other languages were shown to follow from general principles of grammar.

In no case was it necessary to stipulate a direct link between a given word-formation rule and any particular array of postverbal complements. Rather, the link between subcategorization frames and the output of NP-Incorporation is applied "blindly" by general properties governing clitic-like configurations in Universal Grammar. Unlike most previous accounts, the NP-Incorporation analysis is not forced to stipulate these properties on an ad hoc basis for each construction; instead, the particular array of facts follows either from the special properties of the word-formation rules, or from the interaction of the output of these rules with other components of the grammar.

Finally, we have seen that NP-Incorporation can be naturally invoked to explain the real cause of certain superficial violations of the Principle of Minimal Distance and of the principle which is responsible for the correlation between objective Case assignment and nominative Case assignment to subject position. In addition, it seems that the exceptional Case-assigning properties of certain adjectives may be amenable to an NP-Incorporation account. Further below, we shall see that this rule is also responsible for some apparent violations of the adjacency condition on Case assignment with respect to tensed clause complements that follow indirect object NPs in \bar{V} . However, the pattern of these violations is systematically obscured by phenomena associated with θ -role assignment to non-bridge verbs, and we will therefore postpone discussing them until Chapter 6.

The nature of the word-formation rules discussed in this chapter raises a number of interesting issues that I will not be able to pursue further here. In particular, the NP-Incorporation rule suggests that phrasal structure can be embedded within the substructure of a word by rules of word-formation. This is surprising, given previous assumptions about the interaction of words and phrases; on the other hand, it is not an unnatural result, if all categorial features originate in the lexicon as features of lexical entries. Moreover, if prenominal adjectives are also adjoined by rules of word-formation, as suggested in Chapter 4, then the prenominal complex adjectives discussed by Nanni (1980) would appear to require an analogous account:

- (121) a. [_N an [_A easy - [to clean]] carpet]
 b. [_N a [_A hard - [to solve]] problem]

On the other hand, these complex adjectives are syntactically restricted in ways which the postverbal incorporated NPs are not, suggesting that some further refinements are in order.³⁹

The NP-Incorporation rule and the discontinuous verbal complex in Dutch together pose significant problems for traditional assumptions about the nature of the interaction between the rules of word-formation and lexical insertion with the principles governing X-bar phrase structure, strict subcategorization, and θ -role assignment. The kind of system that appears to emerge from this disruption is rather appealing, however. The distribution of phonological words is accounted for by two quite distinct rule systems. The first of these involves the rules of word-formation, which group words together into derived complexes that cluster around the head position of phrases -- including the two head positions in \bar{V} and the INFL position in S, among others. The internal constituent structure of these complexes is characterized by arbitrary and invariant order, cross-categorical asymmetry, and significant cross-linguistic differences. Moreover, the complex structures created by these rules can sometimes be spread over more than one head position defined by the X-bar system, as determined by the properties of lexical insertion.

The second rule system is that of true phrase structures. The only rules and principles directly governing this system are those of category-neutral X-bar theory. In addition, however, the principles of Case assignment and θ -role theory interact with (i) the θ -grids and feature matrices of lexical entries, and (ii) the structural configurations defined by the word-formation rules and the X-bar system, so as to create an extremely complex array of phenomena.

FOOTNOTES: CHAPTER 5

1. Actually, if the categorial rules allow for two NP positions in \bar{V} , then some stipulation would be required for verbs which subcategorize for just a single NP complement, to ensure that it appears in the position adjacent to the verb.
2. Jaeggli (1980) suggests that the first object may appear within the \bar{V} level, while the second object appears at the $\bar{\bar{V}}$ level. Then Case could be assigned to the second object by $\bar{\bar{V}}$, under adjacency. Although this bears some similarity to the complex verb analysis in terms of grouping the verb and the first NP into a single constituent, it differs crucially in maintaining the traditional assumption that the first NP is a distinct syntactic constituent in \bar{V} . This has significant empirical consequences, as we shall see below.
3. One exception is Oehrle (1975), who maintains that the two structures are conditioned by distinct strict subcategorization frames. In Oehrle's account, the tendency of many verbs to have both subcategorization frames is accounted for in terms of a lexical redundancy rule, along the lines proposed by Jackendoff (1975). A similar approach has been suggested by Bresnan (1980) in terms of "lexical" rules which permute grammatical functions; see also Baker (1979). These accounts are undesirable for at least two reasons. First, they are incompatible with the restrictive theory of subcategorization based on positions in θ -grids that was developed in Chapter 1. Second, these theories make a very weak empirical claim with respect to the "dative" verbs; they allow for any verb to arbitrarily lack either subcategorization frame, making the theory almost impossible to falsify on the basis of empirical evidence.

4. There may be a direct counterpart to the English rules in Dutch.

As Koster (1975) observes, Dutch has verb-particle constructions similar to those found in English, suggesting a Particle Incorporation rule. In addition, Koster observes that the indirect object must precede the direct object in \bar{V} . Recall that the Dutch VP has two head positions, one of which is at the beginning of \bar{V} . We might then assume that the indirect object may appear in an incorporated position within the \bar{V} -initial head position, immediately following the clitics. If this is correct, then the assignment of Case to the direct object would proceed just as in English. Moreover, it would imply that Dutch really does have a structure corresponding to the English "Particle Movement" construction, at a more abstract level; the superficial effect is quite different, however, because NP-Incorporation applies to the \bar{V} -initial head position, while Particle-Incorporation applies to the \bar{V} -final head position. The Dutch equivalent of the "particle movement" structure will only be evident in structures corresponding to those discussed in Section 5 below.

5. Recall that the cross-categorial asymmetries in this domain may serve as a functional aid to vocabulary acquisition.

6. In this sense our account is parallel to that offered by the phrase structure formula in (5), which also treats the cross-categorial asymmetry with respect to the two constructions as a unitary phenomenon; cf. Jackendoff (1977). See also Emonds (1981) who argues that both alternations can be attributed to a single rule of English syntax, which he refers to as "Generalized NP- α Inversion".

7. More precisely, if the θ -position is co-indexed with the corresponding slot in the verb's θ -grid by virtue of θ -role assignment (as proposed

in Chapter 6), then the θ -position is A-associated with the verb. Since the Case feature is absorbed within the verbal complex, the θ -position is also A-associated with the Case feature, as required by Condition (15') in Chapter 3. See Borer (1981) for a slightly different characterization of the link between the clitic and the subcategorized position.

8. The existence of these word-formation rules in English also has some very interesting results for the theory of reanalysis and the account of preposition stranding constructions. See Chapter 7 for discussion.

9. These verbs also have no counterparts in the *for*-Dative construction that we will discuss in Section 3, as the reader can verify by substituting *for* for *to* in (16).

10. Some of these subtle distinctions may follow from the rule of θ -role assignment to the incorporated position, as we shall see below; see also fn. 11.

11. Actually, we must understand the relation of "possession" rather loosely, so as to subsume not just inalienable possession, but also perception -- which corresponds to "possessed knowledge", in some sense. This can be observed in the contrast between (i) and (ii), noted by Oehrle (1975):

(i) John taught French to Bill

(ii) John [taught Bill] French

In (ii), we understand that Bill came to acquire some knowledge of French as a result of John's teaching, but this is not a necessary implication in (i). This is due to Condition (19), which requires that the incorporated NP be assigned the θ -role of Possessor of the direct object; thus Bill "possesses" French (or a knowledge of it) in (ii). There is an obvious

analogy here to the notion of inalienable possession of an idea in (13b).

12. It may be that certain inherent reflexive constructions and "middle voice" constructions can be handled in an analogous fashion. We will not pursue these possibilities here, however.

13. We will reformulate the θ -criterion again in Chapter 7, by requiring a direct link between A-positions and slots in θ -grids.

14. Jaeggli's (1980) discussion of these constructions assumes that the Possessor θ -role is only assigned to the clitic position in the inalienable possession (obligatory cliticization) constructions. This approach is unable to capture the insight of Condition (19).

15. I am grateful to Hagit Borer for pointing out to me the analogy between the Spanish inalienable possession construction and the related construction in English.

16. Montalbetti (1981) observes that cliticization of the indirect object appears to be obligatory in "subject pro-drop" constructions. I have no explanation for this.

17. On Clitic Doubling constructions see Jaeggli (1980) and Borer (1980, 1981).

18. Jaeggli (1980) observes the analogy between (30a) and (31a) with the Spanish constructions. I am also grateful to Isabelle Haik for discussion of the French facts.

19. Mario Montalbetti (personal communication) suggests that (32b) may be ungrammatical for an independent reason, namely that the PP a Argentina may not be a subcategorized argument of the verb. Regardless of the status of this example, our claim still stands that there are no

cliticized indirect objects that violate (19).

20. Recall that Oehrle (1975) argues that distinct subcategorization frames are required in order to account for the various types of indirect object constructions. This move is unnecessary, however, if the ungrammaticality of (15), (16), and (18b) can be deduced from general principles. The well-known *give/donate* contrast is discussed in Section 5.

21. The fact that this structure involves obligatory NP-Incorporation is significant, since the structure also involves inalienable possession. Notice, however, that the Incorporated NP represents the "Possessed" NP rather than the "Possessor". This suggests that some refinement of Condition (19) is in order, so as to capture the fact that the notion of possession is involved in both constructions, even though a different θ -role is assigned to the object in each case. At any rate, the contrast between (35a) and (35b) supports the NP-Incorporation analysis of the "Particle-Movement" structure, since it shows a principled connection between the obligatory incorporation structure in (35a) and the cases discussed in Section 2.

22. In addition to Jackendoff and Culicover (1971), see Langendoen, Kalish-Landon, and Dore (1974), Fodor (1978), and the references cited there. For an alternative grammatical account of the WH-movement facts, see Culicover and Wexler (1977), who attribute the ill-formedness of (43-46) to a "freezing" principle. They suggest that the derived Double Object structure is "frozen", under the assumption that the rule involves adjunction to V -- a structure which cannot be generated by the categorial component in their system. In terms of derived structure, this bears some similarity to our account, but it is unable to cover the full range of facts that are encompassed by the NP-Incorporation solution. In particular, the Verb-

Particle structures appear to be incompatible with an account in terms of the Freezing Principle; cf. also section 4 of this chapter and our discussion of reanalysis in Chapter 7.

23. This analysis has been proposed by Perlmutter and Postal in the "Relational Grammar" framework, as far back as their LSA Summer Institute Lectures in 1974. Bresnan (1980) has proposed an analogous account in terms of "lexical" rules which permute configurations of grammatical functions in lexical entries. See also Marantz (1981).

24. There are at least two possible explanations for (52c-d). First, if preposition stranding is dependent upon reanalysis, then these sentences could be ruled out on the grounds that reanalysis is impossible in this context; see Chapter 7 for discussion. A second possibility would be to attribute this to a condition blocking conflicting Case assignment to a single A-chain, as noted in Chapter 3.

25. See Chapter 3, Section 3 for discussion.

26. The dialectal extension of the incorporation structure to passive participles seem to be severely limited, perhaps to just a few lexical items. For instance, D. Nash informs me that he finds the following gradation of acceptability in his dialect:

- (i) A book was given my mother today
- (ii) ?A telegram was sent John last week
- (iii) *This letter was written my aunt a long time ago

27. Significantly, Baker (1979) reports that children are apparently unaware of the enclitic status of unstressed object pronouns until rather late in the period of acquisition, and commonly accept sentences such as (53).

It is hard to know exactly what to make of this, given markedness theory, especially if negative evidence is not taken into account.

28. Recall that the structures in (57) satisfy Condition (19) in an extended sense of "possession"; see fn. 11 for discussion.

29. Moreover, it seems that creative additions to the Native stem class are common, as in the following example attributed to S. Pinker, pointed out to me by T. Roeper:

- (i) Would you xerox me a copy of this?
- (ii) *Would you photocopy me this article?

Note that *xerox*, unlike *photocopy*, meets the phonological criteria for Native stem class membership. Similar creative additions can be found in Verb-Particle constructions, as in (iii):

- (iii) John likes to rev up his engine

30. Emonds (1981) suggests an alternative account of this phenomenon in terms of his rule of "Generalized NP- α Inversion". He suggests that this language-particular rule is limited to constructions involving the "primary vocabulary" of English, which corresponds to the Native stem class. Actually, this cannot be true for all of the structures subsumed under his rule, as shown by the grammaticality of the inversion structure in (i):

- (i) It is hot, observed Bill

31. Chomsky found that children consistently interpreted these verbs as being roughly equivalent in meaning to *tell* -- but only in the control structures. When an NP or tensed clause complement was substituted for the control clause, the meaning of the verbs was correctly understood. Actually, Chomsky's examples with *ask* involved embedded infinitival questions, unlike

our example in (88b). However, it seems that the embedded question structure has some of the properties of Non-obligatory Control in the adult grammar, as if they involved a grammatically arbitrary reference of PRO, with pragmatically determined control. In particular, it seems that the movement facts differ somewhat; cf. fn. 33.

32. It is interesting to observe that *promise* and *ask* only marginally allow the indirect object to appear in \bar{V} preceded by the dummy preposition *to*, as we might expect:

- (i) Jenny told a nice story to Janice
- (ii) ??Jenny promised a quite evening to Janice (cf. 92a)
- (iii) ?*We asked the whereabouts of the batallion to the prisoner (cf. 92b)

33. The facts with *ask* are slightly more complicated. In the structure directly parallel to (99), movement is blocked:

- (i) *[Which officers]_i did [John]_j ask [e]_i [PRO_j to be allowed to cut his hair] ?

But if an embedded interrogative clause is substituted, subject control seems to be possible:

- (ii) [Which people]_i did [John]_j ask [_S which city [_S PRO_j to visit] ?

This suggests that the PRO subject of the embedded interrogative is actually arbitrary in reference as far as the grammar is concerned; i.e., it is a case of Non-obligatory Control. See also fn. 31 for related discussion.

34. This biconditional should probably be adjusted so as to apply only to objective Case assignment, given the fact that passive participles can assign oblique Case, as in the passivized indirect object constructions; see also Chapter 1, Section 4.

35. Actually, there are no passive counterparts to (106), either:

- (i) *John was seemed/appeared (to) that the weather was very unseasonal

This can be accounted for, however, by assuming that only verbs that assign Case may passivize in English. Note that this cannot be extended to cover (113) unless the NP-Incorporation account is accepted.

36. Bresnan suggests that Raising constructions should be accounted for in the same terms as control structures by means of "control equations". The fact that this solution requires an entirely different account of the tensed clause complementation argues against it, however. Moreover, if Control and NP-Movement are collapsed, it is impossible to account for the shared properties of NP-Movement and WH-Movement with respect to the ECP and the bounding conditions; cf. Chomsky (1981) for discussion.

37. Interestingly, there is no active version of (114):

- (i) *John's stupidity struck all of us

This supports the contention that *strike* assigns no θ -role to subject position. Further, it suggests that the propositional complement in (108-109) is in some sense "agentive", taking the term in a loose sense. Then the *by*-phrase in (114) is a substitute for the propositional complement, and *strike* strictly subcategorizes for it as a complement, ruling out (i).

38. Maling cites this structure with *worth*, noting its marginal status. Significantly, it is perfectly grammatical with *near* however:

- (i) Is John near enough to the boat for you to see him?
(ii) ?*Is John near to the boat enough for you to see him?

Thus *enough* always appears immediately after the adjectival head.

39. In particular, Nanni observes that only simple infinitival clauses may appear after prenominal adjectives. A natural account of this, given Chomsky's (1977, 1981) analysis of Tough-constructions, is that *Move α* cannot apply within the structure of a word, ruling out internal WH-movement. But then we would be unable to explain why incorporated NPs may contain relative clauses with internal WH-movement. In fact, the whole issue of the internal syntactic structure of the incorporated NP raises significant questions with respect to the relationship between syntax and word-formation, but I will not attempt to resolve them here.

CHAPTER 6: THE COMP POSITION IN \bar{S}

In this chapter I explore a number of related issues that are all associated in one way or another with the COMP position in \bar{S} . Specifically, I argue that COMP is the head position of \bar{S} , drawing evidence from phenomena involving the Empty Category Principle, the Case Resistance Principle, strict subcategorization, and θ -role assignment. The discussion will cover a broad range of clausal complement structures, in some cases returning to issues that were raised in previous chapters. Our story begins with the Empty Category Principle (ECP) introduced by Chomsky in his Pisa lectures, and explored in considerable detail in Chomsky (1981).

1. Proper Government and the ECP

1.1 There is a fundamental asymmetry between the subject position of S and the object position in VP with respect to WH-movement:

- (1) a. [Which book]_i did you say [\bar{S} that [_S Ben read [e]_i]] ?
 b. [Who]_i does Carol think [\bar{S} that [_S Roger's book impressed [e]_i]] ?
- (2) a. *[Who]_i did you say [\bar{S} that [_S [e]_i read Roger's book]] ?
 b. *[Which book]_i does Carol think [\bar{S} that [_S [e]_i impressed Ben]] ?

The ungrammatical sentences in (2) illustrate the familiar "that-trace" effect, which has been discussed at considerable length in the literature on formal syntax.¹ Chomsky (1981) proposes to account for the contrast between subject and object position with respect to extraction in terms of the theory of Government. Specifically, he observes that the object trace in (1) is governed by the verb in VP, while the subject trace in (2) is governed only by INFL. (Recall that a verb governs and assigns objective

Case to the subject of a tensed clause.) He then suggests that the ungrammaticality of (2) can be attributed to the following principle of grammar:

(3) The Empty Category Principle:

$[_\alpha e]$ must be properly governed.

Proper government is defined as in (4):

(4) α properly governs β if and only if

(i) α governs β , and

(ii) α is lexical.

Condition (4ii) is intended to prevent the Agreement element in INFL from counting as a proper governor, under the assumption that an element which bears only grammatical features is not lexical. (Chomsky assumes that it is the Agreement element in INFL which governs and assigns nominative Case to subject position; this differs from our assumption that it is the Tense feature that is responsible for this. This difference is not critical, however, since one might simply stipulate that INFL is not a proper governor, as Chomsky points out.²) Given this definition of proper government, the ECP derives the distinction between (1) and (2). The verb properly governs the empty category trace in (2), satisfying the ECP; but the subject trace in (2) is governed only by INFL, and the ECP is violated.

This is far from the end of the story, however. Extraction from subject position is not always ill-formed; if the complementizer that is eliminated from the sentences in (2), they become grammatical:

- (5) a. Who did you say read Roger's book?
b. Which book does Carol think impressed Ben?

Evidently, the absence of the complementizer in (5) somehow overcomes the subject/object asymmetry.

Recall that the Subjacency condition on syntactic movement requires that in constructions involving "long extraction", WH-movement must apply successive-cyclically through intervening COMP positions. This means that in all of the extraction structures considered thus far, there is a trace in the COMP position of the complement clause. Chomsky (1981) suggests that it is this trace which properly governs the subject position in (5):

- (6) a. $[Who]_i$ did you say $[\bar{S} [e]_i [S [e]_i \text{ read Roger's book }]]$?
 b. $[Which \text{ book}]_i$ does Carol think $[\bar{S} [e]_i [S [e]_i \text{ impressed Ben }]]$?

In order to allow the trace in COMP to count as a proper governor in (6), while still excluding the structures in (2), Chomsky adopts the following definition of government:

- (7) In the configuration $[\beta \dots \gamma \dots \alpha \dots \gamma \dots]$, α governs γ , if
- (i) $\alpha = X^0$ or is co-indexed with γ , and
 - (ii) where ϕ is a maximal projection, if ϕ dominates γ , then ϕ dominates α , and
 - (iii) α c-commands γ .

Condition (7i) allows a co-indexed category to count as a governor on par with a lexical head; Condition (7ii) defines maximal projections such as \bar{S} and NP as barriers to government; Condition (7iii) requires that a governor c-command the categories that it governs. Of relevance to the present discussion are (7i) and (7iii). (7i) allows a trace in COMP to count as a governor of the subject position of S, so that the subject position in (6) is governed from COMP. (7iii) requires that the trace in COMP c-command the subject position, however; thus the sentences in (2) are ruled out because the presence of the complementizer *that* blocks c-command:³

- (8) $*[Who]_i$ did you say $[\bar{S} [e]_i [\text{that}] [S [e]_i \text{ read Roger's book }]]$?

Since COMP branches in (8), neither the trace nor the complementizer can

c-command the subject position, blocking government. Although the complementizer might govern the subject position if the trace in COMP were not present, it is not co-indexed with the subject position, and therefore does not satisfy (7i).

1.2 Although this account derives the desired distinction between the grammatical structures in (1) and (5) and the ungrammatical examples in (2), the formulation of government in (7) seems strange. Why should a principle of core grammar treat government by a lexical head as being equivalent to co-indexing with a phrase? If the two cases of government really form a natural class, as the grammaticality facts suggest, then it is worthwhile attempting to revise the formal definitions of the theory so as to discover the underlying property that the two superficially unrelated structures share. It is perhaps significant that government by virtue of co-indexing is only required for the purposes of satisfying the ECP -- and then only in the case of extraction from subject position. The other subtheories of grammar -- in particular, the theory of abstract Case -- refer exclusively to government by a lexical head (X^0).

A second problem with (7) is the inclusion of the c-command condition in (7iii). This is included primarily to derive the contrast between (2) and (5) -- the *that*-trace effect. But the inclusion of the c-command requirement raises problems in other domains, as Chomsky observes. Specifically, Belletti and Rizzi (1980) provide evidence from the Italian *ne*-cliticization construction that the verbal complex in \bar{V} does not c-command the postverbal subject position adjoined to VP, even though it does c-command the constituents of \bar{V} .⁴ But Rizzi (1980) argues that the verbal complex must (properly) govern a position without c-commanding it, in apparent contradiction of (7iii).⁵

In fact, it also requires a complication in the definition of c-command

in order to allow the head to c-command all categories dominated by its projections; Chomsky proposes the following formulation:

(9) α c-commands β if and only if

- (i) α does not contain β , and
- (ii) Suppose that $\gamma_1, \dots, \gamma_n$ is the maximal sequence such that
 - (a) $\gamma_n = \alpha$
 - (b) $\gamma_i = \alpha^j$
 - (c) γ_i immediately dominates γ_{i+1}
 Then if δ dominates α , then either (I) δ dominates β , or
 (II) $\delta = \gamma_1$ and γ_1 dominates β .

