

EFFECTS OF HEAD-MOVEMENT ON THEORIES OF
SUBJACENCY AND PROPER GOVERNMENT

by

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Submitted to the Department of Linguistics and Philosophy
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Abstract

This dissertation offers a perspective from which to view the relationship between extraction and head-movement. In particular, it claims that bounding theory must take syntactic head-movement into account in defining bounding domains, and that the possibility of subject extraction is related to abstract verb movement to C, which is argued to be a consequence of the interaction between the Principle of Full Interpretation and various principles in the grammar.

It is suggested that bounding domains be defined with respect to head-movement. Specifically, a potentially bounding category can be subsumed under another if their heads are morphologically merged. As a result, the dominating maximal projection comes to delimit the bounding domain. Evidence is presented to show that VP can be bounding in general, and that cases where the bounding effect is seemingly absent are due to head-movement. It is also shown how this conception of bounding domains fits into a theory of bounding with two parameters which can annul bounding effects of maximal projections by complementation. A principled explanation obtains for why certain combinations of categories as bounding domains are possible, and why some others are not. The predicted four types of languages with respect to bounding variations are all attested. It is argued that in order to account for the extraction asymmetry between adverbials and others, successive-cyclic movement should be strictly constrained by structure-preservation.

The apparent lack of the *that*-trace effect in some instances is suggested to have a principled explanation in terms of abstract verb movement to C, which is either a result of the Principle of Full Interpretation interacting with a theory of expletive replacement, or is due to some language-particular property like the verb-second constraint in most Germanic languages requiring movement of the finite verb to the empty C position at LF, if it is not already there at S-structure. One desirable consequence that immediately follows is that the class of proper head-governors can now be restricted to all and only lexical categories. It is suggested that abstract verb movement to C in relative clauses is independently justified by theory of predication, which requires a lexical category to fill the head of a constituent which is semantically a predicate. Consequently, the subject trace is properly head-governed by the verb in C. The possibility of abstract verb movement to C thus explains in a uniform way the anti-*that*-trace effect in relative clauses and the *that*-trace effect in complement clauses, without the assumption that the complementizers in these two types of constructions are different entities.

Thesis Supervisor: Noam Chomsky
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*Note: A version of this dissertation is being prepared for MIT Working Papers in Linguistics

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Chapter 1

Overview

1.1. Introduction

From an informal point of view, this dissertation investigates the differences among particular languages with respect to question and relative-clause formation. From a more formal and theory-bound perspective, it probes the licensing conditions for extraction. In particular, it studies the effects induced by verb movement on the bounding domains with respect to the Subjacency Condition, as well as on the constraint sanctioning traces left behind by subject extraction, namely the Empty Category Principle.

This chapter serves as a lay-out of the basic assumptions that we will be making for the discussions in this work. There are three major parts in this chapter. Section 1.2 is a review of some of the basic conceptual assumptions in linguistic theory. In particular, it sketches an abstract model of language on which further technical details and executions are based. Sections 1.4 to 1.8 essentially consist of definitions and fundamental notions in syntactic theory, with some minor modifications. This section is to serve as a reference, to make explicit the background assumptions of the thesis, and to avoid distracting digressions in latter chapters. However, as relevant empirical facts require, some of these notions and definitions are modified. New notions and definitions will be introduced in the thesis itself, as arguments are provided there. Readers familiar with the literature of generative grammar may skip this section, and come back to it when the need arises. Section 1.9 is an overview of the chapters of the thesis. For convenience, a list of all abbreviations is included in section 1.10. An appendix on the Projection Principle is in the end of the chapter.

1.2. A Generative Model of Language

As is common in any scientific investigation of natural phenomena, we need an abstract model to provide an explanatory theory for the phenomenon under study. In the case at hand, the phenomenon is natural language. We call such an abstract model for natural language a **grammar**, which is but a formal system accounting for the arrangement of the sounds, as well as the pairing of it and meanings. In the conception of language of Chomsky (1957, 1965, 1975), as modified in Chomsky (1981, 1986a, 1989) and later known as the principles-and-parameters approach to language, the emphasis is put on the initial state of the grammar, which is rich enough so that upon exposure to experience, grammars of particular languages (English, Japanese, Swahili) are derived from it. A theory about the initial state of the grammar is what is known as **Universal Grammar (UG)**.

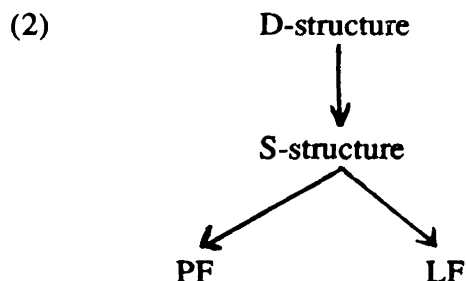
The goal of linguistic theory, we shall assume, is to account for the logical problem of language acquisition. As a cursory look at children of around five to seven years old would reveal, language can be acquired in a relatively short period of time. This can be explained if the class of humanly acquirable languages is narrowly constrained. We thus aim for a theory of language sufficiently constrained to yield such result.

As a starting point, I will assume the **Extended Standard Theory (EST)** model of grammar (Chomsky (1972, 1975), Jackendoff (1972)). In particular, the grammar consists of a base with a categorial component and a lexicon, which might be conceived of as a dictionary containing specific information about lexical items. The categorial component, constrained by **X'-theory** (defined below) and the **Projection Principle (PrP)**, determines the initial structures, the **D-structures**, of linguistic expressions that we ultimately hear, in accordance with the properties of particular lexical items in the lexicon. Although there are some conceptual¹ and empirical problems (cf. Appendix) with the formulation of the PrP, for concreteness, we will assume the version given in (1):

¹Cf. Rothstein (1983, 1984) for a discussion of the possibility that the PrP can be reduced to a syntactic theory of argument saturation, and theory of predication.

- (1) **The Projection Principle** (Chomsky (1981: 29)
Representations at each syntactic level (i.e., LF, and D- and S-structure) are projected from the lexicon, in that they observe the subcategorization properties of lexical items.