The effect of this formulation is to allow for two distinct cases of c-command; (I) allows a constituent to c-command any constituent that is dominated by the node immediately dominating it; (II) allows a head to c-command all constituents dominated by any of its projections. The first case is sufficient to cover virtually all instances of c-command required by the Binding Theory, the theory of Control, and the theory of chains; (II) is required so that the c-command requirement in (7iii) can be satisfied in the case of government by a lexical head. Thus the decision to derive the *that*-trace effect by means of a c-command requirement not only complicates the definition of government; it also forces a complication in the definition of c-command so as to allow for proper government of the postverbal VP-adjoined subject position -- despite the evidence from *ne-cliticization* suggesting that c-command is actually blocked in this case.

All of the complications in the definitions of government and c-command arise from the need to define the structural relation holding between COMP and subject position in (5) as one of proper government -- while still excluding the structure in (8). This suggests that it may be worthwhile rethinking the way in which the ECP is satisfied in the case of extraction from subject position; we shall see that a possible solution lies in a

re-evaluation of the status of the COMP position itself.

1.3 As a point of departure, suppose that we return to a simpler formulation of c-command, which seems to be sufficient as long as c-command is not considered a precondition for government. Specifically, suppose that we adopt the definition in (10), repeated from Chapter 3:⁶

(10) C-command

In the configuration [... β ... α ... β ...], α c-commands β , where

- (i) α and β are maximal projections, and
- (ii) for some constituent γ , if γ dominates α , then γ dominates β .

Effectively, this definition is equivalent to case I in (9). The inclusion of (10i) is conceptually motivated to eliminate an overlap between government and c-command in the case of a head and its complements; but the Italian *ne*-cliticization facts suggest that (10i) may be too strong, perhaps implying that (10) should be further simplified, so as to include just Condition (ii).

Suppose that one of these formulations of (10) is essentially correct. The Italian *ne*-cliticization facts then follow straightforwardly; the verbal complex can only c-command the subcategorized constituents in \bar{V} , and *ne*-cliticization from the VP-adjoined position is blocked, as in Belletti and Rizzi (1980). But this implies that c-command cannot be a precondition for government, given the conclusions of Rizzi (1980) with respect to the possibility of extraction from the VP-adjoined position in Italian, so some other factor must be involved in the *that*-trace violations in (2).

The ungrammaticality of the subject extraction cases in (2) follows straightforwardly if we also return to a simpler definition of government, such as that of (11), again repeated from Chapter 3:

(11) Government

In the configuration [$\gamma \dots \beta \dots \alpha \dots \beta \dots$], α governs β . where

- (i) $\alpha = X^0$, and $\gamma = X^1$ (i.e. γ is an X-bar projection of α), and
 (ii) for each maximal projection δ , $\delta \neq \alpha^n$, if δ dominates β , then δ also dominates α .

As noted previously, this is essentially the definition proposed by Aoun and Sportiche (forthcoming), except for the formulation of (11ii), which permits government of the VP-adjoined position by V. This definition essentially allows only the head position of a categorial phrase to count as a governor. Then (2) is ruled out, without having to assume that c-command is a precondition for government, since the only head position governing the subject position is that occupied by AGR.

But this brings us back to the grammatical status of (5); if government is restricted so as to allow only for government from the head position of a phrase, then it is reasonable to ask why (5) does not involve an ECP violation as well. The solution lies in taking COMP to be the head position of \bar{S} . Suppose that at D-structure, the complementizer position may be either lexically filled as in (12a) or left empty as in (12b):

- (12) a. [\bar{S} [that] [S NP - INFL - VP]]
 b. [\bar{S} [e] [S NP - INFL - VP]]

It has been proposed (e.g. by Chomsky 1980) that WH-movement takes a WH-phrase to a position in COMP to the left of the complementizer in all cases. Suppose, however, that when the complementizer position is left empty at D-structure, the WH-phrase is free to substitute for this position. In this context, the WH-phrase would appear in the head position of COMP -- hence of \bar{S} , if \bar{S} is a projection of COMP -- and would be eligible to govern the subject position across S:

- 13) a. I wonder [\bar{S} [who]_i [S [e]_i read Roger's book]]
 b. [Who]_i do you think [\bar{S} [e]_i [S [e]_i read Roger's book]] ?

In (13a), the lexical WH-phrase appears in the head position in COMP, governing the trace in subject position; in (13b), successive-cyclic application of WH-movement has left a trace in this position, which governs in a similar fashion. We thus have at least two cases of government across S: government by the verbal head of VP in the case of \bar{S} -deletion, and government from the head position in COMP, either by a complementizer such as *for*, or by a WH-phrase.⁷

At this point, another problem arises. If COMP is permitted to govern the subject position of S, then we might expect the complementizer *that* to govern the trace in subject position in (2), satisfying the ECP. (Recall that any governor other than AGR counts as a proper governor, according to (3).) But the complementizer position only counts as a proper governor for the purposes of satisfying the ECP if it is co-indexed with the empty category in the subject position that it governs. This is also true for the infinitival complementizer *for*, as noted by Chomsky (1981):

- (14) a. I would hate [\bar{S} *for* [S Ben to kill the plants]]
 b. *[Who(m)]_i would you hate [\bar{S} [e]_i *for* [[e]_i to kill the plants]] ?

The presence of trace in COMP does not prevent the complementizer *for* from governing the embedded subject position -- despite the lack of c-command -- as shown by the case of extraction from object position in (15):

- (15) [What]_i would you hate [[e]_i *for* [Ben to kill [e]_i]]

In (15), *for* must govern the infinitival subject position in order for Case assignment to proceed; nevertheless this is not sufficient to satisfy the ECP in (14b), which is parallel in status to the sentences in (2).

Suppose, then, that we revise the definition of proper government

(16) Proper Government

α properly governs β if and only if

- (i) α governs β , and
- (ii) α is lexical, and
- (iii) α is co-indexed with β .

The inclusion of condition (iii) derives the desired distinction between the structure where WH or its trace properly governs a coindexed subject position and the structure where a lexical complementizer (such as *that*) governs the subject.⁸ (Although there is a co-indexed trace in COMP in (8), it is not in the head position, and so is unable to satisfy (iii).) In some cases, it is possible for a special rule to apply so as to co-index the lexical complementizer with the WH-trace in COMP. Pesetsky (to appear) interprets the French *que/qui* rule in these terms, and proposes a similar story for *that*-relatives in English; see also Kayne (1980) for related discussion.

1.4 Once again, problems arise with respect to government in VP by a lexical verb. Just as the c-command requirement in (7) raised difficulties for postverbal subject constructions, so the co-indexing requirement appears to be problematic for all cases of government by V. Specifically, (16iii) implies that a verb is co-indexed with the categories that it properly governs. At first glance, this appears to be an unwarranted assumption. Of course we could stipulate that a lexical head is co-indexed with any category dominated by one of its projections, but this would be no more than an artifice, designed solely to make government in VP technically equivalent to government from COMP. It is therefore worth considering whether there might be a more interesting explanation for the apparent equivalence in terms of proper government.

Recall that verbs assign θ -roles to their subcategorized complements in \bar{V} . It was suggested earlier that the verb has an internal unordered

representation of its argument structure, which I called the thematic grid. The θ -grid is composed of a set of unordered "slots", each of which has a cluster of properties associated with it: strict subcategorization features, selectional features, and θ -role(s). In the preceding discussion, I assumed, essentially following Chomsky (to appear), that the actual complement structure was in some sense a "projection" of the internal structure of the θ -grid. In Chapter 5, I proposed that the θ -criterion actually requires a one-to-one matching between A-positions and slots in the θ -grids, rather than between A-positions and θ -roles per se. In the context of that discussion, I assumed that the "matching" between θ -grid slots and A-positions was achieved by means of θ -role assignment, but so far I have been inexplicit about the formal mechanism by which θ -role assignment proceeds.

The formulation of Proper Government in (16) provides an essential clue in this domain. Specifically, we can assume that θ -role assignment simply consists of entering (i.e. copying) the referential index of an A-position into the appropriate slot in the θ -grid.⁹ In other words, rather than saying that a verb "assigns" a θ -role to its object in the same way that it assigns Case to the object, we can invert the logic and say that the subcategorized object "assigns" its referential index to a slot in the thematic grid within the verbal matrix. This is an intuitively appealing conception of θ -role assignment, since it does not require θ -roles to be artificially represented as distinctive features that are added to the matrix of an argument. The θ -roles never "leave" the verb's internal representation of its argument structure; rather, θ -role assignment is simply the identification of the verb's arguments by means of entering their referential indices into the thematic grid.

The major consequence of this with respect to extraction is that

phrase governs all constituents dominated by any of its projections. This special property of government -- the ability to "project" through the X-bar system -- distinguishes it from c-command, which is sensitive only to constituent structure, and ignores categorial and hierarchical labels. The structures of Case assignment and proper government are both proper subsets of the structures of government. Case assignment is dependent upon the categorial status of the governing head; proper government is dependent upon co-indexing between the head and the constituents that it governs.

There are various ways in which a head position can be co-indexed with a position that it governs. We have considered three thus far: co-indexing by virtue of θ -role assignment, co-indexing by virtue of WH-movement through an empty head position in COMP, and co-indexing by means of a special rule of the type discussed by Pesetsky (to appear). In addition, there are other means of deriving structures of co-indexing relevant to proper government. Borer (1981) discusses a construction in Modern Hebrew where a possessor NP in a noun phrase may optionally co-occur with a co-indexed clitic attached to the head noun:

- (18) a. [NP _{NP} _{house} _{the-teacher}]
 'the teacher's house'
- b. [NP [N _N _{house-her} _i] _{of} _{the-teacher} _i]
 'the teacher's house'

Normally, extraction of a possessive specifier is impossible -- as we would expect, since the head noun presumably does not assign a θ -role to the specifier.¹¹ However, Borer observes that the co-indexed clitic is sufficient to allow proper government of the possessor NP in the structure in (18b), thereby permitting extraction:

- (19) a. * [mɪ]_i še-ra'iti 'et beit [e]_i
 who that-saw-I ACC house
 'Whose did I see -- house?'
 b. [mɪ]_i še-ra'iti 'et beit-o_i [e]_i
 who that-saw-I ACC house-his
 'Whose house did I see?'

Since the clitic is part of the nominal complex, the trace in (19b) is co-indexed with the head position in \bar{N} , thus satisfying the ECP.

Apart from special circumstances of this type, however, most of the cases of proper government by a lexical head involve co-indexing by means of θ -role assignment.¹² In this regard, an interesting issue arises with respect to postposed subject arguments adjoined to VP. These fall within the domain of government of the verb, by virtue of the definition of government in (11), but the special status of the "external" θ -role that is assigned to the subject appears to have an effect on proper government. Specifically, there is considerable evidence suggesting that a postposed subject argument is not properly governed by the verbal head of the VP to which it adjoins -- at least in English.¹³ This makes sense, if the subject θ -role is not represented in the thematic grid of the verb, but rather is derived compositionally from the VP as a whole. On the other hand, Rizzi (1980) argues convincingly that the postverbal subject position is properly governed in Italian. We might reasonably attribute this difference to the fact that the Agreement element is part of the verbal matrix in Italian at the level of Logical Form, where the ECP applies. Co-indexing by Agreement would then count as still another means of deriving a structure of proper government. This raises a number of complex issues with respect to the pro-drop parameter which I will not attempt to resolve here.¹⁴

1.6 A possible problem for this account of proper government concerns

the possibility of extracting PP specifiers, which are not assigned any θ -role by the governing verb. It is well-known that (long) extraction of PP specifiers is perfectly grammatical:

- (20) a. Denny thinks [that Eric cooked dinner [in the kitchen]]
 b. Nick told me [that Ben played football [after dinner]]
- (21) a. [In which kitchen] does Denny think [that Eric cooked dinner --]?
 b. [At what time] did Nick tell you [that Ben played football--]?

The grammaticality of (21) shows that the ECP is not violated in this construction, despite the fact that the verb in the embedded clause assigns no θ -role to the adverbial PP specifier. There are several ways of interpreting this fact. Jaeggli (1980) suggests that the ECP applies only to NPs, and that PP-trace is immune to its effects. It is possible that this is correct; however, this seems somewhat dissatisfying, especially if PP-trace is subject to the Binding Theory, as observed in Chapter 4. Safir (1981) suggests that the ECP only applies to elements in chains that are co-indexed with the θ -position, thus accounting for the immunity of the adverbial trace in (21) from the effects of the ECP. Still another possible account of the grammaticality of (21) is due to Jim Huang (personal communication). Huang suggests that the grammatical extraction structures in (21) may not actually be derived from the sentences in (20), where the PP appears in postverbal position. Rather, he suggests that the adverbial PP specifier may originate in the COMP position, in which case the only PP trace in (21) would appear in COMP, thus making government by the verb of the embedded clause unnecessary.¹⁵ This is perfectly compatible with the interpretation that these structures receive, provided that we accept that the COMP position counts as a possible specifier position for S, which seems reasonable.

Although all of these proposals are compatible with the theory of proper government developed here, there is some evidence suggesting that an approach along the lines suggested by Huang is correct. The relevant evidence concerns the PP-preposing construction discussed in Chapter 4:

- (22) a. [In this bedroom]_i [_S [e]_i slept [e]_i George Washington]
 b. [Out of the house]_i [_S [e]_i marched [e]_i my friend Geoff]

Recall that the ECP forces the assumption that the PP has moved through the empty subject position prior to moving to the Topic position; this is confirmed by the *that*-trace effects observed by Bresnan (1977), and by the fact that the postverbal trace is subject to Condition (a) of the Binding Theory (i.e. the condition on anaphors). Since the subject position is not one in which adverbial specifiers may appear at D-structure, there must be a PP trace within VP in this construction -- unlike the extraction structures in (22). Since the verbs in (22) assign the θ -role of Location or Direction to these PP complements, the index of the PP-trace appears in the thematic grid of the verb, and proper government obtains. But consider the structures in (23):

- (23) a. ?*[In this dining room]_i [_S [e]_i ate [e]_i George Washington]
 b. ?*[Out in the garden]_i [_S [e]_i relaxed [e]_i my friend Geoff]

These sentences differ from their counterparts in (22) by virtue of the fact that the intransitive verbs in (23) assign no θ -role to a PP complement. Quite generally, PP-preposing is limited to verbs of motion or location; this follows immediately from the ECP, if the verb can only properly govern a PP trace with which it is co-indexed by virtue of θ -role assignment.

1.7 The preceding discussion has concentrated on showing that a co-indexing requirement can reasonably be supposed to hold for all structures of proper government, thus unifying the two core cases of proper government in terms

of a single formal property. However, the primary concern of this chapter is to study the structural status of \bar{S} with respect to the X-bar system, and to develop a deeper understanding of \bar{S} complement structures with respect to Case and θ -role assignment. In Section 2, I will provide further evidence for the status of COMP as the head of \bar{S} , leading to a clarification of the formulation of the Case Resistance Principle. In subsequent sections we will turn our attention to the status of empty categories in COMP with respect to the ECP; in particular, we shall see that ECP effects in COMP serve as a diagnostic for the status of \bar{S} complements with respect to θ -role assignment. This has a number of interesting consequences for a number of clausal complementation structures.

2. COMP as the Head of \bar{S}

2.1 In the previous section, I suggested that the c-command requirement could be removed from the definition of government -- hence, of proper government as well -- if it were assumed that the position of the complementizer in COMP is the head position of \bar{S} . A lexical complementizer governs the subject position across the S boundary, thus allowing for Case assignment to the subject position of an infinitival clause by the [-N] complementizer *for*.¹⁶ But proper government requires co-indexing with the governing head position, and this is only possible for COMP when a WH-trace in subject position is co-indexed with the head position in COMP, either by virtue of WH-movement passing through this position or by virtue of a special co-indexing rule such as the *que/qui* rule in French. When the head position in COMP is filled by a complementizer that is not co-indexed with the subject position, proper government is blocked. Obviously, the crucial assumption underlying this account is that the position of the complementizer is the head position of \bar{S} ; in this section, I provide further evidence in support

of this.

Let us first consider properties of strict subcategorization. It has long been recognized that verbs which subcategorize for clausal complements differ according to the types of clauses that they allow. Thus some verbs take only tensed clause complements, while others allow both tensed clauses and infinitives; some verbs allow either declarative or interrogative complements, while others allow just one or the other. Finally, there are various special cases, such as the limited class of verbs which require subjunctive complements in some dialects. The distinctions among the various types of complements is almost invariably reflected in the choice of the complementizer.¹⁷ Thus finite (tensed) clauses appear with the complementizer *that* or *[e]*; infinitives appear with the complementizer *for* or with no complementizer; interrogative complements appear with a WH-complementizer (e.g. *whether*) or with a WH-phrase. The distinction between tensed and infinitival clauses is also reflected in the INFL position; in addition, there are the obvious differences of meaning among the various complement types.

Bresnan (1972) proposed to account for lexical differences with respect to complement selection in terms of subcategorization for specific complementizers. Specifically, a verb might subcategorize for a *that* complementizer, or for *for*, or for *WH*. The other properties of the complement clause were supposed to be determined from this basic choice. If this approach is correct, then it constitutes evidence in favor of the status of COMP as the head of \bar{S} , since it is generally accepted that the locality of strict subcategorization allows for selection for properties of a complement phrase or of its head, but not of other constituents.¹⁸

Grimshaw (1977, 1979) has argued that many of the facts of complement

selection traditionally attributed to the choice of the complementizer should actually be captured in terms of selection for the logical function of the complement, entirely independent of strict subcategorization per se. In particular, she argues that the distinct environments for interrogative, exclamative, and declarative complements is reflected independently in "concealed" clauses appearing in NP and "null" complement structures, where no complementizer is present, suggesting that the distribution of [+WH] complementizers is not determined by subcategorization. If this is correct, then the selection of complementizers would simply be irrelevant to the issue of whether COMP is the head of \bar{S} .

The general line of Grimshaw's argument is quite plausible, although it is not obvious that all of the cases of "concealed questions" that she discusses need necessarily be treated as instances of specific selection for the logical categories of QUESTION or EXCLAMATION per se, as opposed to selection for a general category of PROPOSITION.¹⁹ If specific logical selection for subcategories of propositions is not required, then the argument against complementizer selection is less persuasive.

Quite apart from the issue of subcategorization for [+WH] complementizers, it is difficult to see how all instances of complementizer selection can be treated in terms of selection for semantic classes along the lines suggested by Grimshaw. In particular, it is not obvious that the distinctions among verbs in terms of infinitival vs. tensed clause complements are amenable to this kind of treatment, since the requisite semantic differences between the two complement types are unavailable in many instances:

- (24) a. I want very much [for John to come home]
 b. I would hate [for Valerie to leave]
 c. Roger announced [that Louise was his friend]
 d. Eric informed us [that his brother was a doctor]

- (25) a. *I want very much [that John will come home]
 b. *I would hate [that Valerie might leave]
 c. *Roger announced [(for) (Louise) to be his friend]
 d. *Eric informed us [(for) (his brother) to be a doctor]

These verbs contrast with others where both tensed clauses and infinitives are possible, with no obvious difference in meaning:

- (26) a. John is hoping [that he will be able to visit us]
 b. Nick showed [that the solution was very simple]
- (27) a. John_i is hoping [PRO_i to be able to visit us]
 b. Nick showed [the solution to be very simple]

Although it seems that infinitival complements are sometimes excluded on semantic grounds (e.g. in the case of the "factive" verbs discussed by Kiparsky and Kiparsky 1968), such an explanation is not available to distinguish the verbs on (25) from those of (26-27), suggesting that subcategorization is probably involved.²⁰

2.2 There is evidence from Case assignment which also suggests that COMP is the head of \bar{S} ; this is rather more straightforward than the facts associated with subcategorization. Recall that the Case Resistance Principle prevents \bar{S} from being assigned Case. When \bar{S} functions as an argument, it must move to a non-A-position, and bind its trace in the Case-marked A-position as a variable. This accounts for the fact that \bar{S} may never appear in the true subject position of a clause at S-structure; similarly, a tensed clause object must move out of the true object position adjacent to the verb prior to the assignment of Case at S-structure. In addition, it seems that the CRP provides an explanation for the fact that prepositions may not take \bar{S} complements: the preposition must assign Case to its [IN] complement, and the strategy of moving to a non-A-position appears to be

unavailable for the object of a preposition. (I will discuss the reasons for this in some detail in Chapter 7.²¹)

In Chapter 3, I observed that the status of \bar{S} -trace raises an interesting issue with respect to the exact status of the CRP. Specifically, it is not obvious why the CRP does not rule out Case assignment to the trace of \bar{S} in the same way that it rules out Case assignment to \bar{S} itself. I mentioned two possible explanations for this. First, we might assume that the trace of *Move α* is not specified for categorial features, in which case the [+Tense] feature would not be present to block Case assignment to the trace of an \bar{S} complement at S-structure. (Of course the [+Tense] feature would be present at D-structure to satisfy strict subcategorization requirements.) The second possible approach would be to assume that the CRP does not apply to the S complement as a whole, but rather to its head, analogous to the original formulation of the Case Filter in Chomsky (1980). According to this account, the CRP would not rule out Case assignment to \bar{S} -trace, even if it is categorially specified as [+Tense], since the trace does not contain an internal lexical head.²² As it turns out, there is evidence from embedded interrogative constructions favoring the second of these alternatives, simultaneously supporting the view that COMP is the head of \bar{S} .

Although tensed clauses may not normally appear in a position of Case assignment at S-structure, this is simply not true for interrogative clauses which contain a WH-phrase in COMP:²³

- (28) a. [Although [what you did to her] shocked me], ...
 b. We were talking [about [who we should help]]
 c. I consider [[who you decide to work with] to be unimportant]
 d. John explained [why the sky is blue] to his children

- (29) a. *[Although [(that) you abandoned her] shocked me], ...
 b. *We were talking [about [(that) we should help them]]
 c. *I consider [[that you work with Roger] to be unimportant]
 d. *John explained [[that the sky is blue] to his children]

In this respect, the embedded interrogatives behave as though they were NPs. But this does not imply that they have the categorial status of NP; in fact, these clauses appear with verbs that subcategorize for \bar{S} complements and do not allow "concealed question" NPs of the type discussed by Grimshaw:

- (30) a. I wonder [who Francine plans to visit]
 b. We inquired [what time it was]
- (31) a. *I wonder [the person she plans to visit]
 b. *We inquired [the time]

The contrast between (28) and (29) shows that the CRP is sensitive to the categorial status of the element present in COMP. This makes sense if (i) the CRP actually applies to the lexical head of a phrase, rather than to the phrase as a whole, and (ii) COMP is the head of \bar{S} . Suppose that the tensed clause complementizers *that* and *[e]* have the categorial status of \bar{S} , and in particular bear the feature [+Tense]. Then the CRP prevents the assignment of Case to a clause headed by either of these complementizers. Similar remarks obtain for the infinitival complementizer *for*, by virtue of its [-N] feature. But in the interrogative clauses in (28), WH-movement has placed an NP in the head position of \bar{S} . NP does not bear either of the Case-assigning features, so the Case assigned to \bar{S} can "percolate" to the head of the clause without violating the CRP.²⁴

This special strategy of assigning Case to \bar{S} is only possible when the COMP position contains a phrase that is eligible to bear Case in conformance with the CRP, and is not a general property of all interrogative clauses. Specifically, in Pied Piping constructions where a PP appears

in COMP, Case assignment to S is blocked, since the Case cannot percolate to the PP in COMP without violating the CRP:

- (32) a. *[Although [in which city you live] surprised me], ...
 b. *We were talking [about [with whome we would go camping]]
 c. *I consider [[with whom you work] to be unimportant]
 d. *John explained [in which countries he had fought] to his children

Thus the refined version of the CRP explains in rather simple terms the precise range of deviations displayed by embedded interrogatives with respect to the normal positions of \bar{S} arguments -- provided we accept that the Case assigned to \bar{S} percolates to the head position in COMP. These facts cannot be simply attributed to \bar{S} -deletion, since this rule is blocked when COMP is lexically filled.²⁵

2.3 Embedded interrogative S complements are not the only examples of Case assignment into COMP. Kayne (1980) points out that extraction from the subject position of a clause is only possible if the clause appears in a position of Case assignment:

- (33) a. * The only person who it's not essential [-- talk to her] is Bill
 b. * Who is it likely [-- will forget the beer] ?
 c. ??Who does it appear [-- likes Bill] ?

Extraction from these clauses is not generally ill-formed, however, as

Kayne notes:

- (34) a. The only person who it's not essential [she talk to --] is Bill
 b. What is it likely [Max will forget to bring --] ?
 c. Who does it appear [Bill likes --] ?

Moreover, when a tensed clause appears as a complement of a verb which can assign Case, extraction from subject position is fine, as in (5) above.

Borer (to appear) proposes that trace in COMP may only count as a

proper governor if it bears Case; then the contrast between (33) and (5) would reduce to an ECP violation in the case of extraction from subject position when the trace in COMP bears no Case. We might interpret this in the following terms. Condition (ii) in (16) requires that the governing head position have lexical content in order for proper government to hold. Suppose now that trace has no lexical content unless it bears Case, as proposed by Jaeggli (1980b). It then follows that Case must be assigned to WH-trace in COMP if it is to serve as a proper governor for the subject position.²⁶

One might be tempted to discount the claim that Case-marking into COMP is crucial in ruling out the examples in (33), perhaps by appealing to some other property of the adjectives and Raising verbs.²⁷ But there is further evidence which tends to support Kayne's hypothesis that Case assignment into COMP is the crucial factor in these examples. Recall that Case assignment observes a strict adjacency condition; this means that if some other phrase intervenes between the complement clause and the governing verb, Case assignment into COMP should be blocked. This in turn predicts that subject extraction should be impossible if the clause is not adjacent to the governing verb -- even if the verb is one of the "bridge" verbs that normally allows extraction from subject position. This prediction appears to be borne out:

- (35) a. Who did John say [-- would help his mother] ?
 b. Which solution did Carol prove [-- was correct] ?
- (36) a. ?*Who did John say [to his mother] [-- would help her] ?
 b. ?*Which solution did Carol prove [beyond a doubt] [-- was correct] ?

Although the judgments are not as crystal-clear as one might like, they do strongly favor extraction from a position adjacent to the verb, as Kayne's

account of subject extraction would predict.

3. COMP and the ECP

3.1 As Kayne (1981) observes, interesting questions arise with respect to the status of empty categories in COMP vis a vis the ECP. Consider first the status of the empty element that may appear at S-structure in the complementizer position of a tensed clause. Perhaps, as suggested by Den Besten (1978), this represents the trace of the tense features which appear in COMP at D-structure. Alternatively, this may be an empty position at D-structure and S-structure, reserved for the Tense operator at the level of Logical Form, as I proposed in Chapter 1. In either case, the distribution of this empty complementizer strongly suggests an ECP account, as noted by Kayne:

- (37) a. Ben knew [\bar{S} [e] [the teacher was lying]]
 b. Louise announced [\bar{S} [e] [she was angry at me]]
 c. It appears [\bar{S} [e] [we will have to do this alone]]
- (38) a. [\bar{S} That the teacher was lying] was hardly obvious.
 b. [\bar{S} That Louise was angry at me] came as no surprise
- (39) a. * $[\bar{S}$ [e] [The teacher was lying]] was hardly obvious
 b. * $[\bar{S}$ [e] [Louise was angry at me]] came as no surprise

The distribution of the empty complementizer shows the subject/object asymmetry characteristic of the ECP; only when the clause appears in object position can its COMP be properly governed. This makes perfect sense if COMP is the head of \bar{S} ; wherever \bar{S} is governed, its head position is too. The ill-formedness of (39) suggests that the ECP applies to the head position of an argument, even if the phrase as a whole contains lexical material that is not in the head position; this supports the conclusion of Belletti and Rizzi (1980) that the ECP applies to the head position in NP.²⁸

The ECP effect evident in (39) is not limited to subject \bar{S} ; the same facts hold for object \bar{S} complements that appear in Topic position at S-structure:

- (40) a. *[[e] [The teacher was lying]]_i Ben already knew [e]_i
 b. *[[e] [She was angry at me]]_i Louise forgot to mention [e]_i
- (41) a. That the teacher was lying, Ben already knew
 b. That she was angry at me, Louise forgot to mention

Nor is the ECP effect limited to S-initial position, as one might expect if these facts were due to some sort of processing problem. Observe:

- (42) a. *Itⁱ surprises me [[e] [you have heard about Roger]]ⁱ
 b. *Itⁱ came as a relief [[e] [my mother was safe]]ⁱ
- (43) a. It surprises me that you have heard about Roger
 b. It came as a relief that my mother was safe

Recall that the postverbal subject adjoined to VP is not properly governed in English, presumably because of the special status of the subject with respect to θ -role assignment.²⁹ Since the index of the postposed subject in (42) does not appear in the thematic grid of the governing verb, proper government does not hold, and the ECP is violated with respect to the head position of the clause in COMP. This is responsible for the distinction between these postverbal clauses and their subcategorized counterparts in (37).

The status of tensed clause complements to derived nominals provides further support for this account. Recall from Chapter 3 that derived nominals do not actually assign a θ -role to their tensed clause complements; instead, they are in apposition with them. This means that neither \bar{S} nor its head is co-indexed with the governing derived nominal head; therefore proper government does not hold, and the ECP rules out the possibility of an empty head position in COMP:

- (44) a. *I distrust [the claim [\bar{S} [e] [Bill had left the party]]
 b. *[John's belief [\bar{S} [e] [he would win the race]]] was misguided
- (45) a. I distrust the claim that Bill had left the party
 b. John's belief that he would win the race was misguided

Thus the lack of a "that-Deletion" structure within derived nominals follows without any additional assumptions.³⁰

3.2 The story with the complements to the "non-bridge verbs is somewhat more complex. As observed by Erteschik (1973), the *that* complementizer is obligatory with the "manner-of-speaking" verbs studied by Zwicky (1971):

- (46) a. *Bill muttered [[e] [Denny was playing too much poker]]
 b. *Ben sighed [[e] [he was sick of not getting fed]]
 c. *Francine whispered [[e] [we should turn down the stereo]]
- (47) a. Bill muttered that Denny was playing too much poker
 b. Ben sighed that he was sick of not getting fed
 c. Francine whispered that we should turn down the stereo

As Kayne (1981) observes, this again suggests an ECP account. In terms of the theory of proper government developed here, however, these structures appear to pose a problem. The tensed clause complements in (46) appear in VP; certainly there is no obvious evidence presented to the child to suggest otherwise. Moreover, in the theory developed in this chapter, the COMP position is the head of \bar{S} . From this it follows that if \bar{S} is properly governed, then its COMP is governed automatically, without any need for a special rule such as \bar{S} -deletion to apply. Hence the ungrammaticality of (46) implies that \bar{S} is not properly governed in these structures. But according to the theory of θ -role assignment developed in Section 1.4, a verb is co-indexed with any complement to which it assigns a θ -role. Thus if the manner-of-speaking verbs in (47) assign a θ -role to their

clausal complements, proper government should hold, since all of the conditions in (16) are satisfied. Therefore either one of our assumptions is incorrect, or else the verbs in (47) do not actually assign θ -roles to their complements. Surprising as this may sound, it seems that the latter conclusion is correct.

It has often been observed that the clausal complements to the manner-of-speaking verbs do not undergo syntactic movement rules.³¹ Specifically, WH-movement and NP-movement in passive structures are both ruled out:

- (48) a. *[That Denny was playing too much poker], which Bill muttered --, ...
 b. *[That he was sick of not getting fed], I think that Ben sighed --
- (49) a. *[That Denny was playing too much poker] was muttered -- by Bill
 b. *[That we should turn down the stereo] was whispered -- by Francine

There are two possible explanations for this, either of which implies that the verbs in these structures do not directly assign a θ -role to their clausal "complements". First, an obvious possibility is that the verbs do not properly govern the trace of \bar{S} in these constructions. The ill-formedness of (48, 49) then simply reflects the same phenomenon as (46). In our terms, the failure of proper government must mean that the indices of the complements do not appear in the θ -grids of the governing verbs.

An alternative account of (48, 49) leads to the same conclusion. Recall from our discussion of infinitival complements in Chapter 3 that Topicalization of a clausal complement is only possible if the verb assigns Case to the position occupied by clause at D-structure. (This follows from the fact that the variable bound by the Topic must bear Case in order for θ -role assignment to be possible.) Similar remarks obtain with respect to Passivization: since passive morphology absorbs Case features, a passive participle can only appear in a complement structure if the corresponding

verb assigns Case to a complement in the same structure. If the manner-of-speaking verbs do not assign Case to their clausal complements, then the failure of Passivization and Topicalization in (48, 49) is directly parallel to that observed in infinitival complement structures. There is one crucial difference between the two complement types, however: infinitival clauses intrinsically satisfy the "visibility" condition on θ -role assignment, making Case assignment by the governing verb unnecessary. But tensed clauses are dependent upon Case assignment in order for θ -role assignment to proceed; therefore if no Case is assigned by the governing verb to the trace of the tensed clause complement in (47), we must conclude that the manner-of-speaking verbs do not assign θ -roles to their clausal complements.

In fact there is further evidence supporting the hypothesis that the complement structures in (47) fall outside the realm of the core theory of θ -role assignment. Recall from Chapter 3 that when a PP complement follows the trace of an extraposed direct object argument, preposition stranding via WH-movement or Topicalization is impossible. (This holds true in Focus NP shift constructions as well as with extraposed tensed clause complements. Significantly, however, when a tensed clause appears as the complement of a manner-of-speaking verb, preposition stranding in VP is grammatical:³²

- (50) a. Ben sighed to Mary that he was sick of not getting fed
 b. Francine whispered to Nick that we should turn down the stereo
- (51) a. It was Mary that Ben sighed to -- that he was sick of not getting fed
 b. Who did Francine whisper to -- that we should turn down the stereo?

This shows that the tensed clause complement in this structure does not appear in a non-A-position, binding a trace to which Case must be assigned. Hence these structures do not involve θ -role assignment to A-chains.

The special status of the manner-of-speaking verbs with respect to θ -role assignment is also reflected in the related nominal constructions. Recall that a derived nominal normally adopts the same strict subcategorization frame as the verb to which it is related. This is impossible in the case of verbs which assign a θ -role to a tensed clause complement, however, for reasons outlined in Chapter 3. The derived nominals based on these verbs instead denote the direct object argument of the verb, and therefore stand in apposition to their clausal "complements". If the clausal complements of the manner-of-speaking verbs were really direct object arguments, then we would expect this strategy to be available for these derived nominals, too. In fact, however, this is not the case:

- (52) a. *[Bill's shout that I should get out of the way] surprised me
 b. *[Ben's sigh that he was sick of not getting fed] was touching
 c. *[Francine's whisper that we should turn down the stereo]...

(52) shows that the derived nominals *whisper*, *sigh* and *shout*, like the other nominals based on the manner-of-speaking verbs, do not refer to the clausal complements of their related verbs. They refer to the physical noise produced by the act of speaking, rather than to the propositional content of the message:

- (53) a. Bill's shout was very loud
 b. Ben's sigh was touching to hear
 c. Francine's whisper was barely audible

The fact that the structure in (52) is unavailable supports the view that the clausal "complements" to these verbs are not their true thematic objects. The ungrammaticality of the empty complementizer position in (46) thus turns out to be perfectly compatible with the theory of θ -role assignment and proper government developed above, despite superficial appearances.

Of course, the "superficial appearances" can't be ignored entirely. In some sense, the clausal complement of a non-bridge verb is interpreted as something very close to a direct object. It is probably appropriate to view these as clausal adjuncts that are linked by a special interpretive rule to the object position in the verb's θ -grid. As Kayne (1981) observes, there are very natural paraphrases for these sentences which are suggestive of this adjunct interpretation, for example: *Bill muttered to the effect that ...* or *Francine whispered to the effect that ...*; this is never possible for true bridge verbs. I will not attempt to formalize the relevant interpretive rule here.

It is perhaps worthwhile to step back for a moment from the maze of grammaticality judgments associated with these verbs and consider their special thematic properties from the perspective of the theory of acquisition. Formally speaking, the syntactic configurations in (47) are indistinguishable from those in which the bridge verbs appear. All of the evidence concerning the special status of the nonbridge verbs that we have considered has been negative evidence of the type that the child presumably does not have access to. What, then constitutes the cue that informs the acquisition device that these verbs are incapable of assigning a θ -role to their object complements? The fact that these verbs form a natural semantic class suggests that the relevant evidence comes directly from their status as manner-of-speaking verbs per se.

Suppose that the theory of grammar provides a set of "core" grammatical meanings that must be represented in the vocabulary of every language.³³ Among these core meanings is that of speech. Each language, however, will show a rich diversity of special vocabulary elaborating in one way or another upon the core vocabulary. Suppose now that the special meanings

associated with the "specialized" verbs are directly related to the thematic roles that they assign. In the case of the manner-of-speaking verbs, the specialized meanings take the form of explicit specifications of the nature of the thematic objects of these verbs -- the physical properties of the speech signal. This has the effect of "freezing" the thematic structure of the verb so that the direct object argument must denote the speech signal itself, and cannot denote a proposition.³⁴ Since clauses are always represented as propositions at the level of Logical Form, the child is able to deduce that a clausal complement of a manner-of-speaking verb cannot be the true thematic object of the verb, by virtue of learning no more than the basic meaning of the verb itself.

Of course this scenario applies just to the manner-of-speaking verbs. In many cases, the special meaning of the verb of speech provides clear evidence that the true thematic object of the verb is in fact propositional; *persuade*, *inform*, and *advise* are presumably examples of this type. Many of these verbs are also "non-bridge" verbs in terms of their formal grammatical properties with respect to θ -role assignment and the ECP. Obviously, some other account must be provided for the chain of deduction pursued by the language faculty in determining the properties of these verbs. The crucial point, however, is that the term "non-bridge" verb has traditionally been used to refer to a group of verbs that do not constitute a true natural class, and there is no reason to suppose that the child makes use of the same pattern of evidence in deducing the "non-bridge" properties for every case. This point will become clearer in Section 4, where we shall see that an entirely different deductive strategy leads to the same formal result.

3.3 Erteschik (1973) observes that there is a strong correlation between the possibility of WH-extraction from a clause and the possibility of a [e] complementizer:

- (54) a. Ben knew [[e] [the teacher was lying]]
 b. [Who]_i did Ben know [[e]_i [[e]_i was lying]] ?
- (55) a. *Itⁱ came as a relief [[e] [my mother was safe]]ⁱ
 b. *[Who]_j did itⁱ come as a relief [[e]_j [[e]_j was safe]]ⁱ ?
- (56) a. *Bill muttered [[e] [Denny was playing too much poker]]
 b. *[Who]_i did Bill mutter [[e]_i [[e]_i was playing too much poker]] ?

Erteschik suggests that both phenomena are controlled by a functional principle relating to assertive force, which she terms "dominance". The basic idea runs as follows. Clausal complement structures differ according to the discourse function that they serve. In most cases, the main assertion of the sentence is conveyed by the material in the main clause. In some cases, however, the material in a complement clause constitutes the major assertion of the sentence; in such cases, the complement clause is said to be dominant. Erteschik suggests that extraction is only possible out of a dominant clause; for this reason, if the main clause contains too much information, then it is dominant and blocks extraction. The bridge verbs are those which are not semantically dominant, and therefore allow extraction out of their complements; the non-bridge verbs (including the manner-of-speaking verbs) are intrinsically dominant and block extraction. The correlation with the possibility of an empty complementizer in the complement clause follows from the assumption that the lexical complementizer can only be omitted if the complement is dominant. Intuitively, the latter observation makes sense, since the complementizer need never appear in a main clause; thus we might view the phenomenon of "that-deletion" in terms of a dominant

subordinate clause "masquerading" as a main clause.

In the following discussion, we shall see that a large part of the correlation observed by Erteschik actually follows from the ECP; in those cases where the ECP is inapplicable, the correlation turns out not to hold. Nevertheless, there are a few questionable cases for which we will be led to invoke her notion of dominance so as to classify certain grammatical sentences as functionally "strange".

Consider first the grammatical sentences in (54). In (54a), the empty complementizer is properly governed by the matrix verb, since it is the head position of the clause to which the verb assigns the direct object θ -role. In (54b), the trace in subject position is properly governed by the trace in the head position in COMP. The trace in COMP is in turn properly governed by the matrix verb, by virtue of appearing in the head position of the clause.

At first glance, proper government of the trace in COMP appears to be directly parallel to proper government of the empty complementizer in (54a). There is an interesting difference, however. In order for the verb to properly govern the trace, we must assume that it is the index of the WH-trace that is entered in the object slot of the governing verb! In other words, the WH-phrase in COMP supplies the index for the clausal complement as a whole:

(57) [who]_i did Ben [_V know [_S [e]_i [_S [e]_i was lying]]]]
[OBJ-e]_i

Clearly, this is a surprising consequence, but it turns out not to be problematic. At LF, the clausal complement appears as a proposition. In order for the traces which it contains to be properly governed, it must appear as a subcategorized complement in \bar{V} . Therefore it can only appear

with a verb that assigns a θ -role to a propositional argument. Although the clause shares its referential index with the WH-phrase, this causes no ambiguity at LF: the verb interprets the r -index as the identifying index of the clausal complement to which it assigns the θ -role of propositional object. Similarly, the WH-phrase in COMP "seeks out" the variable with which it is co-indexed. Technically, the clause as a whole is bound by the WH-phrase in the COMP of the main clause, but it cannot be construed as a variable, by virtue of its clausal structure. Thus the "double binding" is superfluous, but harmless.

Now consider the ungrammatical examples in (55) and (56). We have already discussed the (a) sentences of each pair; these are ruled out because the governing head does not assign a θ -role directly to the clause of which the empty COMP position is the head. Much the same story applies to the (b) sentences. In each case, the trace in the subject position of the clause must be properly governed by the trace in the head position in COMP. But the trace in COMP violates the ECP, since there is no external governor with which it can be co-indexed.

So far, our formal account of these facts is empirically equivalent to Erteschik's account stated in terms of semantic dominance. The stories differ, however, in the case of extraction from the object position of a complement clause:

- (58) a. $[\text{Who}]_1$ does it surprise you $[\bar{S}$ that [John likes $[e]_1$]] ?
 b. $[\text{What}]_1$ did it come as a relief $[\bar{S}$ that [Bill bought $[e]$]] ?
- (59) a. $[\text{What}]_1$ did John just whisper to you $[\bar{S}$ that [he ate $[e]_1$]] ?
 b. $[\text{Who}]_1$ did Bill mutter $[\bar{S}$ that [he doesn't like $[e]_1$]] ?

In terms of a theory which regulates the extraction possibilities in terms of the semantic dominance of the complement clause, there is no reason to expect a distinction between extraction from subject position and extraction

from object position. But this is just what we expect under an ECP account. The object traces in (58) and (59) are properly governed within V, so there is no need for a trace to appear in COMP at LF, as far as the ECP is concerned.

On the other hand, the Subjacency condition on *Move α* does require that the WH-phrase move successive-cyclically through the COMP position of the complement clause. Why is the trace in COMP immune to ECP effects at LF? We can account for this in the following terms.³⁵ Suppose that all rules mapping from S-structure to LF are optional, subject only to general constraints such as the Projection Principle. In the case of extraction from subject position, the ECP requires that WH-trace appear in COMP in (54-56). Since this trace must appear at the level relevant to the ECP, it will itself be subject to the principle. But in the object extraction cases, nothing forces the trace left in COMP by successive-cyclic movement to be mapped to LF. The trace does not appear in A-position, and is not selected as a lexical property by the governing verb. Although it must appear in the S-structure representation by virtue of the Subjacency condition on *Move α* , it need not appear at LF; indeed, it must not -- if the ECP is to be satisfied.³⁶

Note that the subject/object asymmetry breaks down in the case of extraction from a subject clause:

- (60) a. *[What]₁ did [_S (that) [John ate [e]₁]] annoy you ?
 b. *[Who]₁ did [_S (that) [[e]₁ ate the caviar]] annoy you?

Although the subject extraction structure in (60) can be interpreted as an ECP violation, this is not possible for the object extraction, in the theory assumed here. Notice, however, that (60a) is ruled out on independent grounds: the Case Resistance Principle requires that the clausal "subject" appear in

Topic position, as we saw in Chapter 3. But extraction from Topic position is impossible; therefore (60a) represents either a CRP violation or an illegitimate extraction, and there is no need to invoke the ECP.³⁷

Before concluding this discussion, it is perhaps worth commenting briefly on the dual status of the COMP position. On one hand, this position appears to behave as the head of the A-position occupied by the clause, to which a θ -role is assigned. On the other hand, it functions as a phrasal non-A-position with respect to arguments within the clause. This dual function is not really contradictory; it simply requires that we conceive of the definition of non-A-position in relational rather than absolute terms. Let us say that COMP is a non-A-position with respect to the constituents that it c-commands; but with respect to the matrix clause in which an \bar{S} complement appears, COMP is simply the head of the clause. Note that if Subjacency is a condition on movement rather than on representations derived by movement, then we can assume that the index of COMP counts exclusively as the index of the clause with respect to the matrix. In other words, the only phrasal positions within \bar{S} that are accessible to principles operating in the matrix are its A-positions, which are subject to the Binding Theory.