There are four levels of representations: (i) D-structure; (ii) S-structure; (iii) Phonetic Form (PF); and Logical Form (LF), each subject to principles and constraints particular to that level (Chomsky (1972, 1975), Jackendoff (1972)). The D-structure is related to an S-structure by a general rule *Move- α* , which, subject to certain constraints, allows movement of any element anywhere (perhaps reducible to the more general rule *Affect- α* , as suggested in Lasnik and Saito (1984), which allows operations of any sort to apply to any element at any level of representation. The rule is of course subject to constraints in the grammar). S-structures are then independently mapped into PF, and LF. This model of grammar can be conceptually represented as in (2):



The LF-representations serve as inputs to the Semantic Interpretation component of the grammar. In this thesis, our attention will be devoted to D-structure, S-structure and LF.

The PrP requires that elements displaced from their D-structure positions leave behind a trace in accordance with trace theory (Chomsky (1975, 1976), Fiengo (1974, 1979)). We assume with Lasnik and Saito (1984) that traces can delete if no principle or constraint of the grammar is violated (or equivalently movement from non-D-structure positions may optionally leave a trace if no principles require it). An element and the traces it leaves behind by movement constitute a **chain**, which we might understand to be a representation of the history of movement. Thus, we have a one-membered chain *John* in

(3), and a two-membered chain (*who*, *t*) in (4), *t* being the position from which *who* moves:

(3) Bill saw John

(4) Who did Bill see *t*?
↑

Principles and constraints of UG are operative in different modules of grammar, which are but theories about particular aspects of the grammar. Thus, each module contains principles, constraints and parameters specific to that module. However, the modules are related in some intricate way. Constraints and the fixing of the values of some parameters in a module might have far-reaching ramifications for other modules of the grammar.

To capture cross-linguistic variations, UG also provides for a set of parameters that have a small number of values, possibly two. Fixing one value or another of the parameters would yield different grammars. In general, principles and parameters of UG may apply at any level of representation. In the case of constraints on representation, by “apply” is meant a representation is checked against a certain principle or parameter. If it conforms to what the principle or parameter says, then the representation is well-formed with respect to it; otherwise, it will be marked as ill-formed (indicated with a * in the representation). In the case of constraints on movement, by “apply” is meant the movement is checked against a principle or parameter to see if it violates what the principle or parameter says. If it does, then we say the derivation of the representation as a result of such a movement is blocked. In other words, no such derivation is possible.

We shall assume two general principles of the grammar constraining the syntactic representations, and the derivations of such representations. The first one is the Principle of Full Interpretation (FI, Chomsky (1986a)):

(5) **Principle of Full Interpretation (FI)**

Every element at PF and LF must receive an appropriate interpretation

The other principle is the Principles of Economy (henceforth Economy (Chomsky (1989)), given in (6):

(6) **Principle of Economy of Derivation:**

- a. If two derivations from a given D-structure each yield a legitimate output, and one contains more steps than the other, only the shorter derivation is grammatical.
- b. UG principles take precedence over language-particular rules.
(i.e. UG principles are less “costly” than language-specific rules)

The intuition behind the rather vague Economy is that operations like movement, deletion, and language-specific rules take place at a “cost”, and that the least costly derivation is the derivation selected by the grammar.

1.3. Notational Conventions

In this thesis, the following typographic conventions are adopted. Technical terms that have theoretical standing, as well as those descriptive terms that have a specific construal are set in boldface when they are defined. Long names that are repeatedly mentioned will be abbreviated. Word-for-word translations are given immediately beneath non-English data, followed by an idiomatic translation in English. Grammatical features are minimally given so that only those that are directly relevant are indicated. For example, the German expression *die*, which roughly corresponds to English *the*, may be glossed as *the.PL* (cf. the abbreviation list at the end of the chapter) even though technically it has more features than those just given, if the points relevant to the discussion of the example do not crucially rely on other features. The prime notation is used instead of the bar notation. S (read “S-bar”) would be represented as S' , and the plural of S' is written as $S's$, and that of S is Ss .

Examples are renumbered after each chapter, and sections are referred to in the fol-

lowing manner. Section $w.x.y.z$ where w, x, y, z are numbers refers to Chapter w , section $x.y.z$.

1.4. Fundamental Notions and Definitions in Syntactic Theory

1.4.1. Syntactic Features

In order to account for the distribution of linguistic expressions, we assume that they have syntactic features, which are but lexical markings to distinguish one expression from another.

For example, we would say that *is* as in *John is a student* has the syntactic features third Person (annotated as 3), singular (SG) Number, present Tense (PRES), among others, of the verb *be* to account for why it occurs with a noun phrase with the singular, third Person features, and for the semantic information that it indicates present Tense, rather than past. More particularly, we say that it has the values third, singular, and present for the features Person, Number and Tense respectively. Another example of an expression having syntactic features is *ihm* in German. This expression has the features pronominal (PRON), third Person, singular Number, and Dative Case (DAT). Some other features will be introduced later in the course of our discussion. A set of features that we often refer to is the set of ϕ -features, which includes at least Number, Person, Gender, Case. We will include more features into this set as the need arises. For syntactic concerns, when we say a certain element has a some feature, we mean it has a syntactic feature, i.e. lexical marking on the element itself.

Each feature has one unique value out of the possible values for that feature. So an element is either a pronominal (i.e. [+PRON]) or not (i.e. [-PRON]), but not both (i.e. [\pm PRON]) at the same time. Two elements are said to have conflicting values with respect to some feature if and only if the values for that feature are not identical. For instance, the pronoun *he* has the feature singular Number ([+SG]), but the pronoun *they*

has the feature plural Number ([−SG]). They are said to have conflicting values for the feature Number.


Besides syntactic features, linguistic expressions also have phonological and semantic features, which specify how an expression is pronounced, and the meaning associated with it. Thus, we may take a lexical item as a bundle of features.

1.4.2. Indexation

To indicate a certain connection between two or more elements, we often employ indices, which are usually alphabetical subscripts on linguistic expressions, in our syntactic descriptions. For example, we might use the index *i* in as in (7) to indicate that the reference of the name *John* and the anaphor *himself* is the same:

(7) John_{*i*} likes himself_{*i*}.

or we might use some index *j* in as in (8a) to indicate that the position marked *t* is the position from which an element has moved. An equivalent way of indicating a movement relationship might also be expressed as in (8b):

(8) a. What_{*j*} did John see *t*_{*j*}?
b. What did John see *t*?


An index might also be used to indicate two elements as having the same feature-values:

(9) Mary_{*k*} is_{*k*} a student.

That is, *Mary* and *is* in (9) both have the value 3SG. We will explicitly state what the indices mean in a particular construction when it is not clear.

Of course, it is conceivable that we might use indices for other purposes as well, just as we could employ some other convention (for example, underlining) that would serve

the same purpose as indices do. Therefore, we will take indexing to be simply notational convenience that has no theoretical standing. Consequently, just as there is no reason to think that percolation of underlining has any theoretical status, there is no reason why we should have mechanisms such as percolation of indices in our analyses. Furthermore, since indices are but notational convenience, their use for different purposes should not be mixed up. We could in principle use the same index for coreference and for agreement of ϕ -features:

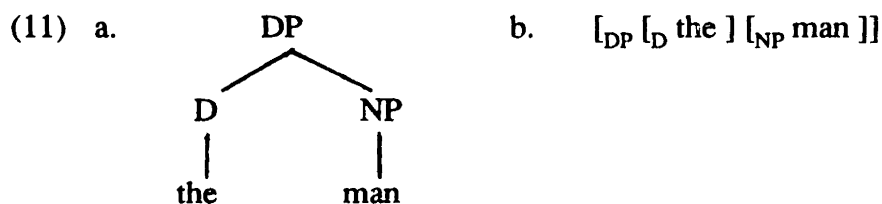
(10) John_i likes_i himself_i.

Such practice is quite confusing, and we should refrain from doing so.

Since there is no sense in which the verb has the same reference as that of the noun phrases that bear the same index, the sharing of the same index is merely a co-incident, and thus entails no theoretical claims. Statements of the sort like “ α binds β by virtue of having the same index,” or “ α properly governs β because they share the same index,” where “binding” and “properly government” have theoretical standing (see the section 1.5 for definition) would not figure in our analyses.

1.4.3. Syntactic Representations

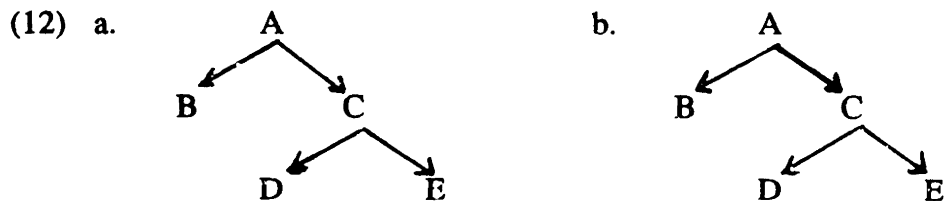
Linguistic expressions are represented as hierarchical tree structures, as in (11a)², which is sometimes also represented as a labelled bracketing structure, as in (11b):



²Cf. section 1.5.1 for constraints on such structures. The representations in (11) do not conform to those constraints.

We will sometimes refer to the representations in (11) as syntactic structures, or simply structures.

One of the fundamental notions in syntactic theory is the notion of dominance. In a structure like (12a) or (12b), we say A, B, C, D and E are nodes:



and that the node A dominates the nodes B, C, D and E, and immediately dominates B and C. The node C also dominates and immediately dominates the nodes D and E, but does not dominate A and B. The nodes B, D, E do not dominate any node. Elements that are immediately dominated by the same node are said to be sisters, and the immediately dominating node is said to be the mother (of the immediately dominated elements). Therefore, B and C are sisters, so are D and E in (12a). Node A is the mother of the nodes B and C. Technically, the lines in (12a) are downward arrows like those in (12b), which look like a directed graph familiar in the mathematic literature. For simplicity, we will assume representations like that in (12a) instead of that in (12b). Any node is a constituent, and nodes that are dominated by the same node, as D and E dominated by C in (12), are said to be constituents of that node. We also say that they are a constituent, if the dominating node exhaustively dominates them. Thus, D and E in (12) are a constituent.

Syntactic representations like (11) would then be structures in which nodes are labelled with a category name. A category name is a label that identifies the categorial feature of a linguistic expression. This is necessary in order to account for their distributions. If *boy* is of the category N (for nouns), *a* is of the category D (for determiners), and *put* is of the category V (for verbs), then the contrast between *a boy* and **a put*

follows from the statement that the category V does not occur in places where a category N occurs.

Besides the categories N, V and D, other categories that concern us in this thesis are adjective (A), prepositions (P), complementizers (C), and inflection (INFL, or I when no confusion arises with the first personal pronoun ‘I’). The four categories N, V, P and A are also known as the **lexical categories** since they can be defined in terms of the syntactic features $[\pm N, \pm V]$. D, C and INFL are **functional categories** since they are not so defined. We will introduce some more functional categories later on. So nouns are $[+N, -V]$, adjectives are $[+N, +V]$, prepositions are $[-N, -V]$, and verbs are $[-N, +V]$ (Chomsky and Lasnik (1977))³. These features presumably enable us to state linguistically significant generalizations. For example, the category $[-N]$, i.e. verbs and prepositions, assigns Case in English. We refer to both lexical and functional categories as **syntactic categories** (or simply **categories**). Occasionally, we will also deal with the category Adverb (ADV). It is not clear if it is of the lexical category or functional category, if being lexical or functional is related to definability in terms of the features $[\pm N, \pm V]$. All four logically possible for have been exhausted, so it should be functional. However, it differs from other functional categories in that it has semantic content, rather than purely formal elements like the English complementizer *that* as in *John said that Mary left*, whose presence does not seem to contribute much to the meaning of the sentence.

³Jackendoff (1977) credits the feature system to Chomsky (1970), but it is not found in the published version of the paper. It is perhaps in the unpublished version, which dates back to 1967, according to Jackendoff.

1.5. Modules of Grammar

The modules of grammar that concern us here are those concerning base structures (X' -theory), thematic relations, Case, government, proper government, and bounding. These modules are largely independent in that principles, constraints and parameters in each of them are about some particular aspects of the grammar. Yet, they are related in an intricate way. Modifications in one module might have consequences for the others.