4. Apparent Violations of the Adjacency Condition

4.1 Recall that when a verb assigns a θ -role to a tensed clause complement, the clause must move to a non-A-position, leaving a trace adjacent to the verb to which Case and θ -role can be assigned. When a PP also occurs in \bar{V} , the stranding facts suggest that the trace of the clause must appear immediately next to the verb, as the adjacency condition on Case assignment requires. In some cases, however, a clausal object co-occurs in VP with a direct object NP, as in (61):

- (61) a. Kevin persuaded [Roger] [that his hamburgers were worth buying]
 b. Carol convinced [Dan] [that she didn't want a cat]
 c. Jim advised [his parents] [that they should move to Canada]
 d. Eric reminded [the teacher] [that tigers are dangerous]

In terms of the framework of assumptions in Chapter 3, all of these sentences are potential counterexamples to the adjacency condition on Case assignment. In each case, there are two object arguments in VP, both of which ought to be dependent upon the governing verb in order for Case assignment to proceed. Regardless of which order the complements appear in at D-structure, the adjacency condition cannot be satisfied by both objects simultaneously. Nevertheless, these sentences are perfectly grammatical.

Perhaps a natural conclusion to draw, in the light of the discussion in the preceding section, is that the clausal "objects" in these structures are not really assigned a θ -role by the governing verb, making Case assignment to the trace of the clause unnecessary. These structures would then be equivalent in their grammatical properties to the complements of the manner-of-speaking verbs; in this case, the cue that informs the child would be the apparent adjacency violation rather than the meaning of the verb per se. As it turns out, the evidence is somewhat contradictory.

First of all, Topicalization is impossible, implying either that the verb does not properly govern the \bar{S} -trace, or alternatively that it does not assign Case to the Trace:

- (62) a. *[That his hamburgers were worth buying], Kevin persuaded Roger --
 b. *[That tigers are dangerous], Eric reminded the teacher --

This is perfectly compatible with the assumption that the verb assigns no θ -role directly to the complement clause, suggesting that the clause is linked to the thematic structure of the verb by the same interpretive rule that

applies to the complements of the manner-of-speaking verbs.³⁸ Moreover, extraction from subject position of the complement is also blocked, despite the fact that extraction from object position is fine:

- (63) a. *[Who]_i did Carol convince Dan [_S [e]_i [[e]_i didn't want a cat]] ?
 b. *[Who]_i did Jim advise his parents [_S [e]_i [[e]_i should move to Canada]] ?
- (64) a. [What]_i did Carol convince Dan [that she didn't want [e]_i] ?
 b. [Where]_i did Jim advise his parents [that they should move to [e]_i] ?

This again suggests an ECP effect with respect to the trace in COMP, as we would expect, if the verb does not assign a θ -role to the clause.

But other evidence suggests that the verb does assign a θ -role to the complement. First of all, the complementizer position can be occupied by an empty element (provided it is not the trace of a WH-phrase extracted from subject position):

- (65) a. Kevin persuaded Roger [[e] [his hamburgers were worth trying]]
 b. Carol convinced Dan [[e] [she didn't want a cat]]
 c. Jim advised his parents [[e] [they should move to Canada]]
 d. ?Eric reminded the teacher [[e] [tigers are dangerous]]

Although judgments are delicate, it seems that the sentences in (65) are considerably better than their counterparts with the manner-of-speaking verbs. Another fact suggesting that θ -role assignment may be involved here is that the complements can all be replaced by NPs with propositional content, provided that the verb lexically triggers *of*-Insertion, analogous to the Italian infinitival complement structures where *di*-Insertion applies in VP:

- (66) a. Kevin persuaded Roger *of*-[the value of his hamburgers]
 b. Carol convinced Dan *of*-[her lack of interest in a car]
 c. Jim advised his parents *of*-[the value of moving to Canada]
 d. Eric reminded the teacher *of*-[the danger posed by tigers]

This is uniformly impossible with the manner-of-speaking verbs:

- (67) a. *Ben sighed (to Mary) of-[his impatience with not getting fed]
 b. *Francine whispered (to Nick) of-[the need to turn down the stereo]

The ungrammaticality of the examples in (67) follows from the fact that the manner-of-speaking verbs are unable to assign a θ -role to a propositional complement of any kind; evidently, this is not true for the NP complements in (66).

Note that *of*-Insertion is required in (66) so that the second object can satisfy the visibility condition on θ -role assignment; *of*-Insertion thus functions as a saving device in an environment where the adjacency condition prevents the verb from assigning Case. Suppose that we take the grammaticality of the "*that*-Deletion" structures in (65) to indicate that the verb somehow assigns to the \bar{S} complement the same θ -role that it assigns to the second NP in (66). We would then have to find answers to two questions: first, how is θ -role assignment possible, given the adjacency requirement on Case assignment and the visibility requirement on θ -role assignment; second, what is responsible for the apparent ECP effects in (62) and (63)?

Let us first consider the problem of θ -role assignment. The verbs belonging to the class exemplified in (61-66) all share a peculiar property. Although they are verbs of speech, they are more than that: they all convey a special meaning associated with the direct object argument's knowledge of the propositional content of the complement clause. Thus when Kevin persuades Roger that his hamburgers are worth buying, he does more than just say something; he brings about a belief on Roger's part that what he is saying is true. Similar remarks obtain with respect to Carol convincing Dan about the cat. When Jim advises his parents that they should move to Canada, he provides them with knowledge that they can make use of; when

Eric reminds the teacher that tigers are dangerous, he brings to the teacher's attention knowledge that he was previously aware of.

This is reminiscent of the [+R] adjectives discussed in Section 7.2 of Chapter 3, and suggests that the verbs in this class share that abstract feature. This means that all of these verbs ought to be able to assign a θ -role to their clausal complements by means of the special rule of θ -role assignment by Recognition. Recall that this rule does not depend on Case assignment, since it can apply freely in NP and AP; this explains the apparent adjacency violations in (61). Moreover, the rule can only apply to a clausal complement, explaining the need for *of*-Insertion in (66) and (68):

- (68) a. John is [_{AP} aware [_S [e] [he has to eat well]]]
 b. Valerie was [_{AP} confident [_S [e] [her sister would succeed]]]

So far, so good.

Let us now return to consider the facts which suggested that the complements of the [+R] verbs are not properly governed. It turns out that these can be attributed to the fact that the verbs do not assign Case to the complement. The fact that Topicalization is impossible in (62) follows immediately from the fact that the \bar{S} -trace is not assigned Case; the visibility condition prevents normal θ -role assignment to an A-chain. Moreover, the rule of θ -role assignment by Recognition is inapplicable in this structure, since it only applies to a clause appearing as a complement of the governing head at S-structure.³⁹ Now consider the ungrammatical subject extraction examples in (63); these also turn out to follow from the lack of Case assignment. Although the trace in COMP is properly governed -- like the empty complementizer in (65) -- it is not assigned Case, and therefore is unable to count as a proper governor for the subject trace, exactly parallel to the examples in (33) and (36) discussed previously.

Thus the apparent adjacency violations in (61) turn out to tie in with a class of superficially unrelated adjectival complement structures in an interesting way. Moreover, the pattern of grammaticality facts is exactly what we expect, given the interaction of the various rules and principles involved.

4.2 Let us turn our attention to another class of superficial adjacency violations:

- (70) a. John asked [his mother] [what she wanted him to do]
 b. Louise told [me] [that Denny was mean to her]
 c. Roger tried to show [his students] [that glass is a liquid]

These clausal complement structures differ in certain respects from those discussed in the previous section. First of all, Topicalization is possible, at least for the non-WH complements:

- (71) a. [That Denny was mean to her], Louise has told me -- already
 b. [That glass is a liquid], Roger tried to show his students --

Second, extraction from subject position is possible:

- (72) a. [Who]_i did Louise tell you [_S [e]_i [[e]_i was mean to her]]?
 b. [What]_i did Roger try to show his students [_S [e]_i [[e]_i is a liquid]]?

As we might expect, given (72), these structures also allow the empty complementizer, just like the [+R] verbs:

- (73) a. Louise told me [[e] Denny was mean to her]
 b. Roger tried to show his students [[e] glass is a liquid]

So what's going on here? The answer turns out to be remarkably simple: all of these verbs belong to the monosyllabic Native stem class that is subject to the word-formation rule of NP-Incorporation -- the same

rule that is responsible for deriving the Double Object and Particle-Movement constructions discussed in Chapter 5. This means that the verb really does assign Case to the trace of the \bar{S} complements in (70), explaining the apparent adjacency violation:

(74) Louise [[\bar{V} [V told - me] [e]_i [that Denny was mean to her]_i]

Topicalization is possible in (72) for the same reason: the trace of \bar{S} appears adjacent to the complex verb, thus making Case assignment -- hence, θ -role assignment -- possible. Much the same story applies to the subject extraction cases in (72): the verb is able to assign Case to the WH-trace in COMP, permitting it to function as a proper governor for the trace in the subject position of the complement.

As this analysis predicts, WH-extraction of the incorporated indirect object NP is impossible, at least when the verb clearly must be assigning Case to the COMP position of the clausal complement:⁴⁰

- (75) a. ?*[Who]_i did Louise tell [e]_i [[e] Denny was mean to her]?
- b. ?*[Which students]_i did Roger try to show [[e] glass is a liquid]]?

The status of these examples is exactly parallel to the ungrammatical (but semi-acceptable) cases of extraction from the first NP position in the Double Object construction that were discussed in Chapter 5.

Thus it seems that the diagnostics for proper government of tensed clause complements and Case assignment into COMP make exactly the right range of predictions, even in structures where they appear to be contradicted by the superficial arrangement of data.

5. Infinitival Complement Structures

5.1 In the preceding discussion, I have concentrated entirely on the properties of tensed clause complements with respect to θ -role assignment and

proper government. In this section, I will provide a brief account of infinitival complements, which differ in certain respects from their tensed clause counterparts.

Let us first turn our attention to the status of the COMP position of the infinitival clause with respect to the ECP. We have seen that when a tensed clause appears without a lexical complementizer, the clause must appear in a position of proper government, suggesting that some principle of grammar forces the clause to contain an internal COMP position. (The ECP effects then follow when this position is left unfilled.) In Chapter 1, I suggested that this could be interpreted as a requirement imposed by the Tense operator, such that there must be a position reserved for the operator to take scope over the clause at LF.⁴¹ Significantly, however, this does not seem to be true for infinitival clauses. Although the complementizer *for* must appear if the clause contains a lexical NP subject -- for reasons having to do with Case assignment -- no such requirement holds when the clause contains a PRO subject, even when it appears in a position that is not properly governed:

- (76) a. [To kill animals] is wrong
 b. Itⁱ was wonderful [to be released from jail]ⁱ

In our terms, this must mean that infinitival clauses, unlike tensed clauses, do not require a COMP position to be generated; at least, this position need not appear at LF, where the ECP applies. (If these clauses did require a COMP position, then the ECP ought to rule out (76) by virtue of the absence of a lexical complementizer.) In fact, this conclusion should come as no great surprise, since it is very common for languages to lack infinitival complementizers entirely, even if they differ from English in always requiring a lexical complementizer in a tensed clause.

We might now ask why this should be so. It seems that the answer lies in the fact that infinitival clauses do not always contain a Tense operator. In Chapter 1, I observed that infinitival complements differ significantly from gerund complements in having the meaning of an "Unrealized" (quasi-future) tense; I further suggested that this difference between the two clause-types was responsible for the fact that gerunds never contain a COMP position. Suppose that there is a biuniqueness requirement holding between the presence of a COMP position and the occurrence of a Tense operator in a clause; the presence or absence of either one would then serve as a diagnostic for the presence or absence of the other. This hypothesis is confirmed by the fact that infinitival relative clauses -- which require a COMP position because of WH-movement -- always have an Unrealized tense, as is reflected in their purposive interpretation.

In this light consider the infinitival subject clauses in (76). The absence of ECP effects implies that these clauses cannot contain an empty COMP position at LF; i.e. there must be no COMP position at all in these clauses. Strikingly, this fact is mirrored in the interpretation of their tense. Unlike the infinitival relatives (which require a COMP position for the WH-pronoun) and unlike the Control complements (which presumably require the COMP position for the purposes of satisfying strict subcategorization requirements), the infinitival subjects in (76) do not have an Unrealized tense; they are interpreted as being truly untensed, and in this environment they are virtually synonymous with the untensed gerunds:

- (77) a. [Killing animals] is wrong
 b. Itⁱ was wonderful [being released from jail]ⁱ

Moreover, the contrast between these subject infinitivals and their non-subject counterparts cannot simply be attributed to the special status of

the subject position, because if the clause contains a lexical complementizer, the unrealized tense reappears:

- (78) a. [For John to kill his goldfish] would be wrong
 b. It¹ would surprise me [for the prisoners to be released from jail]¹
- (79) a. ??[For John to kill his goldfish] was wrong
 b. ??It¹ surprised me [for the prisoners to be released from jail]¹

(The strangeness of the sentences in (79) follows from the fact that the Unrealized tense of the subject infinitival clashes with the Past tense of the predicate phrase.) Thus we see that the absence of ECP effects with the infinitival subjects in (76) serves as a correct diagnostic for the absence of a COMP position in which the Unrealized tense operator would otherwise appear at LF.

Apart from these differences with respect to the possibility of a clause-internal COMP, infinitival clauses share essential properties with tensed clause complements with respect to Case assignment into COMP. Although WH-extraction from subject position is often blocked, this is because the clause does not assign Case internally to the subject. Since the subject trace does not bear Case, it fails to satisfy the visibility requirement on θ -role assignment, and the θ -criterion is violated.

Interestingly, however, Kayne (1980) observes that in some cases, Case assignment into COMP appears to be sufficient:⁴²

- (80) a. John, [who]₁ I assure you [[e]₁ [[e]₁ to be the best]], ...
 b. *I assure you [John to be the best]

Kayne's idea is that *assure* is capable of governing into COMP -- but not into the subject position of S -- thus accounting for the fact that a lexical subject of the complement clause is only possible if the subject moves through a position of Case assignment in COMP. In our terms, it is

hard to know what to make of this type of example. If Case assignment into COMP were sufficient to permit a lexical subject of an infinitival complement in the case of subject extraction, then we should expect every infinitival Control complement to behave in this way, since Case assignment into COMP should always be possible in structures of WH-movement. Obviously, however, this is not the case. Moreover, it is far from obvious how Case assignment is even possible in (80). The verb *assure* does not belong to the native stem class, so it should not be able to assign Case into COMP without violating the adjacency condition. I will leave this as an unresolved problem.

5.2 Let us now turn our attention away from the COMP position and consider structures in which the subject position of an infinitival clause is directly governed by the matrix verb; these are the cases of \bar{S} -deletion. I have already discussed the means by which a verb assigns Case under government to the subject of its complement; our present interest is in structures where proper government obtains. Consider the following sentences:

- (81) a. [Valerie]_i appears [_S [e]_i to be enjoying herself]
 b. [Kevin]_i was expected [_S [e]_i to buy the ketchup]

In these structures, \bar{S} -deletion must apply in order for the matrix verb to govern the subject position of the infinitival. But government alone is not sufficient to satisfy the ECP, as we have seen. The grammaticality of these sentences implies that the trace in the subject position of the infinitival clause must be properly governed, as observed by Chomsky (1981). The question is, how is this achieved?

It is tempting to assume that the infinitival subjects are properly governed from the COMP position of the infinitival clause; but this can't be possible, since movement from COMP to an argument position results in a

violation of the Binding Theory, as observed by May (1979). This implies that the proper governor of NP-trace in (81) is the matrix Raising verb (or passive participle) itself. But proper government is dependent upon co-indexing with the governing head; therefore the index of the NP-trace must appear in the thematic grid of the governor.

At first glance, this appears to be problematic. Clearly, the matrix Raising verb assigns no θ -role to the subject of the complement clause; moreover, the subject position is not the head of the clause, so we do not expect proper government to "percolate" to this position, as it does in the case of proper government of COMP. Recall, however, that the matrix verb does govern the subject position, by virtue of \bar{S} -deletion. Therefore the only assumption that we need to make in order to derive proper government is that the subject position of the infinitival clause supplies the referential index for the clause as a whole. This is not an unnatural assumption, especially since there is no COMP position in the clausal complement to an \bar{S} -deletion verb. Moreover, the INFL position of the clause contains no nominal Agreement element, which might otherwise be expected to supply the index for the clause.⁴³ Suppose that this assumption is correct. It then follows that proper government holds, since the infinitival clause and its subject are identified by the same referential index, which appears in the slot reserved for the clausal object within the thematic grid of the governing verb or participle.

There are other considerations which lead to the same conclusion in the case of Raising complements. The infinitival complement of a Raising verb is not included in an A-chain that is headed by a case-marked pleonastic element, unlike its tensed clause counterpart. This presents no problem for θ -role assignment in English, since infinitival complements

intrinsically satisfy the visibility requirements, as observed in Chapter 3. But in Italian, Raising verbs take bare infinitival complements.⁴⁴ Recall that these do not behave like English *to*-infinitives, in that they must appear adjacent to the governing verb, implying that they are dependent upon Case assignment in order to be assigned a θ -role. But the Raising verbs do not assign Case, so the clause must be included in an A-chain that is headed by a Case-marked position. In the Raising structures, the only available A-position that could possibly head the chain is the matrix subject position occupied by the raised D-structure subject of the infinitival clause. We might then assume that the matrix subject position supplies Case for two distinct A-chains, both bearing the same index. Obviously this solution creates difficulties with respect to the interaction of the θ -criterion and the theory of θ -role assignment to A-chains; somehow, it must be possible for two distinct chains to make use of a single non- θ -position if this story is to go through. Since this issue is peripheral to the main concerns of this chapter, I will not attempt to formalize the necessary revisions in the definition of chains.

6. In this chapter, we have seen that a number of complex phenomena can be attributed to the effects of the ECP with respect to the COMP position, under the assumption that COMP is the head of \bar{S} . So far, I have ignored the issue of how this assumption ties in with the generally accepted view that \bar{S} is in some sense a projection of S. There are various possible approaches to this, which I will only comment briefly on here.

As observed previously, there is a strong correlation between the choice of a complementizer and the status of the INFL position in S. Under the assumption that COMP is the head of \bar{S} , it is tempting to capture this correlation in terms of subcategorization: we might claim that each

complementizer subcategorizes for an \bar{S} complement headed by an INFL of a specific type. Then the choice of INFL would be determined by virtue of the choice of the complementizer. But this solution is unavailable to us, since we have been assuming throughout that subcategorization features are simply addenda to slots in θ -grids. Therefore a complementizer is incapable of subcategorizing for any complement, given that it assigns no θ -role.

Another approach to this problem would be to view \bar{S} as having two head positions in some sense. Specifically, we might adopt a suggestion of Y. Aoun (personal communication) to the effect that the complementizer and INFL form a discontinuous element. The "matching" between complementizer and INFL would then follow from the fact that the two actually form a single unit at some level, so that selection for one implies selection for the other. We can incorporate Aoun's idea into our theory in the following way. Suppose that COMP is the true head position of \bar{S} ; from this it follows that whenever a governing head subcategorizes for an \bar{S} complement, the clause must contain a COMP position. This derives the fact that the Control complements always have a clause-internal COMP position, as shown by the fact that they always have an Unrealized tense interpretation.⁴⁵ The relationship between COMP and INFL can now be captured by drawing an analogy with the double-headed \bar{X} structure in Dutch. Specifically, we can assume that the head of \bar{S} "spreads" over two positions, i.e. the head positions of \bar{S} and S, respectively. (Recall that the Dutch verbal complex "spreads" over the two head positions in \bar{V} in an analogous fashion.)

This account has a rather striking consequence in the case of subcategorization for a [+WH] complementizer. Assume that the head of \bar{S} is COMP and that direct subcategorization for INFL is impossible, the choice of INFL following from the choice of the complementizer.⁴⁶

But when a verb selects a [+WH] COMP, the relationship between the COMP and INFL breaks down, since the [+WH] complementizer and the WH-phrases that may appear in COMP are equally compatible with either tensed or infinitival S:

- (82) a. I don't know [whether [PRO to come home]] (or not)
 b. I don't know [whether [I should come home]] (or not)
 c. I don't know [what [PRO to do]]
 d. I don't know [what [I should do]]

This means that if a verb subcategorizes for a [+WH] COMP, it should be impossible for the verb to specify whether the complement is tensed (i.e. [+ Past]) or infinitival. Suppose now that a verb subcategorizes for a *that*-clause complement but not for an infinitival. Then if the verb also allows for a [+WH] complement, it ought to be possible for the infinitival structure to occur, by virtue of the fact that the verb cannot directly select for INFL. This prediction is borne out:

- (83) a. Roger pointed out [that we should go to Paris]
 b. *Roger pointed out [(for us) to go to Paris]
 c. Roger pointed out [where we should go]
 d. Roger pointed out [where to go]
- (84) a. Louise explained [that I ought to read Proust]
 b. *Louise explained [to read Proust]
 c. Louise explained [what I ought to read]
 d. Louise explained [what to read]

In some cases, the prohibition against an infinitival complement is maintained even a [+WH] complement (e.g. with *resent* and *regret*), but it seems that this can be attributed to a semantically-motivated selectional property, along the lines suggested by Grimshaw (1979). Where true subcategorization is involved, as in (83-84), the fact that COMP -- and not INFL -- is the head of \bar{S} prevents the governing verb from directly specifying the tense status of the clause.

FOOTNOTES: CHAPTER 6

1. The facts are discussed in Perlmutter (1971), Bresnan (1972, 1977), Chomsky and Lasnik (1977), Taraldsen (1978), Kayne (1980), Pesetsky (to appear), and Chomsky (1981). Much of the discussion in this chapter is based on earlier work of mine in Stowell (1981).
2. In Chomsky's (1981) original formulation of proper government, Condition (4ii) is replaced by a requirement that $\alpha \neq \text{AGR}$. Note that (4ii) presents a problem for our assumption that the [\pm Past] feature provides the head of S with lexical content for the purposes of permitting nominative Case assignment. This requires us to understand "lexical" in two distinct senses, so that [\pm Past] is only sufficient for the purposes of permitting Case assignment.
3. Kayne (1980) is the first to suggest an account of the *that* -trace effect in terms of c-command. The precise definition of c-command is discussed below.
4. For another discussion of the *ne*-cliticization facts see Burzio (1981), who provides an illuminating account of the distinct status of various types of postverbal subject constructions.
5. Chomsky (1981) observes that it is necessary to assume two distinct notions of c-command in order to integrate the *ne*-cliticization facts into a theory which assumes that c-command is a precondition for government.
6. Recall from Chapter 3, Section 4, that this definition of c-command derives the fact that an extraposed subject must adjoin to VP. For an alternative version of c-command, see Borer (1981).
7. The novel aspect of this solution is that it assumes that a phrasal constituent may in some cases substitute for an empty head position. This

recalls the issue of NP-Incorporation discussed in the previous chapter. A similar account of WH-movement through COMP is suggested by Kayne (1981) (fn. 23). This solution may raise a problem with respect to the derivation of the WH-island effect, if WH may pass through two distinct positions in COMP; I will not attempt to resolve this issue here.