1.5.1. \bar{X} -theory

Syntactic representations are constrained by X' -theory (read ‘‘X bar’’). Originally, it was represented as \bar{X} (Chomsky (1970), Jackendoff (1977)), which has the schemata as in (13), left-right order irrelevant:

- (13) a. $XP \rightarrow YP X'$
b. $X' \rightarrow X ZP^*$

where X and Y are variables ranging over syntactic categories. XP (or X^2) is called the **maximal projection**, X' (or X^1) the **intermediate projection** (or **one-bar projection**), and X (or X^0) the **zero-level projection** of the category X . The schemata in (13) say that a maximal projection XP , must dominate a node X' (both of which must be of the same category). Likewise, X' must dominate an X . The position where YP in (13a) occurs is called the **Specifier** (or simply the **Spec**) position of XP (or of X). Often, the notation $[SPEC, XP]$ is used to refer to the Specifier position of XP , and $[YP, XP]$, where Y is some category, to refer to the maximal projection YP that is dominated by XP . The position where ZP appears in (13b) is called the **complement position**, and ZP itself is called a **complement** of X . Two informal notions are **subject** and **object** (for Relational Grammar (Perlmutter and Postal (1974)), and Lexical Functional Grammar (Bresnan (1982))), these two notions have theoretical status, since grammatical operations refer to these notions, which are often used to refer to the element appearing the position under an X' -level of projection, and that in the Spec of IP respectively (cf. the syntactic tree for

clauses in (21)). Or more generally, an element appearing in the Spec of XP is its subject.

Recall the PrP requires that movement leave traces behind in accordance with trace theory. Moreover, a moved element and its traces constitute a chain, which we can now take to be an abstract representation of arguments. That is, just as we take *John* in (14) to be the argument of *hit*, we can take it to be the same in (15):

(14) Bill hit John.

(15) $John_i$ was hit t_i .

In other words, the chains (*John*) and (*John*, *t*) are abstract representations of the argument *John*.

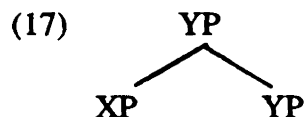
We will assume that an X'-theoretic relation that an X^o may have with another category is a relation between it and one of these three positions, but none others: (a) Head-complement relation; (b) Head-adjunct relation; and (c) Head-Specifier relation. The symbol * in (13b) is the Kleene star indicating zero or more occurrences of the entity it occurs next to. One fundamental notion in X'-theory is **head**. X' and X in (13) are heads of XP and X' respectively.

Structures that conform to the X'-schemata are said to be licensed by X'-theory. For example, the structure in (16a) is licensed, but that in (16b) is not:



This is because in (16b), N' does not dominate an N.

As we will see, there are structures that are not licensed by the schemata in (13), namely, those involving adjuncts. For example, in (17), we say XP is an adjunct to YP:



One simple extension of X' -theory to license the structure in (17) is to include the schema in (18):

$$(18) \quad X^n \rightarrow Y^n X^n$$

where X^n is a some projection of a category X . As indicated in (18), the number of bar-levels of the adjunct and the category adjoined to must be the same. It remains an open empirical question whether adjunction of one-bar-level projections is allowed.

We also say that in (17), YP has multiple segments (here, two), namely, the two occurrences of the label YP, and only one segment of YP dominates XP (May (1985)). We thus admit categorial projections that have more than one segment. We define **domination by a category X** , the generalized notion of dominance discussed in (12), as being dominated by every segment of the category X (this is equivalent to Chomsky's (1986b) notion of inclusion). We can define a segment of a categorial projection formally as in (19):

- (19) An X^n is a segment of a categorial projection Y^m iff
- a. X has the same categorial feature as Y ; and
 - b. X^n immediately dominates Y^m , $n=m$, or $n=m+1$.

In (20), the topmost node labelled NP is a segment of an N-projection:

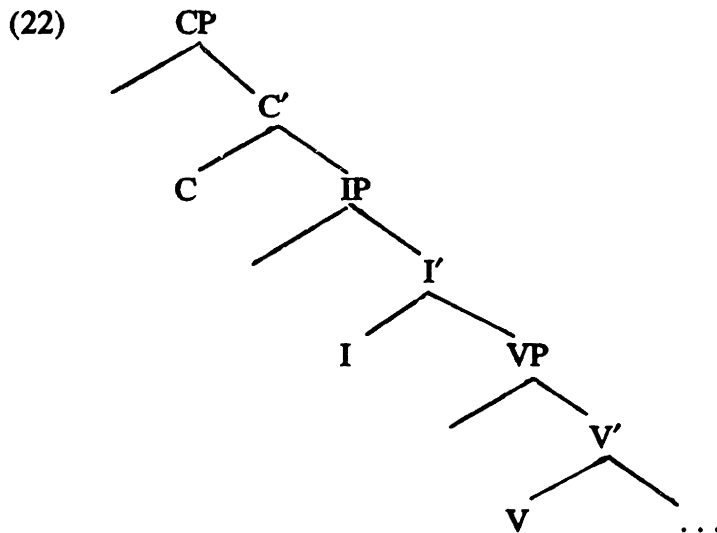
- (20) a. $[_{NP} AP [_{NP} [_{N'} N]]]$
 b. $[_{NP} [_{N'} N]]$

We thus might take an adjunct X to a category Y as a categorial projection that is immediately dominated by some but not all segments of Y . A specifier position is dominated by all segments of the maximal projection.

Lastly, we define the notion **exclusion** as in (21) (Chomsky (1986b)):

(21) α excludes β if no segment of α dominates β .

We will assume that the clause structure provided by UG is as in (22) (Stowell (1981), Chomsky (1986b)):



some other elements besides the verb under V' may appear in accordance with the argument structure of the verb. In the earlier view of clause structure (Bresnan (1970)), COMP is used to refer to both the C position for complementizers and [SPEC, CP] for *wh*-phrases. COMP is thus not a projection of any category, but a convenient term to refer to a position. We will mention COMP only in citations, and explicitly state whether we mean the C position or [SPEC, CP].

There is some issue for theory of categorial projection regarding empty positions in syntactic representations, though. If categorial projections are projections of categorial

features of lexical items, then, strictly speaking, empty positions are not possible. To allow for positions that literally contain nothing, it seems necessary to assume that categorial features are freely projected. Some checking mechanism, independently necessary in any event, would sanction insertion of particular lexical items. For instance, an NP may be freely projected as in (23), with e an empty position:

$$(23) \quad [_{NP} [_{N'} [_{N^0} e]]]$$

Some feature-checking mechanism would allow insertion of lexical items with the [+N] feature into the e position, but not that with [-N].

1.5.2. Hierarchical Relations

The two structural notions and definitions in syntactic theory that concern us here are c-command (Reinhart (1976:32)) and m-command (cf. Aoun and Sportiche's (1981:214) bi-condition):

$$(24) \quad \alpha \text{ c-commands } \beta \text{ iff}$$

- (i) α does not dominate β ; and
- (ii) the first branching node dominating α dominates β .

$$(25) \quad \alpha \text{ m-commands } \beta \text{ iff}$$

for all γ , γ a maximal projection, if γ dominates α then γ dominates β .

1.5.3. Theta Theory

Theta theory is a theory about thematic relations (Gruber (1965)), largely between verbs and their complements. Verbs are said to have an argument structure (also known as thematic structure), which is but a lexical representation of the number and kind of elements an X^0 must take. The elements in an argument structure of a verb are arguments of the verb, and the arguments are said to be selected (Grimshaw (1979)). In Williams' (1981) theory, an argument that appears in object position is called an internal argument, and one that appears outside VP is the external argument. An example of an

argument structure of the verb *eat* is as in (26), where the external argument is underlined:

(26) *eat* (NP, NP)

The arguments are said to bear a thematic relation with the selecting verb, which expresses information about who did what to whom. For example, in a sentence like (27):

(27) John ate an apple.

The expression *an apple* has a certain semantic relation with the verb *ate*, namely, it is affected by the act of eating in some way. It is thus said to have a Theme or Patient role assigned by the verb. In a similar manner, the expression *John* is said to be assigned the Agent role by the verb *ate*. There are some other thematic roles as well, like Source, Goal, Benefactive, Location, and Direction (Jackendoff (1972)). The precise characterizations of θ -roles have not been satisfactorily dealt with in the literature.

Arguments of a verb are said to be assigned a θ -role by the verb, and the position to which a θ -role is assigned is called a θ -position. Thus, θ -marking is a lexical property. Complement positions are uncontroversially θ -positions, but the status of subjects (for instance *John* in (27)) with respect to θ -marking is unclear. One possibility is that it is assigned a θ -role compositionally from the VP (Marantz (1984)). Alternatively, if it originates from the Spec of VP at D-structure (Kitagawa (1986), Fukui and Speas (1986), Kuroda (1986)), then it can be assigned a θ -role by either Spec-head agreement (cf. section 1.6.1), or government (cf. section 1.5.6).

For our discussion, the following concept of theta theory is relevant, which can be informally characterized as in (28) (Cf. Freidin's (1978) Principle of Functional Relatedness):

(28) **Theta Criterion (Chomsky (1981:36))**

Each argument bears one and only one θ -role, and each θ -role is assigned to one and only one argument.

One motivation of the Theta Criterion is to prevent a structure of sort in (29), meaning *John* was both the killer and the one who was killed:

(29) * John_i killed t_i .

In (29), the argument *John* bears both the Theme and the Agent roles assigned by the same predicate *killed*.

However, *the meat* in (30) seems to have more than one θ -roles, namely, one assigned by the verb *ate*, and one by the adjective *raw* (Williams (1980)):

(30) John ate the meat raw.

Assuming abstract representations of arguments as chains, we can take the Theta Criterion as in (31):

(31) Each argument α appears in a chain containing a unique visible θ -position P , and each θ -position P is visible in a chain containing a unique argument α .

Formally, it can be stated as in (32):

(32) **Theta Criterion (Chomsky (1981:335)):**

Given the structure S , there is a set K of chains, $K = \{C_i\}$,

where $C_i = (\alpha_1^i, \dots, \alpha_n^i)$, such that:

- a. if α is an argument of S , then there is a $C_i \in K$ such that $\alpha = \alpha_j^i$ and a θ -role is assigned to C_i by exactly one position P .
- b. if P is a position of S marked with the θ -role R , then there is a $C_i \in K$ to which P assigns R , and exactly one α_j^i in C_i is an argument.

That is, a chain has exactly one θ -position, to which one or more θ -roles may be assigned

to the same position. In the case where there are more than one θ -role assigned to the same θ -position, the θ -role-assigners must be different. The example in (29) is then ill-formed because the chain (*John, t*) has two θ -positions, each of them is assigned a θ -role by the same θ -role-assigner *killed*.

Returning now to the sentence in (30). The argument *the meat* is a one-membered chain, and the position it occupies is a θ -position with respect to the verb *ate*. In addition, according to William's (1980) theory of predication, *the meat* is also in a θ -position with respect to the adjective *raw*, if the structure of the sentence is as in (33):

(33) [_{IP} John [_{VP} [_{VP} ate the meat] [_{AP} raw]]]

That is, the AP *raw* is adjoined to the VP, a position from which the AP bears a mutual m-command relation with the argument *the meat*, sanctioning a predication relation. This in turn means that the argument *the meat* is in a θ -position with respect to the predicate *raw*. Thus, from the unique θ -position in the chain, the argument receives two θ -roles, one is assigned by the verb *ate* and one by the adjective *raw* to that unique θ -position.

One alternative to the structure in (33) would be one in (34), according to Williams:

(34) [_{IP} John [_{VP} [_{VP} ate the meat] [_{AP} PRO [raw]]]]

There seems to be some independent reason to assume (34) (cf. section 1.6.2)

1.5.4. Theory of Feature Selection

Although selectional restriction indicated in argument structures ensures what kind of argument is selected, certain patterns of selection do not seem to occur. For instance, there are no verbs that select a second Person pronoun as argument. We might then wonder whether there is some constraint on feature-selection, specifying what features and the conditions under which the features can be selected.

Some features appear to have semantic correlates with certain kind of expressions, but not others. The Number feature conveys the plurality of nominal expressions (e.g. *men* denotes a group of at least two men), but it does not seem to have significant semantic contribution when it appears on complementizers (cf. Chapter 3 on complementizer agreement in West Flemish) or verbs. That is, if complementizers are heads of the proposition-denoting CPs, then whether we have a plural or singular marking on the head of CP has no bearing on its meaning. It does not seem to make sense to talk about plural or singular propositions. Although we might think that the Number markings on the verb indicate the number of individuals participating in the event named by the verb, a closer look reveals that it might not be so. In a sentences like those in (35), we can tell how many individuals participating in the running event by looking at the argument of the verb:

- (35) a. John is running.
b. John and Mary are running.

In infinitivals, no ϕ -features are indicated morphologically in many languages. Yet, the information of the number of individuals in the event is conveyed through the Number feature of the argument:

- (36) a. He wanted to run.
b. They wanted to run.

In fact, in many languages like Chinese and Japanese, there is no Number markings at all on the verb. The Number feature on the verb thus has no semantic correlates. We assume that INFL is the locus where the ϕ -features agreeing with the subject reside, and to which the verb must be attached for morphological reasons. Just like in the case of verbs, the ϕ -features have no semantic correlates on INFL.