8. The so-called *that*-trace effect also shows up with other complementizers, including *whether* and *if*.

9. This account of θ -role assignment appears to render the thematic indexing system of Rouveret and Vergnaud (1980) superfluous. (But see Chapter 7 for further discussion.)

10. Weinberg and Hornstein (1981) argue for this position; see also Chapter 7 for an extensive discussion of Reanalysis and its relationship to preposition stranding.

11. For an alternative interpretation of these facts, see Borer (1981), who argues for a different formulation of proper government.

12. For a discussion of proper government of the subject position of an infinitival complement in \bar{S} -deletion constructions, see Section 5.

13. There are two pieces of evidence that suggest this conclusion, in addition to certain facts discussed further below in the text (Section 3.1). First, where there is clear evidence that Subject Postposing has applied, extraction by WH-movement is blocked:

- (i) a. Thereⁱ has [[occurred] [a terrible disaster]ⁱ]
 b. Itⁱ [[bothers me] [that John did that]ⁱ]
- (ii) a. *[What kind of disaster]_i has there [[occurred] [e]_i] ?
 b. *[That John did that]_i, it [[bothers me] [e]_i]

When these arguments are extracted from true subject position, the ECP is satisfied, by virtue of government from COMP:

- (iii) a. What kind of disaster has occurred?
- b. That John did that bothers me

While it is of course tempting to seek other explanations for these facts, it seems that no other account is really viable. In particular, the definiteness restriction is satisfied in (ii)b, as can be verified by comparing this case with copular *there*-Insertion, which shares the definiteness restriction:

- (iv) [What kind of food]_i is there [[e]_i in the refrigerator] ?

Similarly, the Binding Theory is satisfied in both (i) and (ii), for reasons discussed in Chapter 3. Finally, θ -role assignment is not blocked, by virtue of the fact that Case is assigned to the pleonastic at the head of the A-chain.

The second piece of evidence that the VP-adjoined position is not properly governed comes from the fact that QR cannot apply from this position. Following Kayne (1981), assume that the ECP holds at the level of Logical Form, after QR has applied. If the postverbal subject position is not properly governed, then the ECP explains the failure of QR to apply to a QP adjoined to VP. In most Postverbal Subject constructions in English, QPs may not appear as the postposed subject, for reasons elucidated by Milsark (1974, 1977). But in the PP-Preposing construction, QP can appear as an extraposed subject:

- (v) a. Every horse ran out of the barn
- b. [Our of the barn]_j [e]_jⁱ [ran [e]_j] [every horse]_iⁱ]

There is, however, a significant difference in meaning between (v)a and (v)b, pointed out to me by J. Higginbotham. It is possible to understand (v)a to mean that each of the horses ran out of the barn individually, while

(v)b can only mean that they ran out together as a group. This distinction follows immediately, if we assume that the "group" reading follows from taking the QP to designate a plurality. The true quantifier reading is only possible if QR applies, and this is blocked in (v)b because the post-verbal subject is not properly governed by the verb, parallel to the WH-movement examples in (ii). These ECP violations all follow straightforwardly if we assume that there is no slot in the thematic grid of the verb reserved for the subject argument, thus preventing co-indexing with the extraposed subject NP.

14. Rizzi's arguments are based on a complex array of data associated with *ne*-cliticization, WH-movement, QR under "negative attraction", and other phenomena. It is unlikely that English and Italian differ with respect to the assignment of the subject θ -role; it is therefore plausible to attribute the difference with respect to proper government to the fact that the Agreement element appears on the verb in Italian (but not in English) at the level relevant to the ECP. In fact, Chomsky (1981) suggests that this difference constitutes the basis of the so-called pro-drop parameter. On the other hand, the Italian type of extraction appears to be possible in French, which is not a pro-drop language. This suggests either that Agreement is not responsible for proper government of the extraposed subject, or else that the placement of Agreement on the verbal head is not the correct basis of the pro-drop option. I will not attempt to resolve this problem here.

15. Actually, there is another version of this idea, also noted by Huang, which is based on the solution proposed in Section 3.3 for the possibility of extracting from the object position of a clausal complement to a non-bridge verb. Specifically, suppose that all rules mapping to LF are

optional, so that empty categories will be mapped only for the purposes of satisfying general principles such as the θ -criterion, the Projection Principle, or the ECP. Suppose further that COMP can be construed as the specifier position of S for the purposes of adverbial modification. Then it would be possible for the extracted PPs in (21) to be derived from their counterparts in (20), provided that the PP-trace in VP is not mapped to LF. The trace in COMP left by successive-cyclic application of WH-movement suffices to allow the extracted PP to be construed as an adverbial modifier of the embedded clause.

16. Note that it is possible that the finite complementizers *that* and *[e]* are actually responsible for assigning nominative Case, parallel to *for*. But this raises questions about nominative Case assignment in main clauses and in structures where WH-movement passes through the head position in COMP, so I will not adopt this assumption here.

17. Actually, Grimshaw (1979) argues that the presence of WH in COMP does not necessarily signal the presence of an interrogative structure, since exclamative complements also have [+WH] COMPs.

18. For instance, when a verb subcategorizes for a VP complement, it can specify whether the verbal head is progressive or not; this distinguishes the Perception verbs from the Causatives. Similarly, verbs which select AP complements may determine whether or not the adjectival head is stative, while PP complements can be selected according to whether the prepositional head is directional or locative.

19. Grimshaw's "concealed questions" might just as easily be characterized as "concealed propositions"; thus *the time* in *he told me the time* might be paraphrased as *what the time was*, or *that the time was x*, where *x* has some arbitrary value. The examples of null complement anaphora are not

amenable to this kind of treatment, as Grimshaw shows; but these might be handled by a rule of reconstruction, along lines similar to that pursued by Higginbotham (forthcoming).

20. Safir (1981a) argues that INFL, rather than COMP, is the head of \bar{S} , deriving various patterns of inversion structures from this assumption. I will return to this issue in Section 6.

21. The clause may not bear Case by virtue of the CRP; but it is unable to extrapose by virtue of the fact that its trace is not properly governed by the preposition. Reanalysis of the preposition into the structure of a complex verb is blocked in the case of rightward movement by the Antecedent Condition on Reanalysis; see Chapter 7 for discussion.

22. The implicit assumption here is that traces are not "layered". If this assumption were to prove untenable, we might revise our claim by virtue of exploiting the fact that even a layered trace would not have true lexical content. This would force us to adopt the "discontinuous head" analysis of \bar{S} suggested by Y. Aoun (personal communication). See Section 6 for discussion.

23. Emonds (1976) observes that interrogative complements share the distribution of NPs in a number of environments. He also points out the contrast between the structures in (28) and those in (32), where a PP appears in COMP, providing a different explanation for the distinction between the two types of WH-complements.

24. Note that if Case must "percolate" to an NP in COMP, it follows by virtue of the prohibition against Case conflict that Case assignment is not cyclical. If Case assignment is at S-structure, as assumed by Chomsky (1981), then the Case is assigned to the variable trace, as required.

25. In Chomsky (1981), it is assumed that the process of \bar{S} -deletion actually proceeds in two steps, in a sense. The rule triggered by the verb replaces the \bar{S} node dominating S with another S-node. Then if COMP is empty, the theory of phrase structure proposed by Lasnik and Kupin (1978) makes this structure equivalent to a structure with a single S node. The presence of COMP thus blocks the second step in \bar{S} -deletion. The empirical evidence for COMP blocking the second step actually does not come from the Case assignment facts, since the failure of Case assignment to the subject position could be attributed to the adjacency condition on Case assignment. Rather, the crucial evidence comes from Raising constructions, where proper government of the subject position of the infinitival is blocked when COMP is filled. See also Section 5.2.

26. Borer's account is actually slightly different, since she assumes that trace in COMP can inherit Case from the Case-marked subject position. This possibility must be blocked if the structures in (-3) are to be ruled out along the lines suggested here.

27. For instance, one might stipulate that a WH-trace in COMP is not properly governed when the clause is superscripted with a pleonastic element. Such a stipulation would be entirely arbitrary, however, since proper government of an empty (non-WH) complementizer is permitted in this context.

28. Belletti and Rizzi interpret the trace of the clitic *ne* as the head position of NP, thus deriving the fact that the NP containing the trace must be properly governed. Notice that if this assumption is correct, we must assume that gerunds do not contain an empty head position, contrary to some previous analyses.

29. See Section 1.5 above, especially fn. 13.

30. This account differs from that proposed in Stowell (1981), where it was necessary to stipulate that nouns do not subcategorize for \bar{S} complements. A possible problem for this account is posed by the fact that the complement of a [+R] derived nominal may not contain an empty complementizer, despite the fact that θ -role assignment is possible in these structures. I have no explanation for this.

31. See Safir (1979) for discussion and references.

32. This contrast is noted by Kayne (1981) (fn. 23).

33. I have benefitted from discussions with T. Roeper on these facts and related issues.

34. Note that the manner-of-speaking verbs allow for NP objects, provided that they refer to the speech signal itself, rather than to its propositional content:

- (i) Valerie sighed [a sigh]
- (ii) Kevin shouted [an objection] from the floor
- (iii) John muttered [a few words] under his breath

Although *objection* in (ii) provides a clue as to the nature of the propositional content, it is not a true "concealed proposition", but rather functions as a name for the speech signal.

35. Alternatively, we might assume that the ECP only applies to the head positions of a phrase. (This is similar in spirit to Safir's (1981b) suggestion that the ECP only applies to chains that are co-indexed with a θ -position.) See also Kayne (1981), who suggests that Subjacency can be dispensed with, given a reformulation of the ECP. This assumption is incompatible with the version of proper government assumed here, since the

Complex NP Constraint does not follow from the ECP, as formulated in (3).

36. See fn. 15 for related discussion. As R. Kayne has observed (personal communication), this account of the subject/object asymmetry with respect to extraction from these complements is incompatible with the assumption that Subjacency is a condition on LF representations. On the other hand, one might assume that Subjacency is a condition on S-structure representations, if this principle does not constrain LF movement; but cf. May (1977).

37. A problem arises with respect to extraction from subject position of an \bar{S} subject. If WH-trace appears in COMP, we might expect it to be possible for the clause to be assigned nominative Case, which would percolate to the trace in COMP. Then the \bar{S} could remain in subject position, and Subjacency would not prevent COMP-to-COMP movement to the matrix. In order to rule out the structure, we must stipulate that trace cannot properly govern the head position of \bar{S} across an S boundary.

38. Passivization of these verbs is permitted, but only by virtue of absorbing the Case that is assigned to the NP object:

- (i) [Roger]_i was persuaded [e]_i that his hamburgers were worth buying
- (ii) *[That his hamburgers were worth buying] was persuaded (Roger)
- (iii) *It was persuaded (Roger) [that his hamburgers were worth buying]

Thus precisely the same structure of argument applies to the passive examples as holds for Topicalization.

39. Recall that the clausal complement of a [+R] adjective may not be topicalized:

- (i) *[That he has to eat well]_i, John is aware [e]_i

40. Extraction of the NP object is possible if the clause contains a *that*

complementizer. This suggests that *tell* allows a second subcategorization frame in which only the direct object NP is assigned a θ -role; the clause in this structure would be linked to the verb's thematic structure by the interpretive rule that applies to the complements of the manner-of-speaking verbs. Presumably this is the strict subcategorization frame responsible for deriving Grimshaw's "null complement" structure:

(1) I told John already.

41. Recall that Den Besten (1978) provides an alternative account, according to which Tense originates in COMP at D-structure. This is entirely compatible with the general framework of assumptions of this chapter, since it might be argued that if Tense is subcategorized for, it must appear in the head position of \bar{S} at D-structure.

42. Kayne's discussion assumes that the relevant principle is Chomsky's (1980) Case filter; cf. Chapter 3 for discussion of this. The translation of Kayne's idea into a visibility account is straightforward.

43. I assume that r-indices are only associated with categories that have [-V] heads (i.e. NP, PP and \bar{S}). (Recall that only these categories can appear in cleft constructions with a restrictive *that*-relative clause.)

44. I am grateful to Tarald Taraldsen for bringing this issue to my attention.

45. Recall that the Tense operator must appear in COMP at LF, if COMP is present; see Section 5.1 for discussion.

46. See Section 2.1 for discussion.

CHAPTER SEVEN: CONDITIONS ON REANALYSIS

1. The Status of Preposition Stranding

1.1 It has been observed by Van Riemsdijk (1978b) that preposition stranding is a relatively marked phenomenon cross-linguistically, being attested primarily in Germanic languages -- English and Dutch, in particular.¹ Van Riemsdijk argues that this fact should be reflected in the theory of grammar, such that the possibility of having preposition stranding in a given language would be crucially dependent upon some special circumstances being met.

A natural way of deriving this result is to adopt Kayne's (1981) suggestion that prepositions are not proper governors. Recall from Chapter 6 that a category α is properly governed only if it is governed by some head X^0 with which it shares a referential index. There are three ways in which this can happen. The first concerns special properties of relative clauses, which we will not consider here. The second is by means of movement to the head position of \bar{S} , as in WH-movement and related rules. By convention, *Move* α involves co-indexing, so a WH phrase (or a WH-trace) in COMP always shares an r-index with its trace in the A-position. Since S is not a barrier to government, an element in COMP can properly govern its trace in the subject position of a tensed clause. The third means of deriving a structure of proper government is by means of θ -role assignment. When a lexical head assigns a θ -role to a complement that it governs, the complement's r-index is entered in the appropriate slot of the θ -grid of the head.

Let us now consider the status of the object of a preposition with respect to proper government. Clearly neither of the first two structures

of proper government is involved here. This means that a preposition could only properly govern its object if it were to assign a θ -role to it. Recall from Chapter 3 that we raised the possibility, noted by Hagit Borer, that a verb does not actually assign a θ -role to a PP complement, but rather to the object of the preposition within the PP. If this is correct, then it implies that the preposition itself does not assign a θ -role to its object. Let us assume that this is the case; it then follows that prepositions are not proper governors, since they govern their objects, but are not coindexed with them via θ -role assignment. Then under normal circumstances stranding should be impossible: the empty category in the object position within PP would not be properly governed, resulting in an ECP violation.

How, then, is stranding ever possible? Van Riemsdijk (1978b) suggests that in some cases, stranding is allowed by virtue of a special rule which reanalyzes a preposition and its governing verb into a single complex verb, deriving (1b) from (1a):

- (1) a. $[\bar{V} \ V - [\bar{P} \ P - NP]]$
 b. $[\bar{V} \ [V \ V - P] - NP]$

In terms of an ECP account, Reanalysis makes perfect sense, as noted by Kayne (1981). After Reanalysis applies, the NP in (1b) is governed by the derived complex verb. If this verb assigns a θ -role to the object, then it properly governs it, and the ECP is satisfied. (See also Weinberg and Hornstein 1981 for an analogous account in terms of Reanalysis.)

Van Riemsdijk also suggests that Reanalysis observes a kind of adjacency requirement: two constituents can only be reanalyzed into a single constituent if they are string-adjacent at the relevant level of analysis. This condition is met in the English structure corresponding to (1), where (2b) is derived from (2a):

- (2) a. John [\bar{V} spoke - [\bar{P} to - which man]]
 b. [Which man] did John [\bar{V} [V speak - to] - [e]]

More striking evidence for this condition comes from Dutch, which allows restructuring to apply in a configuration which is the mirror-image of (1), deriving (3b) from (3a):

- (3) a. [\bar{V} [\bar{P} NP - P] - V]
 b. [\bar{V} NP - [V P - V]]

Significantly, although Dutch has both prepositional and postpositional phrases, stranding is only possible in the latter case:

- (4) a. [Waar]_i probeert zij e in te klimmen
 Where_i tries she in to climb
 'What is she trying to climb into?'
 b. *[Wie]_i heb je deze plaat voor [e]_i gekocht?
 Who_i have you this record for_i bought
 'Who have you bought this record for?'

In (4), stranding is allowed with the postposition *in* but not with the preposition *voor*. Sentence (4a) is grammatical because Reanalysis applies, deriving the structure (3b). Since the trace is properly governed by a complex verb, there is no ECP violation. But this "saving strategy" is unavailable for (4b), because the trace intervenes between the preposition *voor* and the governing verb; Reanalysis is blocked and an ECP violation results. The adjacency requirement thus provides a principled account of the failure of Reanalysis to apply in certain domains. Van Riemsdijk also points out that this story can also be invoked to explain part of the reason why preposition stranding is so rare in other languages: it should only be possible in languages that have constructions corresponding to (1a) and (3a).

1.2 Unfortunately, the scope of Van Riemsdijk's cross-linguistic claim is circumscribed by two factors. These relate to the predictions of X-bar theory and to his use of a PP-internal escape hatch in certain constructions. We will consider each of these in turn.

Observe that the patterns of constituent order in (5) are the set of phrase structure configurations that a language must have in order to meet Van Riemsdijk's adjacency condition:

- (5) a. $[\bar{V} \ V - NP \ \dots]$
 $[\bar{V} \ V - PP \ \dots]$
 $[\bar{P} \ P - NP \ \dots]$
- b. $[\bar{V} \ \dots NP - V]$
 $[\bar{V} \ \dots PP - V]$
 $[\bar{P} \ \dots NP - P]$

But these are exactly the two patterns that are expected to be the most common, given X-bar theory; in fact, given the restrictive theory of a category-neutral base developed in the preceding chapters, the patterns (5a) and (5b) are the only ones which should occur in human languages.² Recall that (5a) occurs in English, French, and Italian, while the pattern in (5b) occurs in languages such as Malayalam, Turkish and Japanese, and in the Dutch structure in (5a). Therefore, the adjacency condition has nothing to say about the fact that stranding is impossible in these languages. One must therefore claim that Reanalysis is a marked rule, as in Weinberg & Hornstein (1981).

Another respect in which the force of Van Riemsdijk's cross-linguistic claim is limited is that he allows more than one way for stranding to occur. Specifically, he assumes that certain stranding constructions are derived

by means of movement through a PP-internal "escape hatch", analogous to the COMP position in \bar{S} . Van Riemsdijk's theory is designed to attribute the normal "island" status of PPs to the subjacency condition on *Move α* , under the assumption that PP is a bounding node. He argues that English PPs contain a COMP position that functions as an escape hatch for WH-movement, while Dutch PPs contain an "R-position", which functions as an escape hatch for two rules: WH-movement and a rule of "R-movement".

The notion that categories other than \bar{S} may contain escape hatches analogous to COMP is troubling for several reasons. First, we have seen in the previous chapters that COMP has a special status as an operator position which requires a propositional complement. Moreover, it seems that this position is actually the head of \bar{S} , as suggested by the facts relating to subcategorization and proper government. It would therefore be surprising to see this position appearing in categories such as PP. Second, Van Riemsdijk's use of the PP-internal escape hatch is incompatible with the assumption that prepositions are not proper governors.³ If it is correct that only the head position of a phrase may govern other constituents within it, then the trace in the object position in PP would violate the ECP, even if the application of movement observed Subjacency. In a sense, these are both technical problems, which might be eliminated in one way or another. But the escape-hatch account is also unsatisfactory for a more fundamental reason. Since this theory allows for two quite distinct strategies for deriving stranding structures, it has to be treated as an absolute coincidence that both of these just happen to be used by the grammars of Dutch and English. Conversely, in order to account for the fact that languages

such as French and Italian lack stranding, it is necessary to claim not only that these languages lack V-P Reanalysis -- despite the fact that they have the requisite structures in (5a) -- but also that their PPs have no internal escape hatches. Clearly it would be desirable to reduce these to a single option.

These considerations suggest that it might be worthwhile refining the Reanalysis account of preposition stranding in response to these objections. First, in order to account for the rarity of stranding constructions, it would be desirable to place certain principled restrictions on the rule so that its absence from French and Italian could be tied to some other aspect of these languages. Second, in order to eliminate the "escape hatch" option, it would be desirable to subsume all the stranding constructions under a Reanalysis story. To do this, we must first consider Van Riemsdijk's motivation for keeping the two cases of stranding distinct. We turn our attention to the English examples first.

2. Reanalysis in English

2.1 Primarily on the basis of examples such as (6) and (7), Van Riemsdijk argues that Reanalysis is responsible for English pseudo-passive constructions, but not for the WH-movement cases:⁴

- (6)
 - a. Lucia borrowed the book from the library
 - b. Jack discussed the weather with Sarah
- (7)
 - a. [Which library] did Lucia borrow the book from -- ?
 - b. [Who] did Jack discuss the weather with -- ?

- (8) a. *[The library] was borrowed the book from --
 b. *[Sarah] was discussed the weather with --

His approach was as follows. The freedom of WH-movement vs. NP-movement suggests that whatever property makes movement to COMP possible in (7) must be unavailable in the case of movement to subject position in (8). Now independent principles rule out movement from COMP -- or, in our terms, from any non-A-position -- into an A-position such as the object slot in (8). (See May, 1979 for some recent discussion of this.) Therefore it is reasonable to assume that the WH-movement constructions make crucial use of a non-A-position within PP as an intermediate step in movement out of the domain of the preposition. Suppose that PP and S are bounding nodes for subjacency. Then stranding via WH-movement will be impossible in a language that has no PP-internal COMP. If bounding nodes do not parametrize, then the English child, on hearing (7), will deduce that there must be a PP-internal COMP.⁵

In order to rule out movement to subject position in (8), Van Riemsdijk proposes a condition which he calls the Head Constraint. This has the effect of ruling out direct movement from within the complement (i.e. the \bar{X} level) of a lexical head to a position outside of the maximal projection of the head. In order to account for the grammatical pseudopassives in (9), he invokes the now-familiar V-P reanalysis rule:

- (9) a. John was spoken to --
 b. This bed has been slept in -- too much
 c. The lock has been tampered with --

Reanalysis is blocked in (8) because of the intervening NP.

This is the basic structure of Van Riemsdijk's analysis of English, although he extends it to cover a slightly wider range of facts, some of which we shall discuss below. Although his account achieves the desired distinction between WH-movement and NP-movement, it does so at the cost of admitting two entirely distinct strategies for deriving stranding constructions, as we have seen.