One other feature that does not seem to have semantic correlates is the (grammatical) Gender feature, which sometimes co-incides with the biological gender of the entities

denoted by the (nominal) expressions having the (grammatical) Gender feature. Very often, the two do not co-incide. In German, *Apfel* 'apple' is masculine, but *Pfau* 'peacock' is feminine. *Gold* 'gold' is neuter, but *Stahl* 'steel' is masculine. To my knowledge, there is no thematic selection that involves the Gender feature (that is, no verb requires its argument to be of a certain Gender).

Now, if we assume that only features that have semantic correlates can be selected (cf. Grimshaw (1979) and Pesetsky (1982) on the relation between semantic selection and syntactic selection), then we can explain why certain patterns of selection exist but not others. For instance, to my knowledge, no selection of CPs with a certain Number feature, or that of nominal expressions with a certain Gender feature, has been attested. The Number feature of course can be selected, but only if the feature on the argument has semantic correlates. Some verbs select a nominal expression with the plural feature (the example in (37b) is due to Jane Grimshaw):

- (37) a. The students/*student gathered in the courtyard.
 b. John merged the files/*file.

But here, the Number feature has semantic correlates on nominal expressions. It indicates their plurality. Since ϕ -features like Person, Number, Gender and Case do not have semantic correlates on \bar{C} and INFL, there should be no selection of ϕ -features on the projections of these categories. This is of course not to say that they cannot be selected with respect to some feature. In Russian, the complementizers *čto* heads a proposition of assertion, and *ctob* heads a CP that denotes a proposition expressing desire or demand (a proposition sometimes referred as having subjunctive Mood in traditional grammars). A verb like *trebuet* 'demands' in (38b) specifically selects the complementizer *ctob*:

- (38) a. Ivan skazal čto Maša ušla.
 said left
 'Ivan said that Maša left.'

- b. Ivan trebuet čtob Maša ušla
 demands left
 'Ivan demands that Maša leave.'

But since the subjunctive Mood has semantic correlate, namely, that of expressing demand or desire, it can thus be a selected feature on the complementizer.

English complementizers *that* is another example. It occurs only with a tensed clausal complement:

- (39) a. John claimed [that [Mary left]]
 b. *John claimed [that [to leave]]

1.5.5. Case Theory

Case theory accounts for the distribution of noun phrases. At the heart of the theory is the Case Filter and the assumption about the passive morpheme:

- (40) Case filter (Rouveret and Vergnaud (1980))
 *NP if NP has phonetic content and NP has no Case.

- (41) Passive morpheme absorbs Case.

First, let us see how an NP gets Case. Two ways an NP may get Case: (i) if it occurs as a complement to a Case-assigner like a transitive verb or a preposition (e.g. under the V' headed by a verb like *saw*, the surface form of *see* with past tense morphology); (ii) subject of a Tensed clause, i.e. in the Spec of an IP with the Tense feature in INFL:

- (42) a. John saw Bill.
 b. *John sneezed Bill.
- (43) a. John said Bill is intelligent.
 b. *John said Bill to be intelligent.

There has been much discussion about whether the Case filter can be reduced to the

Visibility Condition, which says that an argument is visible for θ -marking if and only if it has Case (cf. Aoun (1979)). But expletives like *there*, which presumably cannot get a θ -role, need Case in any event:

- (44) a. John said there are flies in the room.
b. *John said there to be flies in room.

Lasnik (1990) suggests that they need Case to be visible for replacement. That is, *flies* moves in the position occupied by *there* at LF, an operation ultimately derived from FI (Cf. Chapter 3). Alternatively, that expletives need Case can be attributed to the Visibility Condition indirectly in that without Case, the argument *flies* would be invisible for θ -role assignment, even when it has moved to replace *there* in the non-Case-making position. (Cf. Epstein (1990) for a discussion of the desirable consequences of not subsuming the Case Filter under the Visibility Condition).

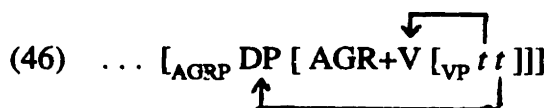
Case is divided into two types: (i) structural Case; and (ii) inherent Case. Structural Case is generally realized morphologically as Nominative and Accusative; others are inherent Case. The difference between these two is that the inherent Case is associated with a specific θ -role. For example, Dative Case is usually associated with Benefactive or Goal. Genitive case as in *John's book* is perhaps an exception (*John* can be the owner, the writer or the lender of the book, among other possibilities). In this work, we will be concerned with structural Case only. Without specific mention, Case means structural Case.

Case-assignment is assumed to be under government (defined in the next section). Thus, we admit Case-assignment to the embedded subject by Exceptional Case Marking (ECM) verbs like *believe*:

- (45) a. John believed [_{IP} himself to be intelligent].
b. John believed [_{IP} there to be a riot].

This is possible since *believed* governs *himself* and *there* in (45), even though the latter two are not in a complement position.

As we mention earlier, an argument also may get Case by Spec-head agreement (cf. discussion of agreement in section 1.6). Recent work by Chomsky (1989) also raises the possibility that assignment of Accusative Case and Nominative Case, both structural Cases, can be collapsed into one, namely, by Spec-head agreement. This entails that just like an (external) argument getting the Nominative Case by being in the Spec of IP, an (internal) argument gets the Accusative Case in the Spec of some AGR_OP projection (henceforth AGRP for simplicity. Cf. section 1.6.2 on DP):



To totally assimilate Nominative Case and Accusative Case assignment entails that Case is checked at LF, where by checking is simply meant feature-matching (here, the Case-feature) between the Case-assigner and the argument to which the Case is assigned. For example, the Accusative case of *himself* in the example in (45a) would be checked at LF, where it has raised to the Spec of the matrix VP, as in the representation in (47), a configuration that does not obtain at S-structure:



Putting theta theory and Case theory together, we have a Chain Condition in (48) (Chomsky (1986a), for our purposes here, we can take CHAIN in (48) as chain), as well as the Uniformity Condition in (49) (we take NP in (49) to mean DP in this work):

(48) The Chain Condition

If C=($\alpha_1, \dots, \alpha_n$) is a maximal CHAIN,
 then α_n occupies its unique θ -position, and
 α_n its unique Case-marked position.

(49) The Uniformity Condition

If α is an inherent Case-marker, then α Case-marks NP iff
 α θ -marks the chain headed by NP.

The Uniformity Condition would allow the example in (50b) since the derived nominal *destruction* assigns a θ -role to the the chain (*the city, t*), hence can assign an inherent Case (here, Genitive case) to the chain. since

(50) a. The [destruction of the city]

b. [The city] 's destruction *t*
↑—————↓

(51) a. The [certainty that John will win the race]

b. *John's certainty [*t* to win the race]
↑—————↓

but the example in (51b) would be ruled out by the Uniformity Condition since the chain (*John, t*) is not θ -marked by the derived nominal *certainty*, but is assigned an inherent Case.

1.5.6. Theory of Government

A recurrent theme in our discussions is the notion of government, of which there are several subcases, depending on the governor: government (Chomsky (1986b)), head-government, and antecedent-government (Chomsky (1981)). Their definitions are given as follows:

(52) α governs β iff α m-commands β and there is no γ, γ a barrier for β , such that γ excludes α .

(53) α head-governs β iff α governs β , and α is an X^0 .

(54) α antecedent-governs β iff α governs β , and α and β are related by movement⁴.

⁴I depart here with the standard assumption on antecedent-government which requires co-indexing. The reason behind this departure is that co-indexation has no theoretical standing in my view.

We will assume that government of β by α are blocked by either (i) the **Minimality Condition**, defined in (55), also known as Rigid Minimality; or by some barrier intervening between α and β , where barrier, and the related notions, are defined as in (55)-(48) (Chomsky (1986b), where the greek letters are variables ranging over maximal projections):

(55) **Minimality Condition:**

α does not govern β in the following configuration

if γ is a projection of δ excluding α :

... α ... [γ ... δ ... β ...]

(56) α θ -governs β iff α is a zero-level category that θ -marks β .

(57) α L-marks β iff α is a lexical category that θ -governs β .

(58) β is a **blocking category (BC)** for β iff γ is not L-marked and γ dominates β .

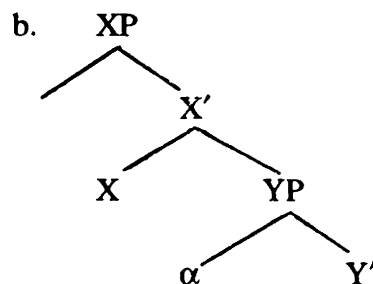
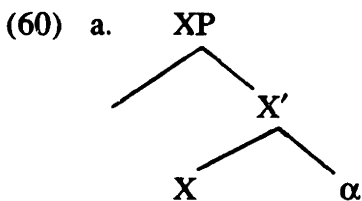
(59) γ is a **barrier** for β iff (a) or (b):

a. γ immediately dominates δ , δ a BC for β .

b. γ is a BC for β , $\gamma \neq IP$.

Since complement positions are θ -positions, XPs in those positions are always L-marked.

Our definition of head-government thus encompasses the following configurations where X governs α in (60a), where there is simply no XP between X and α :



In (60b), if X is a lexical category, then YP is L-marked by X. YP is thus not a barrier for α . With m-command as the relevant condition for government as given in (52), X in (60) would govern its Spec position.

1.5.7. Theory of Proper Government

This module of grammar imposes a constraint on the distribution of traces left by movement (on some theories also on null pronominals (Jaeggli (1982), Rizzi (1986))). The Empty Category Principle (ECP), a constraint on representation, is defined as in (61) (Chomsky (1981)), where α is a phonetically null non-pronominal:

(61) [α e] must be properly governed.

It gives rise to the notion of proper government, which has two formulations: (i) the disjunctive formulation (Chomsky (1981), Lasnik and Saito (1984)) as in (62); and (ii) the conjunctive formulation (Stowell (1981), Jaeggli (1981), and Rizzi (1990a)), as in (63):

(62) α is properly governs iff
a. α is head-governed; or
b. α is antecedent-governed.

(63) α is properly governs iff
a. α is head-governed; and
b. α is antecedent-governed.

We will discuss the empirical predictions of these two formulations.

1.5.8. Bounding Theory

Bounding theory is a theory about the locality condition on movement, that is, the domain within which two positions may be related by movement. One constraint on movement that will concern us here is the Subjacency Condition (Chomsky (1973, 1977a)), henceforth simply subjacency:

(64) **Subjacency Condition**
No movement may involve the positions X and Y in the configuration:
... X ... [α ... [β ... Y ...] ...] ... X ...
where α , β are cyclic nodes.

where the cyclic nodes are taken to be NP and S (=IP), which we might also take as bounding nodes (Chomsky (1981)). Informally, then, subjacency requires that each move (in a series of successive movement in the case of long-distance movement) must not cross more than one bounding node.

A domain out of which extraction is impossible is said to be an island (Ross (1967)). For example, the movement in (65) violates subjacency, since it crosses two bounding nodes, NP and IP:

(65) *_{CP} Who [did _{IP} John have _{NP} the belief _{CP} *t* that _{IP} Bill saw *t*]]]]] ?

We assume that in general, *wh*-phrases may make a transition, or land in a Spec of CP, as in (65). In cases of long-distance movement, a *wh*-phrase may make a series of moves, each of which obeys subjacency, as in (66):

(66) _{CP} Who [do _{IP} you think _{CP} *t* [that _{IP} Bill saw *t*]]]]] ?

We will also say that the Spec of CP can be used as an escape hatch.

Another island effect is the *wh*-island effect, where an escape hatch is occupied by a *wh*-phrase so that it is no longer available for another *wh*-phrase to make a transition:

(67) *_{CP} Who [do _{IP} you wonder _{CP} where [_{IP} Bill saw *t* *t*]]]]] ?

As we will see in chapter 2, we will improve upon the bounding theory in generalizing the bounding effect to all maximal projections, with the proviso that the effect may be annulled by the bounding parameters in a principled way.

1.5.9. Binding Theory

Since we will touch only very briefly on binding theory in this work, we will not go into the theoretical details of binding theory. Binding theory is a theory that explains the distribution of anaphors (like the reflexive *himself* or the reciprocal *each other*), pronouns (like *me* and *him*), and R-expressions (referring expressions like *John* and *the man*).

There are three conditions of the binding theory, where **bound** means coreferential (Chomsky (1986a)):

- (A) An anaphor must be bound in a local domain.
- (B) A pronominal must be free in a local domain.
- (C) An R-expression must be free (in the domain of the head of its chain).