2.2 In chapter 5, I suggested that English has word-formation rules which derive complex verbs with the following structures:

- (10) a. $[_V V - NP]$
 b. $[_V V - \text{Prt}]$

The rules of NP-Incorporation and Particle Incorporation, which derive (10a) and (10b) respectively, also interact to form the complex verbal structure in (11):

- (11) $[_V V - NP - \text{Prt}]$

The three structures are exemplified in (12-14) respectively:

- (12) a. Someone [wrote my aunt] a letter
 b. We [promised John] to leave him alone
 (13) It [struck John] that Bill was unfriendly
 (14) a. I [called up] my friend
 b. We [struck up] a deal with the landlord
 (15) a. Kevin [switched the light on]
 b. The board [sent the members out] an announcement

Recall that in each case, the verb must belong to the Native stem class. Recall further that the Particle Incorporation rule generalizes so as to apply to passive participles, but the NP-Incorporation rule does not:

- (16) a. My friend was [called up] yesterday
 b. The members were [sent out] an announcement
- (17) a. *This letter was [written my aunt] yesterday
 b. *The announcement was [sent the members out] yesterday

Thus alongside (10) and (11), the rules of the word-formation component also generate complex passive participles with the structure in (18), but not with the structure in (19):

- (18) [_[+V] [V-en] - Prt]
- (19) a. * [_[+V] [V-en] - NP]
 b. * [_[+V] [V-en] - NP - Prt]

Suppose now that particles are actually intransitive prepositions, as suggested by Emonds (1972). In formal terms, this would mean that particles, like normal prepositions, have the features [-V, -N]. Particles do not subcategorize for NP, so their Case-assigning feature [-N] goes unused, but this does not affect their categorial status any more than it does for intransitive verbs. Therefore we can reformulate the structures produced by the word-formation rule of Particle Incorporation as (20):

- (20) a. [_V V - P] (= 10b)
 b. [_V V - NP - P] (= 11)
 c. [_[+V] V-en - P] (= 18)

Since the rules deriving these structures belong to the word-formation component, they are language-specific, and display various categorial asymmetries, as we saw in Chapter 5.

Now there is a striking fact which jumps out of the arrangement of elements in the internal structure of the complex words in (20): these are precisely the set of constituents which may appear within a reanalyzed verb

or participle preposition stranding constructions. Observe:

- (21) a. [Who]_i did you [\bar{V} speak - to] [e]_i (cf. 20a)
 b. [Who]_i did Jack [\bar{V} discuss - the weather - with] [e]_i (cf. 20b)
 c. [The lock]_i has been [$\overline{+V}$] tampered - with] [e]_i (cf. 20c)

In contrast, the ungrammatical pseudopassive constructions in (8) have no corresponding structure produced by the word-formation rules; the relevant structure (19b) does not exist, because NP-Incorporation does not apply to a passive participle, as shown by the status of (17).

This suggests that we can account for the asymmetry between WH-movement and NP-movement with respect to preposition stranding by assuming that Reanalysis is subject to the following "structure-preserving" condition:⁶

(22) The Structure-Preserving Condition on Reanalysis

A string of words, *S* may be reanalyzed so as to form a complex word, *W*, only if:

- (i) *S* can be properly analyzed as a string of adjacent syntactic constituents of the form [$\alpha_1, \dots, \alpha_n$], where α_1 has a specified matrix of categorial features M_1 , and a specified bar-level L_1 , and
- (ii) there is a string of constituents *S'*, consisting of a set of adjacent terms [β_1, \dots, β_n], where β_1 has the categorial feature matrix M_1 , and the bar-level L_1 , and
- (iii) *S'* is defined as a word by the rules of the word-formation component.

Note that condition (22) requires string-equivalence between *S* and *S'* and does not make any claims about the effects of the embedded morphological structure within the word, nor about the hierarchical structure dominating the constituents of *S*. Furthermore, Condition (22) is "blind" to stem-class distinctions, so Reanalysis can create complex words that could never be

created by the rules of the word-formation component themselves. Thus the verbs in (23) are all Latinate (non-Native) so they could never have been combined with NP's or particles by the rules of NP-Incorporation or Particle Incorporation:

- (23) a. Which doctrine did the priest [pontificate about] -- ?
b. Which child did he [exorcise the demon from] -- ?
c. These facts have not been [accounted for] --

Reanalysis is also blind to the identity of the prepositions included in the string to which it applies: thus the prepositions *for* and *from* do not normally occur in Verb-Particle constructions, but they are subject to Reanalysis nonetheless. Since Reanalysis is only sensitive to the categorial features and the hierarchical X-bar level of the constituents that it groups together, the complex words of (23) are possible.⁷

Notice that the Structure-Preserving Condition (22) not only provides an explanation for the failure of Reanalysis to apply "across" NP in pseudopassive constructions in English; it also provides a possible explanation for the fact that the Romance languages (e.g. Italian and French) lack stranding constructions entirely. English has verb-particle constructions, and given the Adjacency Condition on Case assignment, this means that the English child is forced to assume that there is a word-formation rule of Particle Incorporation. Dutch also has a Particle Incorporation rule, which we shall discuss in section 1.3. Therefore V-P reanalysis is possible in these languages. But the Romance languages have no counterpart to the Verb-Particle construction. It therefore follows from Condition (22) that V-P Reanalysis is unavailable in these languages, in principle. Thus the dependence of reanalysis upon the independent existence of a Particle

Incorporation rule allows us to explain the rarity of preposition stranding constructions without stipulating that V-P Reanalysis is a marked rule.

2.3 The Structure-Preserving Condition also provides an explanation for certain apparent violations of the Subjacency condition on *Move α* involving extraction from complex noun phrases. It has been observed that the following sentences are grammatical -- contrary to expectations, given the account of Ross' (1967) Complex NP Constraint presented in Chomsky (1973):

- (24) a. [Which boys]_i did you take [_{NP} pictures of [e]_i]
 b. [Who]_i did Kathy write [an article about [e]_i]

These structures ought to involve violations of the Subjacency condition, since movement to COMP crosses two bounding nodes (NP and S). Interestingly, however, these apparent violations are limited to constructions involving extraction from object position:

- (25) a. *[Which boys]_i were [pictures of [e]_i] sent to the newspaper?
 b. *[Who]_i did [an article about [e]_i] appear in the newspaper?

The contrast between (24) and (25) suggests the involvement of a reanalysis rule, as has been observed by N. Chomsky. Suppose that this is correct. We might then ask what form this rule takes. One might be tempted to suppose that (24) is derived by WH-movement applying to the output of some sort of extraposition rule which dissociates the modifying PP from the NP containing it. But extraposed modifiers are normally islands for movement; thus (26a) is ungrammatical, despite the fact that its potential source in (26b) is fine:

- (26) a. *[Who]_i has a book appeared in the stores by [e]_i ?
 b. A book has appeared in the stores by Watson

This suggests that dissociation of the modifying PP from its head is not sufficient to account for (24). Suppose instead that these sentences are derived by means of the same Reanalysis rule that is involved in (23b). That is, if we assume an adjunction analysis for relative clauses, then the sentences in (24) could be derived by reanalyzing the string in (27a) so as to form the complex verb in (27b):

- (27) a. $[\bar{V} \ V - [_{NP} \ NP - [_{PP} \ P - NP]]]$
 b. $[\bar{V} \ [_{V} \ V - NP - P] - NP]$

Since Reanalysis is blind to the hierarchical structure dominating the strings of terms that it analyzes, it simply looks at the string $[V - NP - P]$ in (27a) and reanalyzes this into the complex verb in (27b), just as it does in (23b).⁸

This account makes two rather straightforward predictions. First, since NP-Incorporation does not apply to passive participial stems, there should be no pseudopassive counterpart to (24). This is correct:

- (28) a. *The boys were [taken pictures of] --
 b. *Scott was [written an article about] --

Second, since reanalysis of the preposition is dependent upon the existence of a Particle Incorporation rule, we should expect that if other reduced modifiers are substituted for PP in (24), extraction should be impossible. Right again:⁹

- (29) a. Kathy wrote an article describing Scott
 b. *[Who]₁ did Kathy [write an article describing] [e]₁ (cf. 24b)

Thus in a superficially unrelated structure, the same rule of Reanalysis turns out to be at work, blindly reanalyzing strings of adjacent constituents,

regardless of their grammatical function. Note that this account also predicts -- correctly, I believe -- that extractions such as those in (24) should be possible only in a language which has both an NP-Incorporation rule and a Particle Incorporation rule.

2.4 The Structure-Preserving condition may also help explain a special property of the English Tough-movement construction. Chomsky (1981) argues that this construction involves clause-internal WH-movement, combined with a reanalysis rule which creates complex adjectives of the form in (30):

- (30) a. Mary is [_A difficult for John to give a book to] --
 b. This race should be [_A easy for you to persuade John to enter] --

I do not propose to go into a detailed account of this complex construction, nor to justify the derived structure represented in (30); for detailed discussion, the reader is referred to Chomsky (1981). Instead, I would like to concentrate on one rather striking property of the English Tough-movement construction which is unattested in otherwise similar constructions in many other languages. Specifically, the English construction allows for an unbounded dependency between the governing adjective and the trace position -- as shown in (30), and even more strikingly in (31):

- (31) John should be easy for us to tell Bill that he really ought to ask Mary to tell Jane to invite --

In contrast, similar long-distance extractions in Dutch are ungrammatical, despite the fact that it can be shown that clause-internal WH-movement is involved, as noted by Van Riemsdijk (1978a):

- (32) *Dit argument is gemakkelijk om te zeggen dat je niet in geloof
 this argument is easy for to say that you not in believe
 'This argument is easy (for you) to say that you don't believe in'

Similar facts obtain in other languages as well. The fact that the English rule can apply in an unbounded domain is surely one of the greatest mysteries associated with this construction. It is highly implausible that English children learn the unbounded character of the construction by hearing the complex extraction structures that commonly appear in the technical literature of generative grammar; surely some simpler clue is provided for them.

Suppose that it could be shown that the involvement of the Reanalysis rule is crucial in allowing the unbounded structure in English. Then if it could be shown that other languages lack this rule, it would be possible to derive the relevant distinction.¹⁰ But what kind of evidence could inform the English child that this language-specific Reanalysis rule exists? Unless some plausible answer to this question can be provided, there is no advantage in shifting the burden of explanation to the Reanalysis rule, from the perspective of the theory of acquisition. It seems that the Structure-Preserving Condition (22) may provide the missing clue.

Recall from previous discussion that Nanni (1980) argues that the rules of the English word-formation component produces complex adjectives built on adjectival stems belonging to the Tough-movement class. Such a rule is required in order to account for the prenominal adjectival construc

- (33) a. [_N an [_A easy - to clean] carpet]
 b. [_N a [_A hard - to solve] problem]

For the present discussion, it is immaterial whether the infinitival complement embedded within the complex adjective has the categorial status of S or -- as Nanni claims -- VP.¹¹ The crucial point is that on hearing structures such as those in (33), the English child must assume that the relevant complex adjectival structure is derived by the word-formation component -- especially

given the analysis of prenominal adjectives presented in Chapter 4.

The existence of such a word-formation rule is all the evidence that the English child needs to deduce that A-S (or A-VP) Reanalysis is possible in the constructions in (30) and (31), since A-S reanalysis will satisfy the Structure Preserving Condition (22). In this way, the possibility of "unbounded" Tough-movement could be determined on the basis of the everyday constructions in (33), and the problem of induction from the impoverished stimulus would be resolved in this case.¹²

It is perhaps worth pointing out that if this scenario is generally speaking correct, then it is likely that Reanalysis is far from being a "marked" rule, if we interpret "marked" in the technical sense of Markedness Theory, rather than in the nontechnical sense of "uncommon in languages of the world". Specifically, if the possibility of Reanalysis in (30-31) can be deduced from the existence of the word-formation rule responsible for the complex adjectives in (33), then we must assume that Reanalysis is not just unmarked, but also automatically available where (22) is satisfied, unless we are to assume that sentences such as (31) form an integral part of the primary linguistic data.

2.5 Let us now return to consider in greater detail the effect of Condition (22) on Preposition Stranding constructions. We have seen that Van Riemsdijk's adjacency condition, which we have incorporated into (22i), accounts for the fact that reanalysis cannot "skip over" an intervening NP so as to derive pseudopassive constructions such as those in (8) and (25). Nevertheless, it seems that the adjacency requirement must be interpreted as operating on a slightly abstract level of representation. Consider:

- (34) a. [Which shoes]_i did you [walk (across Europe) in] - [e]_i ?
 b. [Which toys]_i did the children [play (outside) with] - [e]_i ?
 c. [Who]_i did you [speak (severely) to] - [e]_i ?
- (35) a. [These shoes]_i have been [walked (across Europe) in] - [e]_i
 b. [These toys]_i have been [played (outside) with] - [e]_i
 c. [John]_i has been [spoken (severely) to] - [e]_i

All of the reanalyzed verbs and participles in (34-35) violate the Structure-Preserving Condition -- unless the material in parentheses is omitted. Not even an active complex verb has an incorporated PP or adverbial position in it -- otherwise we would have found apparent violations of the Adjacency Condition on Case assignment in English, analogous to those found in Italian and Dutch. Suppose that we were to abandon Condition (22) in order to allow for (34-35). Then we would have no account for the cases where Reanalysis is blocked; not only in English, but also in other languages. It seems that a more fruitful approach would be to try to find some independent explanation for why Reanalysis is possible in these cases.

It has been observed by various investigators that Reanalysis interacts in complex ways with the thematic structure of the governing head. It is well-known that the subject of a passive construction must function as a "logical object", in some sense. It seems that this involves being affected by the action, in ways that we shall leave imprecise. This is illustrated by examples like (36), noted by Fiengo (1977):¹³

- (36) a. John resembles Ray Davies
 This fraction equals that number
 b. *Ray Davies is resembled (by John)
 *That number is equalled (by this fraction)

Similar effects can be observed in the pseudopassive structures in (37), vs. the superficially similar cases in (38):¹⁴

- (37) a. ?*John's mother has been [travelled with] -- (by him)
 b. ?*New York City has been [slept in] -- (by John)
- (38) a. This suitcase has been [travelled with] -- too much; it's starting to fall apart
 b. This bed has been [slept in] -- too much

Similar restrictions involving "agentivity" appear to govern the Tough-movement constructions, as noted by Nanni (1978). Even for WH-movement, the acceptability of stranding increases proportionally to the "closeness" of the link between the prepositional object and the thematic structure of the verb, as observed by Weinberg and Hornstein (1981) and others. Although the particular thematic conditions on Reanalysis appear to differ from one construction to the next -- they seem most stringent with pseudopassives -- it is reasonable to suppose that Reanalysis quite generally involves some sort of "thematic restructuring", as proposed by M. L. Zubizarreta, who relates this to Chomsky's (1981) Projection Principle. In fact this makes sense in terms of the ECP, if proper government by V is dependent upon θ -role assignment, as suggested in Chapter 6.

Given the relevance of the thematic structure of the verb for Reanalysis, there is a possible solution to the problem posed by examples such as (34-35), where the adjacency requirement in (22i) appears to be violated. Specifically, we can assume that Reanalysis -- like the rules of Case assignment in Italian and Dutch -- applies to an abstract representation where all the prepositions in (34-35) are adjacent to the governing verb or participle. This level is the projection consisting of the verb and its arguments -- the Argument Projection discussed in Chapter 3.¹⁵ Since the

adverbial elements within parentheses in (34-35) are absent from the Argument Projection, Condition (22) is satisfied at the relevant level of application.

Note that it is impossible for NP objects to be excluded from the Argument Projection, since they are linked to the argument structure of the verb by means of coindexing with specific slots in the verb's thematic grid. Since the NP-Incorporation rule does not extend to passive participles, the cases in (8) will still be ruled out; the adjacency requirement blocks simple V-P Reanalysis across the NP object. Similar facts obtain with respect to PP arguments, which contrast markedly with the "adverbial" PPs in (35):

- (39) a. *[Our income] is [dependent - on the government - for] --
 b. *[John] was [talked - about Bill - with] --

The constraint against Reanalysis across a PP argument seems to be much looser -- in fact, virtually inoperative -- in stranding constructions derived by WH-movement, and in Tough-movement constructions:

- (40) a. [Which income] do you [depend - on the government - for] --
 b. [John] is [easy - for us - to talk about Bill to] --

Note that the relevant PP in (40b) is *for us*; this appears to violate (22), since the PP may never be included in a complex adjective that is derived by a word-formation rule, as shown by Nanni (1980):

- (41) a. *[an [easy - for you - to clean] carpet]
 b. *[a [hard- for anyone - to solve] problem]

Whatever the ultimate explanation for the violations in (40), I will continue to assume (22i) in its strongest form, since there is no clear alternative of the full range of phenomena discussed above.

2.6 It seems that another condition must be placed on reanalysis. Van Riemsdijk (1978b) observes that Focus NP Shift (his *Heavy NP Shift*) can never apply to the object of a preposition:

- (42) a. I can't talk [about the horrible dreams that I've been having]
to my father-in-law
- b. I'll look [into the issues that you've raised] with my new
assistant
- (43) a. *I can't talk [about --] to my father-in-law [the terrible
dreams I've been having]
- b. *I'll look [into --] with my assistant [the issues that
you've raised]

Although the ungrammaticality of (43) follows from the ECP if the trace of the shifted NP is governed only by the preposition, we would normally expect V-P Reanalysis to be possible here, as in (23a).

Similar conclusions can be drawn from the fact that prepositions cannot take tensed clauses as their objects:

- (44) a. Reagan was talking about invading El Salvador
We'll look into your claim that the water is dirty
- b. *Reagan was talking about that the Marines might visit El Salvador
*We'll look into that the water might be dirty

It would be missing the point to claim that these prepositions simply fail to subcategorize for \bar{S} , since this is a property not just of the prepositions in (44), but of all prepositions.¹⁶ Recall that the Case Resistance Principle prevents \bar{S} from being assigned Case, since its head bears the Case assigning feature [+Tense]. This suggests that the ungrammaticality of (44) can reasonably be pinned on the CRP. This suspicion is confirmed by the fact that the sentences in (45) seem much better than those in (44):¹⁷

- (45) a. ?[That the Marines have been invited to El Salvador], Reagan
was talking about -- yesterday
- b. ?[That the water might be dirty], we'll look into -- tomorrow

We can account for the reduced ill-formedness of (45) vs. (44) by assuming that these structures do not involve a CRP violation. Note, however, that in order for the ECP to be satisfied, we must assume that V-P Reanalysis applies in this case.

But now an obvious question arises: why are the sentences in (44b) not on a par with those in (45) by virtue of adjunction to VP, followed by V-P Reanalysis? (Recall that VP-adjunction is the normal strategy of postverbal \bar{S} complements for satisfying the CRP.) Thus the ungrammaticality of (44b) is part of the same problem as the ungrammaticality of (43).

It is doubtful that these facts can be accounted for by blocking the actual operation of the movement rule. It is tempting to invoke a Subjacency account, analogous to that of Baltin (1978) or Van Riemsdijk (1978b), but this is unlikely, unless both PP and VP are bounding nodes, if V-P Reanalysis were possible in this case. If Reanalysis were to apply, the derived verb could both properly govern and assign Case to the trace of NP or \bar{S} , satisfying the θ -criterion, the ECP, and the CRP. So it seems that the key to ruling out (43) and (44b) is to block Reanalysis somehow in the rightward movement cases.

In both the leftward and rightward movement structures, the antecedent is in a non-A-position c-commanding its trace, so the only obvious difference between the two classes of constructions is in terms of the left/right asymmetry. This suggests that Reanalysis is subject to a type of "leftness" condition, reminiscent of the condition on pronominal variables proposed by Chomsky (1976).¹⁸ Specifically, we can adopt the following condition on Reanalysis:

(46) The Antecedent Condition on Reanalysis

A string of words, S , may be reanalyzed so as to form a complex word, W , only if:

- (i) W governs some constituent, α , and
- (ii) there is some antecedent, A , such that A binds α , and
- (iii) A is to the left of W

According to (46), Reanalysis must apply at S-structure, or at least after the application of *Move α* , since the Antecedent Condition is not satisfied at D-structure even in the grammatical stranding constructions involving leftward movement. This raises a problem for the Projection Principle, and may imply that the original (D-structure) configuration exists simultaneously with the reanalyzed structure at the level of S-structure, a possibility noted by N. Chomsky (personal communication).¹⁹

From the perspective of the controversy surrounding involvement of reanalysis in the derivation of the WH-movement stranding constructions, it is significant that the Antecedent Condition treats NP-movement and WH-movement as a natural class, as opposed to the constructions involving rightward movement in (43) and (44b). Taken together with the observations in the preceding discussion of the conditions governing reanalysis, this supports the view that the asymmetries among the various types of stranding constructions can be deduced from the interaction of general principles governing reanalysis, rather than being attributed to the involvement of entirely different rules in each case. Certain serious problems remain unresolved -- in particular, the apparent violations of Condition (22) with respect to PP arguments in WH-movement and Tough-movement constructions -- but in general it seems that the program of reducing all cases of stranding to reanalysis is feasible.

3. Reanalysis in Dutch

3.1 Let us now turn to the Dutch facts which led Van Riemsdijk to adopt the solution of a PP-internal escape hatch for R-pronouns. Recall that Dutch has both prepositions and postpositions, a possibility which we attributed in Chapter 2 to the existence of two head positions in \bar{P} . As it turns out, the postpositions fall into two distinct classes: the "motional" postpositions, which indicate the direction of motion, and the "non-motional" postpositions, which normally indicate static location.²⁰ Van Riemsdijk suggests that the motional postpositions are generated as postpositions at D-structure, while the non-motional Ps originate as prepositions, and become postpositions at S-structure by virtue of a rule of R-movement which applies to their NP objects, deriving (47b) from (47a):

- (47) a. $[_{PP} [e] - P - NP_i]$
 b. $[_{PP} NP_i - P - [e]_i]$

Actually, the only NPs to which R-movement may apply are the R-pronouns, which include *er*, *daar*, and *waar*. Van Riemsdijk handles this by having the base rules for PP specify the pre-head position in (47) as being specifically reserved for pronouns bearing the feature [+R]; this is the R-position alluded to above. Although R-movement is optional, there is a surface filter which rejects any PP in which an R-pronoun follows a governing preposition, thus effectively forcing R-movement to apply in all cases.²¹

Van Riemsdijk suggests that this R-position functions as an escape hatch for the purposes of syntactic movement in two classes of constructions. The first of these is the WH-movement construction in (48), while the second is the R-movement construction in (49):

(48) [Waar]_i heb je het [pp [e]_i mee] gedaan
 Where have you it with done
 'What have you done with it?'

(49) Ik had [er]_i niet [pp [e]_i op] gerekend
 I had there not on counted
 'I had not counted on it'

In (49), the R-pronoun *er* appears at S-structure in a special position that Van Riemsdijk attributes to the Dutch categorial rule defining the structure of S. This position is immediately after the positions reserved for the other "weak pronouns", as noted in Chapter 3 above.

In each case, it is assumed that the PP-internal R-position is a crucial escape hatch for movement out of the PP, thus accounting for the fact that NPs which are not pronouns may not leave stranded prepositions:

(50) a. Zij heeft [pp op hem] gerekend
 she has on him counted
 'She has counted on him'

b. Ik had [pp op jouw vrienden]_i gerekend
 I had on your friends counted
 'I had counted on your friends'

(51) a. *[Wie]_i heeft zij [pp op [e]_i] gerekend ?
 who has she on counted
 'Who has she counted on?'

b. *[Jouw vrienden]_i worden [pp op [e]_i] gerekend
 your friends are on counted
 'Your friends are being counted on'

In order to rule out direct movement from the prepositional object position in (51) -- thus bypassing the R-position -- Van Riemsdijk invokes the Head Constraint, which blocks direct movement from a position within \bar{P} to a position outside of P^{\max} , as in the English sentences in (8). In order for the R-position to function as an escape hatch, it is necessary to assume that this position is dominated by $\bar{\bar{P}}$, so that subsequent movement from this

position will not violate the Head Constraint.

In addition, Van Riemsdijk argues that the R-position in S is an escape hatch with respect to Subjacency in the case of WH-movement.

Consider:

- (52) a. [Waar]_i heeft zij vaak [pp [e]_i over] gesproken
 Where has she often about spoken
 'What has she often spoken about?'
- b. *[Waar]_i heeft zij er vaak [pp [e]_i over] gesproken
 Where has she there often about spoken
 'What has she often spoken about there?'

The story goes as follows. Take PP and S to be bounding nodes for sub-jacency. Movement from the R-position in PP to the R-position in S will be all right, because only PP is crossed; but direct movement to COMP would cross both PP and S. In (52a), it is possible to assume that the WH-pronoun actually moved in two steps, passing through the R-position on its way to COMP; in (52b), however, the R-position is occupied by another R-pronoun, so this position is unavailable. Van Riemsdijk describes the structure in (52b) as an R-island, analogous to the WH-islands discussed by Chomsky (1973).

3.2 In addition to the stranding constructions involving R-pronouns, there are other constructions in which a preposition appears dissociated from its object; these involve the motional postpositions mentioned previously. According to a proposal of Evers (1975), Dutch has a rule of V-raising, which takes a verb out of a subordinate clause and adjoins it to the right of the governing matrix verb. This rule interacts with Verb-Particle constructions, accounting for alternations such as the following:

- (53) a. omdat hij de tandarts op probeerte te bellen
 because he the dentist up tried to call
 'because he tried to call up the dentist'
- b. omdat hij de tandarts -- probeerte op te bellen

In (53a), the particle *op* is left behind when V-raising applies to the subordinate verb *te bellen*; in (53b), the particle moves along with the verb, adjoining to the governing V. Although Koster (1975) argued that particles appear at D-structure as part of the verb, Van Riemsdijk proposes that they are actually incorporated into the structure of the verb by means of a rule of *P-shift*. This allows him to account for the alternation in (53) by assuming that *P-shift* is optional: if it applies, then V-raising yields (53b); if not, then (53a) results.

When a PP complement headed by a motional postposition appears before the verb, *P-shift* is also possible, deriving a V-raising alternation parallel to that in (53):²²

- (54) a. omdat hij de boom in probeert te klimmen
 because he the tree into tries to climb
 'because he tries to climb into the tree'
- b. omdat hij de boom -- probeert in te klimmen

Note that *P-shift* is essentially equivalent to the V-P Reanalysis rule found in English, especially insofar as both languages have Verb-Particle constructions.²³ Given the existence of the *P-shift* rule, one might ask why it was not invoked to derive the stranding configurations in (48) and (49), since this would eliminate the PP structure and make movement possible.

There are several reasons for Van Riemsdijk's reluctance to make this move. First, *P-shift* can apply regardless of the status of the object of the postposition (cf. 54b), but the WH-movement cases discussed previously were limited to R-pronouns. Second, *P-shift* can only apply to motional

postpositions, and cannot apply to underlying prepositions which become postpositions by virtue of R-movement. This is indicated by the fact that non-motional postpositions are always left behind by V-raising:

- (55) a. omdat hij [er op] wilde wachten
 because he there for wanted to wait
 'because he wanted to wait for it'
- b. *omdat hij er -- wilde op wachten

If P-shift cannot apply to these postpositions, then an independent explanation is required for the fact that they can be stranded by R-movement and WH-movement. A third reason for not extending the P-shift rule to cover all of the stranding constructions is that it would be impossible to derive the R-island effects in this system without the assumption that direct movement to COMP is blocked by virtue of the bounding status of the intervening PP and S nodes. Van Riemsdijk's account succeeds in limiting the V-raising constructions to the right set of postpositions; moreover, by making stranding with the other postpositions crucially dependent on the escape hatch within PP, he succeeds in limiting extraction to R-pronouns, while simultaneously making possible a simple and straightforward account of the R-island phenomena.

3.3 Despite these advantages, there are grounds for discomfort with the overall structure of this theory. First, there are certain technical problems. As with the PP-internal COMP analysis for English, the use of the R-position escape hatch is incompatible with Kayne's proposal that prepositions are not proper governors, if government is only from head position.²⁴ Moreover, as Koster (1978b) observes, the Head Constraint and Subjacency together overdetermine the facts in the case of movement to COMP by anything other than an R-pronoun. In addition, in order to make the R-position immune to the effects of the Head Constraint, Van Riemsdijk must place this position in \bar{P} ; but this forces him to assume that subcategorized

constituents appear at the \bar{X} level, since he distinguishes prepositions in terms of whether or not they subcategorize for an R-position. Quite apart from the fact that this weakens the theory of subcategorization, it reduces the plausibility of the Head Constraint as a condition on movement of subcategorized complements.²⁵

Van Riemsdijk's analysis also relies crucially on the assumption that the categorial rules of Dutch define certain NP positions within the expansions of S and PP as being reserved specifically for R-pronouns. The rules deriving these positions would have to be category-specific, since the R-positions do not appear in the expansions of other categories. In fact, the R-position in S appears to be a clitic position, rather than a real phrase structure position per se, as suggested by its fixed location and categorial asymmetry. It appears immediately adjacent to the other pronominal clitics, and in fact may intervene between a direct object NP and the \bar{V} -initial head position, creating superficial violations of the adjacency condition on Case assignment in terms of the theory of Dutch verbs developed in Chapter 3. Moreover, the R-position is involved in partitive clitic constructions that are directly analogous to clitic constructions in French and Italian:²⁶

- (56) a. Ik [heb er] nog drie --
 I have there still three
 'I still have three (of them)'
- b. Hij [heeft er] van Jan ook een paar -- gekocht
 he has there from Jan also a pair bought
 'He has also bought a few from Jan'

But if the R-position is really a clitic position, then it cannot be subject to syntactic movement rules, and in particular cannot be an escape hatch for the purposes of WH-movement.

Finally, the fact that Van Riemsdijk's analysis requires two distinct and unrelated strategies for deriving stranding constructions is itself dissatisfying, as noted previously. It is especially striking that Dutch -- like English -- has Verb-Particle constructions. These can plausibly be supposed to involve complex verbs formed by the word-formation component, parallel to the English case. The internal structure of the complex verb in this construction is exactly what would be required to satisfy Condition (22) if the Dutch stranding constructions were all due to Reanalysis. Moreover, even in the stranding constructions involving extraction of R-pronouns, the internal structure of the PP is postpositional, which is just what would be required for Reanalysis to proceed. In Van Riemsdijk's account, it is a coincidence that the PP-internal escape hatch happens to precede the head of \bar{P} , but this would be a necessary precondition if Reanalysis were involved. Finally, in all stranding constructions, the stranded postposition is adjacent to the verb at the relevant level of representation.²⁷

These considerations suggest that it may be worthwhile reconsidering the Dutch facts to see if all of the stranding constructions might be accounted for in terms of Reanalysis, after all. Recall that there are three basic properties that must be accounted for:

- (57)
- i. Even though any postposition may be stranded when an R-pronoun is dissociated from the PP, only motional postpositions may move along with the verb in V-raising constructions.
 - ii. Only R-pronouns can escape from PPs that are not headed by motional postpositions; moreover, no pronoun other than an R-pronoun may appear in the R-position.
 - iii. The R-position in S appears to behave like an escape hatch: when it is filled by some other element, stranding via WH-movement of an R-pronoun is blocked.

3.4 Let us first consider (57i). In Van Riemsdijk's account, the inability of the non-motional postpositions to move along with the verb in V-raising constructions follows from the fact that P-shift (i.e. P-V reanalysis) is unable to apply to these "surface" postpositions. If we are to invoke Reanalysis in order to account for extraction of R-pronouns from non-motional PPs, then this solution is unavailable to us. Instead, we must find some other way to distinguish between the two classes of postpositions for the purposes of V-Raising.

Recall that particles may also move along with the verb in V-raising constructions, as in (53). Significantly, however, true intransitive prepositions may never move along with a governing verb in the same way. This is shown strikingly by the contrast between (58) and (59):

- (58) a. omdat hij voor schijnt te staan
 because he in front seems to stand
 'because it seems to be leading'
- b. omdat hij -- schijnt voor te staan
- (59) a. omdat hij voor schijnt te staan
 'because it seems to be standing in front'
- b. *omdat hij -- schijnt voor te staan

The sentences in (58) and (59) have identical strings of words; but (58) is a Verb-Particle construction with an idiomatic meaning (roughly, 'to lead', as in a sports match), while (59) simply has the literal reading of an intransitive verb occurring with a locative (intransitive) preposition. Only in the case of the idiomatic reading can the particle and verb function as a unit for V-raising. Van Riemsdijk suggests that this is due to a condition on P-shift preventing it from applying to intransitive prepositions. Recall, however, that his P-shift rule must apply to motional postpositions in order to derive the construction in (54b). This means that the P-shift

rule must treat particles and motional postpositions within a PP as a natural class, as opposed to intransitive prepositions and non-motional postpositions; needless to say, this is hardly a natural cut.

Suppose instead that the relevant difference between particles and intransitive prepositions is that particles originate within the structure of the complex verb at D-structure, as originally suggested by Koster (1975). Then the Verb-Particle combinations are derived by means of a word-formation rule of Particle Incorporation, just as in English. Suppose further that the verbal complex in a V-raising construction is also derived by means of a word-formation rule, analogous to the rules deriving the complex of the verb and its auxiliaries in English, Dutch and the Romance languages. It would then follow that even if a preposition could be reanalyzed as part of a complex verb by a syntactic reanalysis rule, it would be "too late" for the preposition to "move" along with the verb in V-raising constructions. Thus we would take V-raising to be a diagnostic for the involvement of a word-formation rule, rather than as a diagnostic for Reanalysis.

We could then account for the fact that motional postpositions are subject to V-raising by assuming that they too may be adjoined to a verbal stem by the relevant word-formation rule of Particle Incorporation.

It might be objected that it misses a significant generalization with respect to strict subcategorization if there are two possible sources for motional postpositions. But this objection could be answered if PP subcategorization frames could be satisfied either by an incorporated postposition or by a true PP.²⁸

In fact there is independent evidence for the claim that V-raising is not a cyclic syntactic rule as originally proposed by Evers (1975).

Riemsdijk (1978b) observes that if P-shift "feeds" V-raising (as it does in his account) then it should be impossible to "dangle" a particle between two higher verbs when V-raising applies successive-cyclically:

- (60) a. *omdat [[[ik de boerderij later over nemen] te-kunnen] schein]
 because I the farm later over take to be able seem
 b. *omdat [[ik [de boerderij later over] te-kunnen-nemen] schein]
 c. omdat [ik [[de boerderij later over]] schein-[te-kunnen-nemen]]
 d. omdat [ik [[de boerderij later]] schein-[te-kunnen-[over-nemen]]]
 e. %omdat [ik [[de boerderij later]] schein-[over-te-kunnen-nemen]]]

Sentence (60a) is the D-structure representation prior to the application of any syntactic rules, according to a movement analysis of V-raising.

(60b) is the representation after the second cycle, where *nemen* has moved over to the right of the governing verb. (60c) is the grammatical S-structure in which *te-kunnen-nemen* has moved up around the matrix verb. (60d) is the counterpart to (60c), where P-shift has occurred on the first cycle, and *over-nemen* has functioned as a unit for subsequent successive-cyclic application of V-raising. (60e) is the structure that shouldn't exist. Presumably, it would be derived from (60b) by illegally applying P-shift after V-raising has already applied to the bare verbal stem, with subsequent application of V-raising to the entire complex. However, Van Riemsdijk notes that structures such as (60e) are attested in some southern dialects, even though they are ungrammatical in Standard Dutch. This is just the kind of arbitrary dialect variation that we would expect to find if the verbal complex in V-raising constructions were actually derived by means of a word-formation rule, rather than by cyclic application of syntactic movement.

3.5 Let us now consider (57ii):

- (57) ii. Only R-pronouns can escape from PPs that are not headed by motional postpositions; moreover, no pronoun other than an R-pronoun may appear in the R-position.

It is clear that the first aspect of this observation follows straightforwardly from the assumption that all stranding constructions are derived via P-V Reanalysis. Since only R-pronouns may precede the non-motional postpositions in PP, it is only with R-pronouns that the postpositional head of PP is adjacent to the verb. In constructions where the preposition precedes its object, the trace of the NP extracted by WH-movement intervenes between the stranded preposition and the following verb. Therefore, P-V Reanalysis would be blocked in these structures, since the adjacency requirement (22i) would be violated. Moreover, the trace of WH-movement would appear inside a word, so the WH-operator would be unable to bind a variable in any A-position. Thus it seems that the limitation of stranding to constructions involving extraction of R-pronouns follows automatically if Reanalysis is necessarily involved.

But this still leaves open the question of why it should be that R-pronouns may never follow a preposition, and must always precede the head P when they appear in PP. To resolve this issue, we must consider the internal structure of the Dutch PP in greater detail. Recall that we objected to Van Riemsdijk's structure on two grounds: first, it required the base rules to explicitly reserve a position for R-pronouns within PP; second, it allowed strict subcategorization frames to "reach" into the \bar{X} level, so as to allow certain Ps (but not others) to select an empty R-position for the R-pronoun to move into. Suppose that these options are not made

available by linguistic theory. How then could the effect of "obligatory R-movement" be achieved?²⁹

Recall that the structure of the Dutch \bar{X} level allows for two head positions in \bar{P} . Suppose now that every preposition or postposition must occur in one of these head positions, and that all complements must appear within \bar{P} . Then every PP would have (roughly) the structure in (61):

(61) $[\bar{P} \ P \ \dots \ P]$

Prepositions would always appear in the \bar{P} -initial head position, while postpositions would appear in the \bar{P} -final position. All complements (including R-pronouns) would have to appear in between. This means that a non-motional postposition would appear in the \bar{P} -final position only when it takes an R-pronoun object, while a motional postposition would appear in the \bar{P} -final position regardless of the status of its object. Suppose this is correct. What could possibly be responsible for forcing these unusual patterns of distribution on the various types of prepositions? It seems that the relevant lexical properties determining these facts may relate to Case assignment in some way.

Recall that Dutch verbs have two important properties which relate directly to Case assignment. The first property is that they assign Case to the right; this accounts for the fact that the position of objective Case assignment in \bar{V} is the position immediately to the right of the \bar{V} -initial head position. Suppose that the same is true of prepositions; i.e. that they assign Case to the right. This would account for the fact that regular prepositions (i.e. non-motional Ps) must always occur in the \bar{V} -initial head position when they take an NP object other than an R-pronoun;

otherwise, they would not be able to assign Case to the NP, and θ -role assignment would be blocked.

The second important property of Dutch verbs is that the verbal complex is discontinuous, and is able to simultaneously occupy both head positions, even when one of these positions is phonologically null. Therefore even when a verb appears in the \bar{V} -final position (as is typical in subordinate clauses) it is able to assign Case from the head position at the beginning of \bar{V} . We can now account for the distinctive behavior of motional postpositions by assuming that they share with verbs the property of having a discontinuous complex.³⁰ Thus the motional postpositions would be able to assign Case from the \bar{P} -initial head position even when the phonological preposition actually appears in the \bar{P} -final position. The fundamental distinction between "regular" prepositions and motional postpositions is that only the latter have the verb-like property of discontinuous structure.

Let us now consider the status of R-pronoun objects. Van Riemsdijk observes that the R-pronouns not only function as PRO-NPs, but also as PRO-PPs. This suggests that these pronouns are inherently marked for Case. It would then follow that when a preposition takes an R-pronoun as its object, it need not occur in the \bar{P} -initial head position, since it doesn't have to assign Case to the inherently Case-marked R-pronoun. This explains why an R-pronoun may always precede its governing head P, except in a few exceptional cases.³¹ However, we must make an even stronger distinction between R-pronouns and other NPs in this respect, since an R-pronoun must precede the governing head P. Suppose that prepositions assign Case according to the following general principle:

- (62) If a preposition subcategorizes for an NP object, then it must always assign Case to that NP, if the NP appears in a position of Case assignment.

If a preposition subcategorizes for an NP object appearing to its right, then it will be forced by (62) to assign Case to the NP, even if it is an R-pronoun. But R-pronouns are already inherently Case-marked, so the assignment of an additional Case would result in Case conflict. It therefore follows that if a preposition takes an R-pronoun object, it must appear in the \bar{P} -final head position, so that Case assignment is blocked.³²

Recall, however, that motional postpositions are able to assign Case from the \bar{P} -initial position, even when they appear phonologically in the \bar{P} -final position. Given (62), we might expect R-pronouns to be completely incompatible with these postpositions; but this is not the case. The solution here is to assume that each head position is optional. When a PP is headed by a regular preposition, the \bar{P} -final slot is left empty, while the \bar{P} -initial slot is optionally left empty when a PP is headed by a postposition. If the postposition is a motional postposition, and if its object is a regular NP, then the \bar{P} -initial position will appear, so as to allow Case assignment to proceed. But if the NP object is an R-pronoun, then the \bar{P} -initial position will simply not exist, and Case assignment will be impossible, thus circumventing (62) and avoiding Case conflict. Notice, incidentally, that when a preposition takes a PP complement, (62) is simply irrelevant, and so the PP complement may follow the preposition, without causing a CRP violation.³³

This account of the distribution of R-pronouns in PP has some interesting consequences. First, there is no longer a single R-position per se;

instead, an R-pronoun may appear anywhere in \bar{P} preceding the \bar{P} -final head. This is a desirable result, since Van Riemsdijk was forced to posit two distinct R-positions in order to account for variations such as those in (63):

- (63) a. [pp 10m daar achter]
 b. [pp daar 10m achter]
 'ten meters behind there'

Second, it is possible to dispense with Van Riemsdijk's filter which rejects PPs containing a preposition followed by an R-pronoun; its effects now follow from the general prohibition against Case conflict, given Principle (62). Finally, the rule of R-movement is no longer required in order to account for the location of R-pronouns within PP. Furthermore, if the R-position within S is actually a clitic position, then syntactic movement to this position is also ruled out. This means that the rule of R-movement does not exist. This is also a fortunate result, since the rule overgenerates in a number of cases; we will provide an illustrative example here.

Dutch has a construction which Van Riemsdijk (1978b) describes as an "absolute" PP construction, governed by the preposition *met* 'with'. As he has pointed out to me, there is a very straightforward analysis of these constructions, if we assume that *met* takes a small clause complement:

- (64) a. [met [de tafel [er naast]]]
 with the table there beside
 'with the table next to it,...'
 b. [met [de helft van de ploeg [dronken]]]
 with the half of the team drunk
 'with half of the team drunk,...'

We have already observed that small clauses are not barriers to government from a governing head; in fact trace can appear in the subject position of a small clause, as in the raising constructions such as *Jonn seems sad*.

Nevertheless, R-movement can never take a small-clause subject around a governing preposition:

- (65) * $[[er]_i \text{ met } [e]_i [er \text{ naast }]]]$
 there with there beside
 'with it_i next to it_j '

In a theory containing a rule of R-movement, this is a mysterious fact, as Van Riemsdijk observes. But in our terms, it makes perfect sense. We derive the pre-prepositional placement of R-pronouns by placing the P in the \bar{P} -final head position, rather than by allowing the R-pronoun to raise into \bar{P} . This means that the only place where the complements of a preposition may appear is between the two head positions in (61). But in (65), the small clause complement is spread over both sides of the head P, and so the string cannot be analyzed as a well-formed X-bar structure.

In addition, there are other examples directly parallel to (65), in which the governing preposition takes a PP complement in place of a small clause. Although it is possible to block R-movement by means of certain complications in strict subcategorization frames, these devices are suspect from the perspective of the theory of acquisition.³⁴ On the other hand, if an R-pronoun may only precede a \bar{P} -final postposition, then the ungrammatical "raising" constructions are ruled out in principle.

3.6 Let us now turn our attention to the R-island effects in (57iii). This phenomenon appears to argue strongly in favor of viewing the R-position in S as a genuine syntactic constituent which is analyzable by Move α . But this is impossible if the R-position is actually a clitic within the structure of the verbal complex in the \bar{V} -initial head position. How then can the escape-hatch effect, observable in the contrast between (52a) and (52b) be explained?

If stranding is dependent upon Reanalysis, the actual S-structure representations of these sentences will be those of (66):

- (66) a. *Waar_i heeft zij [_V -- [er]] vaak [e]_i [_V over - gesproken]
 b. Waar_i heeft zij [_V --] vaak [e]_i [_V over - gesproken]

If we consider the discontinuous verbal complex as a syntactic unit, then the complex verb in (66) contains both an incorporated preposition (*over*) and an incorporated NP (*er*). This recalls the structure of the verbal complex in the ungrammatical extraction example in (67), which we discussed in Chapter 5:

- (67) *What_i did the board [send - the members - out] [e]_i

I suggested there that complex verbs which contain incorporated NPs and particles do not properly govern an NP position other than the one linked to the incorporated NP. When the incorporated NP is eliminated, the sentence is fine:

- (68) What_i did the board [send - out] [e]_i

The parallel between the pattern in the Dutch sentences and the English sentences in (67-68) suggests that the same principle is at work in each case. Note that the escape-hatch story would be unable to account for the English example, since the incorporated NP position is not subject to WH-movement, as observed in Chapter 5. Perhaps, then, a condition based on the derived structure of the verbal complex in (66) is the appropriate basis for deriving the R-island effect. Although there are certain problems that arise in deriving the correct range of empirical coverage, this approach seems to be worth pursuing.³⁵

This kind of account actually represents an improvement over the

escape-hatch theory for another reason. Recall that the R-position in S is needed as stepping stone for WH-movement only for NPs which are escaping from PP. Van Riemsdijk notes that (66a) is actually grammatical if *waar* is taken to be a matrix NP and the clitic *er* corresponds to the position within PP. In our terms, the grammatical S-structure would be (69):³⁶

- (69) [Waar] heeft zij [_V -- er_i] vaak [e]_i [_V over - gesproken]]
 'Where has she often spoken about it?' (cf. 52b)

Unlike the structure in (66a), this structure is not comparable to the ungrammatical English sentence in (67); instead, it corresponds to (70):

- (70) Where did Kevin [_V -- turn - the light_i - on] [e]_i]

In (69) and (70), the incorporated NP corresponds to the trace position that has to be governed by the complex verb, and proper government holds.

But now consider the following examples:³⁷

- (71) a. Zij probeert (er) op blote voeten er in te klimmen
 She tries there in bare feet there in to climb
 'She tries to climb in(to) it there in bare feet'
 b. [Waar]_i probeert zij op blote voeten [e]_i in te klimmen
 Where tries she in bare feet in to climb
 'What does she try to climb in bare feet?'
 c. *[Waar]_i probeert zij er op blote voeten [e]_i in te klimmen
 Where tries she there in bare feet in to climb
 'What does she try to climb into in bare feet there?'

In terms of our analysis, the S-structure of (71c) is (72):

- (72) [Waar]_i probeert zij [_V -- er] op blote voeten [e]_i [_V in-te-klimmen]

This structure is ungrammatical for the same reason that (66a) is; the complex verb is unable to properly govern the WH-trace, since it has a distinct index from that of the clitic *er*. Notice, however, that in the escape-hatch theory, the explanation for this case is not so obvious.

Unlike the non-motional postposition *over* in (66), the postposition *in* in (71) is a true motional postposition. Therefore it should be subject to P-shift, thus eliminating the relevant PP structure. But now WH-movement ought to be able to proceed in one step, as in (69), bypassing the R-position entirely. In other words, in any analysis which allows for both P-shift and a PP-internal escape hatch, it is necessary to provide an auxiliary stipulation to rule out (72), since the R-position in S should be irrelevant. Whatever the ultimate explanation for these R-island facts, it would be desirable to account for them as a unitary phenomenon, unless the parallel could convincingly be shown to be a false analogy.

4. This concludes our discussion of Reanalysis rules. We have seen that the word-formation rules responsible for the English Double Object and Verb-Particle constructions provide the basis for a possible explanation of the distribution of preposition stranding constructions in various languages. By invoking Kayne's (1981) suggestion that prepositions are not proper governors to force V-P Reanalysis in stranding constructions, we forced all stranding constructions to be dependent upon Reanalysis. Moreover, by assuming that Reanalysis is constrained by the Structure-Preserving Condition and the Antecedent Condition (46), we were able to account for a number of superficially unrelated facts, including the distribution of stranding constructions in English and other languages, certain apparent violations of the Complex NP Constraint in English, and the inability of prepositions to take tensed clause complements. The abstract conditions on Reanalysis are of interest precisely because they provide the basis for explaining the special properties of these constructions in English in the same terms that the cross-linguistic differences in the various constructions are accounted for.

FOOTNOTES: CHAPTER SEVEN

1. Preposition stranding is also attested in other Germanic languages, including Norwegian. In this chapter I will concentrate almost exclusively on Dutch and English, primarily because these are the languages that have been extensively documented with respect to stranding.
2. Presumably a number of factors cause deviations from the norm of cross-categorial symmetry. The English word-formation rules deriving prenominal adjectival complexes and the Dutch rules deriving the discontinuous verbal complex are two examples of this.
3. An alternative to Kayne's assumption that prepositions are not proper governors is due to Weinberg and Hornstein (1981). They suggest that there is a surface filter which rejects empty categories (traces) with oblique Case. Under the assumption that prepositions assign oblique Case, it follows that V-P Reanalysis is necessary in order for stranding to be possible. (One problem with this approach is that oblique Case-marked NPs are freely subject to WH-movement in languages such as German.) We will continue to assume Kayne's proposal -- in part because it is possible to derive it from the principles of θ -role assignment developed in Chapter 6.
4. In their analysis of preposition stranding, Weinberg and Hornstein (1981) attribute the contrast between (7) and (8) to a condition on the rule of predication which links subject and predicate in passive sentences. Specifically, they suggest that the reanalyzed passive participle must form a "possible semantic word", because "only predicates which are also semantic words may be related to arguments" (p.65). They define a possible semantic

word as (a) being noncompositional, and (b) containing no subparts which have independent reference. A referring noun phrase may not be included in a semantic word, since it would violate both criteria. On the other hand, a preposition can be included, according to their account, because it is nonreferential and presumably does not contribute enough to the meaning of the complex verb to make the derived meaning count as compositional.

Although the notion of "possible semantic word" may have some value in a theory of semantics, its applicability in this fashion to constrain predication seems dubious at best. For instance, the predicates in (i-iii) are compositional, and in (ii) and (iii) they contain referring noun phrases:

- (i) The sweater is [moth-eaten]
- (ii) John is [smarter than Bill]
- (iii) Kevin is [eager to help his sister]

It is far from clear how Weinberg's and Hornstein's condition could rule out the stranding examples in (8) without simultaneously ruling out (i-iii).

5. Baltin (1978) independently argues for the bounding status of PP with respect to the Subjacency condition. Rizzi (1978b) argues that the bounding status of S and \bar{S} may be parametrized. This does not necessarily contradict Van Riemsdijk's assumption that the bounding status of PP is invariant, however.

6. The Structure-Preserving Condition on Reanalysis is obviously within the spirit of Emonds's (1970) condition on non-root transformations. At a technical level, (22) differs from Emond's condition in that it applies not to syntactic movement rules but rather to string reanalyses, constraining them in terms of the output of the word-formation component, rather than in terms of the base rules.

7. Actually, Particle Incorporation also extends to *ing*-nominals:

- (i) [Kevin's sudden [turning-on] of the light]
- (ii) [Janice's careless [cutting-up] of the cabbage]

For some reason, *ing*-nominals are always active, perhaps because they are strictly agentive:

- (iii) *[the bed's making -- (by John)]
- (iv) *[the chicken's cooking -- (by Debbie)]
- (v) *[the light's turning on --]

Thus pseudopassives are ruled out in principle in this environment, given (22):

- (vi) *[the garden's walking through --]
- (vii) *[the table's sitting on --]

8. There is a "squish" of acceptability of extraction from NPs if this type:

- (i) Who did you read a book about?
- (ii) ?Who did you read the book about?
- (iii) *Who did you read John's book about?

This seems to be due to independent factors relating to definiteness, and may at some level be analogous to the effects of the finite complementizer *that*. See Pesetsky (1978) for some discussion.

9. The contrast between the cases of extraction from PP modifiers and the VP modifier in (29) is significant, since VP is not normally an island:

- (i) Who did John begin kissing -- ?
- (ii) Who does Bill disapprove of John kissing -- ?

10. The link between unbounded Tough-movement constructions and the possibility of Reanalysis deserves some comment. In Chomsky (1977), the possibility of unbounded movement is attributed to the fact that WH-movement is crucially involved in the construction. The idea is that all applications of syntactic movement are subject to the Subjacency condition, and so apparent violations of the principle must involve successive-cyclic movement through the "escape hatch" in COMP. In fact, there is independent evidence for this assumption, since the Tough-movement construction shows the characteristic diagnostics of movement through COMP, in the form of the island effects discussed in Ross (1967), Chomsky (1973), and elsewhere.

On the other hand, certain problems persist. First, Van Riemsdijk (1978a) argues that the Tough-movement construction in Dutch is crucially dependent upon WH-movement; but he observes that the construction is still strictly bounded, unlike relative clause construction and other instances of WH-movement. This suggests that the involvement of WH-movement may be a necessary precondition for unbounded movement while still being insufficient to guarantee it. A second problem is that the English constructions show certain apparent violations of the WH-island effects of Subjacency, where a WH-phrase may be extracted from a position following the Tough-movement trace in VP:

- (i) [Which violins]_i are [these sonatas]_j easy to play [e]_j on [e]_i ?

This is normally impossible in other constructions involving WH-movement.

A possible solution to the second problem is suggested by Chomsky (1981). Specifically, he suggests that a rule of Reanalysis is also involved in the construction, such that the material preceding the trace in the clausal complement to the *tough*-adjective is realized as part of the adjective itself:

(ii) [Which violins]_i are [these sonatas]_j [_{AP} [_A easy - to play [e]_j on [e]_i]

Reanalysis leaves the second trace [e]_i outside of the WH-island, so that Subjacency is not really violated in structures such as (ii). One might wonder how the child knows that Reanalysis is involved here, since sentences such as (ii) are presumably not part of the primary linguistic data. Chomsky suggests that the involvement of Reanalysis can be deduced from the θ -criterion. Specifically, the matrix subject NP in the Tough-movement construction appears in a non- θ -position at S-structure. Therefore in order to satisfy the θ -criterion, it must be part of an A-chain which also includes a trace in a θ -position. The relevant θ -position is the WH-trace [e]_j in (ii). But in order for the matrix subject and the trace to constitute a well-formed A-chain, the S-structure representation must simulate the output of normal NP-movement. Effectively, this means that the trace must not be assigned Case, and must be locally A-bound by the matrix subject. This is where Reanalysis comes in: the material preceding the trace in the clausal complement is reanalyzed as part of the adjective, so that (a) the trace is governed by a complex adjective at S-structure and therefore is not assigned Case, and (b) the governing category of the trace is the matrix clause, so that the trace is locally A-bound by the matrix subject. Since the subject position of AP is not obligatory if no θ -role is assigned to the subject position, APs which are headed by *tough*-adjectives are not governing categories like those discussed in Chapter 4. Thus Reanalysis is crucial for permitting unbounded Tough-movement constructions, since it is only by virtue of Reanalysis that the trace position can be locally A-bound from subject position. Since local A-binding is a necessary condition for a well-formed A-chain, Reanalysis is indirectly responsible for unbounded movement -- thanks to the θ -criterion. (See also footnote 12 for a brief

discussion of Tough-movement constructions that do not involve Reanalysis.

11. Koster and May (to appear) argue that all instances of *to*-infinitives in English have the categorial status of S. This is implied by the assumption that *to* is an instance of INFL -- which is the head of S, as observed in Chapter 1.

12. This still leaves open the question of the status of Tough-movement in languages which do not have the A-S Reanalysis rule. In these languages, the θ -criterion must also be satisfied by means of including the matrix subject position in a well-formed A-chain at S-structure. This chain will also include the "gap" in the complement to the *tough*-adjective. The gap must be formed by WH-movement; if it were formed by NP-movement, then the θ -criterion would be violated at S-structure, since the NP-trace in the θ -position would have to be included in two distinct A-chains. Thus even in a language such as Dutch, WH-movement will be crucially involved in the construction, a result which coincides with the findings of Van Riemsdijk (1978a). But Dutch lacks a word-formation rule equivalent to the English one. So Reanalysis will be blocked, and the Dutch Tough-movement construction is consequently strictly bounded, as we expect. Two problems persist, however, as a result of the requirement to form an A-chain at S-structure to satisfy the θ -criterion with respect to the matrix subject.

First, the trace must not be assigned Case at S-structure, or else the A-chain would be assigned Case twice, which is not generally permitted; see Chomsky (1981) for discussion of this point. Under a Reanalysis story, the Absorption of the Case-assigning properties of the governing verb can be attributed to the Reanalysis rule. How, then, does a language such as Dutch, French, or Spanish avoid assigning Case to the trace at S-structure? One

possibility is that verbs assign Case optionally, as required by the θ -criterion and the "visibility" condition discussed in Chapter 3. This would not cause problems in allowing illegitimate passive-like N^0 movement with active verbs, since active verbs assign a θ -role to subject position, and the θ -criterion prevents movement to a θ -position, as observed by Borer (1979). Alternatively, we could simply stipulate that a verb within the domain of a *tough*-adjective has its Case-assignment properties absorbed.

A second problem is that the PRO subject of the infinitival complement to the *tough*-adjective ought to count as an accessible subject for the purposes of defining the binding category of the trace. (See Chomsky, 1981, and Chapter 3, footnote 29 for the definition of binding category.) But this would mean that the trace couldn't be A-bound in its governing category, in violation of the condition on anaphors in the Binding Theory, which is incorporated into the definition of A-chain. (This problem does not arise in the Reanalysis account, since the binding category of the trace is the matrix clause.) There are two possible ways out of this. First, we might assume that the PRO does not count as an accessible subject by virtue of the WH-trace in COMP. Recall that \bar{S} gets rid of its r-index from the position in COMP. We might then assume that the PRO subject cannot be potentially co-indexed with either COMP or the trace position without violating the well-formedness condition that prevents a non-head constituent from being co-indexed with the category immediately containing it. This would prevent the PRO from counting as an accessible subject for the purposes of defining the clausal complement to the adjective as the binding domain of the trace, given the definition of binding category proposed by Chomsky (1981). (See also Chapter 3, footnote 29.)

Given these revisions, we now have a straightforward account of Tough-movement constructions. In all languages, the matrix subject position is a non- θ position, and must be part of an A-chain which also includes a trace

position in the clausal complement to the *tough*-adjective. This trace must be derived by WH-movement because of the θ -criterion, as noted previously. If WH may only appear at S-structure in a [+WH] COMP, it follows that WH-movement must take the WH-phrase to the COMP governed by the Tough-adjective, which must subcategorize for the [+WH] COMP. This derives the island effects in English. Despite the fact that WH-movement is crucially involved in all Tough-movement constructions, the matrix subject and the trace must form an A-chain at S-structure, so the potential for an unbounded dependency by virtue of successive-cyclic WH-movement is frustrated by the requirement for local A-binding between the matrix subject and the trace. The one exception to the general pattern will be English, by virtue of its peculiar word-formation rule deriving the prenominal complex *tough*-adjectives, which allows A-S Reanalysis to satisfy the Structure-Preserving condition (22).

13. Fiengo (1977) points out a contrast which illustrates the relevance of the "logical object" condition rather nicely:

- (i) *That number is equalled by this fraction
- (ii) Richard's goal-scoring record has been equalled by Potvin

In (i), the number is not even remotely affected by the fact that it is "equalled" by the fraction; *equal* in this sense is not logically transitive, but rather copular in status. On the other hand, Richard's record in (ii) is clearly affected by virtue of being equalled, and so the passive structure is acceptable. See also Davidson (1980) for an interesting discussion of related issues.

14. Van Riemsdijk cites the contrast between (37a) and (i) as a reason for

assuming that only pseudopassive stranding constructions are dependent on Reanalysis:

- (1) Whose mother did John travel with -- ?

But as Weinberg and Hornstein (1981) observe, the contrast need not be attributed to Reanalysis per se; the contrast evident in (36) suggests that the relevant distinction may simply follow from the fact that the conditions on passive predicates are simply more stringent than those governing active predicates.

15. Our use of the Argument Projection to allow for reanalysis of terms that are nonadjacent in the S-structure string is essentially analogous to the use of thematic indexing in the account of French causatives in Rouveret and Vergnaud (1980).

16. Tarald Taraldsen informs me that prepositions may take \bar{S} objects in Norwegian, which appears to be inconsistent with our account. It may be, however, that the preposition in this structure actually appears as a kind of complementizer in the first of the two COMP positions which Norwegian apparently allows. (See Taraldsen, 1979, for a discussion of the internal structure of the COMP in Norwegian.)

17. The topicalized \bar{S} objects of these prepositions are somewhat marginal, although they seem to be somewhat better than the comparable examples in (44b). We can quite reasonably attribute their marginality to the fact that Topicalization is the only structure that will allow an \bar{S} to appear as the object of a preposition at D-structure. Since Topic constructions are stylistically marked, the relevant D-structure configurations could only appear very rarely in actual speech, and all the examples should sound somewhat odd. The very fact that the

sentences of (45) are even marginally acceptable in this situation suggests that the role of strict subcategorization is virtually nil in determining the categorial status of the object of a preposition. This is just what we might expect, if prepositions do not actually assign θ -roles in the same way that verbs do, by means of linking A-positions to slots in a thematic grid. (But see footnote 32.)

18. This condition is intended to account for apparent instances of obligatory disjoint reference in configurations where c-command is apparently irrelevant. See Higginbotham (1980) for an extensive discussion of this condition.

19. Recall that the Projection Principle effectively requires that the thematic complement structure of each verb appear at S-structure, D-structure, and LF. But if Reanalysis destroys the hierarchical organization which appears at D-structure, then the Projection Principle would be violated. (The possibility of distinct coexisting hierarchical structures is implied by the theory of phrase structure proposed by Lasnik and Kupin, 1978.)

Although this is an appealing solution to the problem posed by Reanalysis, it is worth recalling that the object of the reanalyzed verb must be integrated into its thematic structure, suggesting that the reanalyzed S-structure is also mapped to LF. Notice, however, that the reanalyzed structure is not directly subcategorized for, so the Projection Principle and the theory of strict subcategorization would not force it to appear at D-structure.

20. Van Riemsdijk observes that this characterization is far from absolute. For instance, some Ps that have a "motional" meaning may appear

only as prepositions (he cites *naar* 'to' as an example); others, such as *vandaan* 'from', only appear as postpositions. Most motional postpositions, however, are free to appear either as prepositions or postpositions with full NP objects, albeit with very subtle semantic distinctions relating to perfectivity.

21. Within PP, only [+Human] pronouns may appear as non-R-pronouns as the object of a true preposition. All the [-Human] pronouns are subject to obligatory suppletion by the R-pronoun forms, which appear with postpositional heads.

22. We will suggest below that Koster's analysis is to be preferred, given a reconception of the status of stranding and V-raising.

23. Van Riemsdijk arrives at an analogous conclusion: he suggests that P-shift is a structure-preserving syntactic movement rule, in the sense of Emonds (1970). But the rule can only be conceived of as structure-preserving if transformational rules are allowed to analyze the substructure of a word, as Van Riemsdijk himself observes. Note that if P-shift were really a Reanalysis rule equivalent to its English counterpart, this raises no problem. (Actually, I will suggest below that the incorporated postpositions which undergo V-raising are actually adjoined to the verbal stems by means of a word-formation rule, while the P-shift reanalysis rule will be extended to the "surface" postpositions.)

24. Van Riemsdijk's solution is equally incompatible with the oblique trace filter proposed by Weinberg and Hornstein (1981), if this substitutes for the assumption that prepositions are not proper governors.

25. For a different view of the domain of strict subcategorization, see Borer (1981), who argues that subcategorized constituents must be permitted to appear at the \bar{X} level in Modern Hebrew.

26. See Belletti and Rizzi (1980) for a discussion of the analogous *ne-cliticization* construction in Italian.

27. Koster (1978b) observes that stranding of a preposition is only possible when no subcategorized argument intervenes between the PP and the verb:

- (i) a. Hij heeft daar mee een prijs gewonnen
 he has there with a prize won
 'He won a prize with that'
- b. Hij heeft een prijs daar mee gewonnen
- (ii) a. *Waar heeft hij -- mee een prijs gewonnen
 'What sis he win a prize with?'
- b. Waar heeft hij een prijs -- mee gewonnen?

The distinction between the two extraction cases follows immediately from the assumption that the WH-movement stranding constructions are derived by means of Reanalysis, given the Structure-Preserving Condition (22).

28. Van Riemsdijk (1978b) raises the objection of missing generalizations with respect to strict subcategorization. It may be that these incorporated postpositions are analogous at some level to clitics and other incorporated NPs. (See Chapter 5, Section 5.5 for a discussion of similar examples in English.)

29. It is tempting to treat the R-position in PP as a clitic position adjoined to the preposition. Although this may be appropriate for the phonetically similar examples in German, it is untenable for the Dutch structures, since it would be impossible to derive a principled distinction

between the R-pronouns and the [+Human] pronouns with respect to the NP position within PP. This applies equally to WH-movement out of PP and to the so-called R-movement construction, both of which require government of the empty NP position.

30. Perhaps the verb-like status of the motional postpositions is partly responsible for the fact that only these postpositions may be incorporated into a complex verbal structure by means of a word-formation rule. We will not pursue this possibility here.

31. See fn. 20 above.

32. Crucially, in order for (62) to derive the position of R-pronouns in PP, we must assume that the R-pronouns are always NPs, contrary to our earlier citation of Van Riemsdijk's observation that they function as Pro-PPs as well. We can interpret the PP-like behavior of these pronouns as being an artifact of their intrinsic Case features, which renders a governing preposition unnecessary for the purpose of satisfying the "visibility" condition on θ -role assignment.

Condition (62) actually may require some refinement if prepositions do not actually subcategorize for syntactic categories. Recall that the inability of prepositions to function as proper governors can be derived from the fact that they do not have a true thematic grid structure equivalent to that of verbs. But if strict subcategorization features are addenda to slots on a θ -grid, then prepositions could not subcategorize in the same way. Suppose that this is correct. It would then follow that (62) would have to be restated as a condition applicable to S-structure in which an NP appears as the object of P.

33. These remarks do not apply to the "PP-like" R-pronouns, as observed in the preceding footnote.

34. Both of these subcategorization frames are needed independently, and it would presumably require negative evidence to inform the child of the unavailability of the R-position in this particular context in an R-movement theory.

35. One problem with this account is that the relevant condition must not rule out reanalyzed structures in English where both an NP object and a preposition from a following PP are reanalyzed within the verb:

(i) Who did you [buy - the book - from] -- ?

It seems that the relevant distinction between (i) and (66, 67) is that the NP in (i) is not itself linked to an empty category in \bar{V} , unlike the otherwise similar Dutch R-island examples. We will not attempt to develop a rigorous formalization of the condition here.

36. In (69), it is not necessary to assume that the verb must govern a trace of *waar*. This is because adverbial PPs in COMP may count as specifiers, by virtue of being sisters of S, as suggested in Chapter 4, based on an idea of J. Huang. This does not apply to the cliticized R-pronouns, which must link to an empty category in \bar{V} , by virtue of their status as clitics.

37. I am grateful to Hilda Koopman for grammaticality judgments.

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