These three conditions are responsible for the grammatical patterning in (68)-(70) (indices here indicate coreference, and the brackets are the governing category for an anaphor or pronominal. Cf. Chomsky (1981, 1986a) for a discussion of how a local domain for these elements is defined in general):

- (68) a. John said Mary is intelligent.
b. *John said [himself is intelligent]
- (69) a. John_i believed [he_i is intelligent]
b. *[John_i believed him_i to be intelligent]
- (70) a. *John_i believed John_j is intelligent.
b. John_i believed John_j is intelligent.

If we take nominal expressions as definable in terms of two features [\pm anaphor] and [\pm pronominal], then anaphors would be [+anaphor] [-pronominal], pronouns would be [-anaphor] [+pronominal], and R-expressions would be [-anaphor] [-pronominal]. The fourth type of nominal expression would be [+anaphor] [+pronominal], represented as PRO, which is phonetically null. According to the binding conditions would have to be both bound and free in a local domain, an impossibility. It thus follows that it does not have a local domain. This accounts for why PRO is not possible in (71):

(71) *John believed [PRO is intelligent]

It is suggested in Chomsky (1981) that PRO must not be governed, or that PRO may be governed but only under certain conditions (Bouchard (1981), Koster (1984)). We will not deal with PRO in any great detail in this work. For our purposes, we will assume the descriptive generalization that PRO may not appear in a position where Case is assigned, which is unproblematic for the theories about government of PRO we just cited.

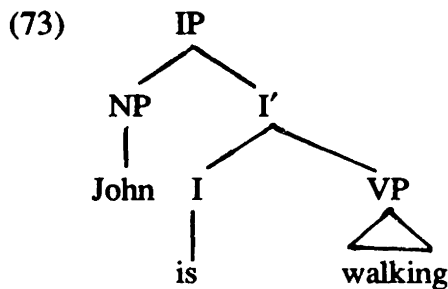
1.6. Theory of Agreement

1.6.1. Spec-head Agreement

Consider the following grammatical contrast:

- (72) a. John is walking.
b. *John are walking.

the two sentences differ minimally with respect to the form of the verb *be*. Whereas *is* has the features [3SG], and may co-occur with *John* which also has those features; *are* has the feature [+PL] (among others), and thus cannot co-occur with *John*. We must have some way to ensure such feature-matching in order to account for the co-occurrence restriction. Suppose *John* appears in the Spec of IP, and *is* is in INFL (the triangle in (73) abbreviates the internal structure of the constituent):




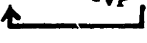
then *John* bears a Spec-head relation with *is*. We thus will assume that in general, feature-matching between two elements can be effected if there is a Spec-head relation between them. We formally define Spec-head agreement as in (74):

- (74) α may Spec-head-agree with β if there is a Spec-head relation between α and β , and their feature-sets are non-distinct.

where non-distinct is defined as in (75):

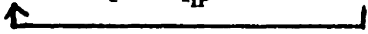

- (75) Two sets of features are non-distinct iff
- they have a non-empty intersection; and
 - for the features that they have in common, the values are not in conflict.

For a sentence like that in (76a), we will assume that there is an abstract agreement morpheme base-generated in INFL, and for morphological reason, it must be lexically supported (Lasnik (1981)). In a language like English, INFL lowers to V (Emonds (1976)), by Affix-Hopping (Chomsky (1957)):

- (76) a. John walks.
 b. S-structure: $[_{CP} \text{John } [\textit{t} [_{VP} \text{I+walk}]]]$

 c. LF: $[_{IP} \text{John } [\text{I+walk } [_{VP} \textit{t}]]]$


In the S-structure in (76b), INFL is c-commanded by its own trace. In order for the representation not to violate the ECP, the V+I complex must raise back to INFL. As we will see in section 1.8, the chain (t , I) created by INFL-lowering is not a legitimate object; therefore, there is another reason why the V+I complex must raise back to INFL.

Spec-head agreement does not always obtain, as shown by the ungrammaticality of the sentences in (77), if their structures are as given in (78):

- (77) a. Which men has John seen?
 b. *Which men have John seen?
- (78) a. $[_{CP} \text{Which men } [\text{has } [_{IP} \text{John seen } \textit{t}]]?$

 b. $[_{CP} \text{Which men } [\text{have } [_{IP} \text{John seen } \textit{t}]]]?$


The *wh*-phrase *which men* does not agree with the finite verb *has*, but *John* does. If we assume that there is no Spec-head agreement in CP (that is, agreement between the Spec of CP and C, also known as agreement in COMP, cf. sections 3.5 and 5.8), even though there is a Spec-head relation between them, then the ungrammaticality of (77b) follows. To account for the grammaticality of (77a), we might assume that the finite verb agrees with the subject in the Spec of IP, and moves from there to C (Jackendoff (1972), Emonds (1978)):

(79) [_{CP} Which men [_{I'} has [_{IP} John [_t [_{VP} seen *t*]]]]]?

The example in (79) then shows that agreement does not automatically obtain between elements bearing a Spec-head relation. We might assume that once Spec-head agreement between some two elements has taken place, no more agreement between any of them and some other element is possible (Noam Chomsky, class lectures, Fall 1990). Or more formally, agreement is a property of chains.

In cases involving movement, as that in (80) where *t* is the trace left behind by *which books* in accordance with trace theory:

(80) [_{CP} Which books [did [_{IP} you say [*t* were/*was on sale]]]]?

Since there is no Spec-head relation between the embedded finite verb *were* and the *Wh*-phrase *which books*, we cannot appeal to Spec-head agreement to ensure agreement between *were* and *which books*. We might get around this problem by saying that the verb *were* agrees with *which books* via its trace *t*, with which it has a Spec-head relation, and that traces have the same set of ϕ -features. Alternatively, we can think of ϕ -features as properties of chains. Therefore, the verb *were* bears a Spec-head relation with the trace *t*, hence agrees with the chain to which the trace *t* belongs. The chain has the plural features, since it has as a member an element with the plural Number, namely, *which books*.

1.6.2. Non-Spec-head Agreement

There are also other well-known agreement phenomena that do not fall under Spec-head agreement, namely, adjective-noun agreement and determiner-noun agreement. Expressions like those in French in (81), are apparently not licensed by the Spec-head relation, if the structures of these expressions are as in (82):

- (81) a. grand/*grande homme
b. vieille/*vieux dame
- (82) a. [_{NP} [_{AP} grand] [_{NP} homme]]
b. [_N [_A grand] [_N homme]]

That is, adjectives might be X^o-modifiers or XP-modifiers. Since there is only one Spec position per maximal projection, and there might be more than one modifying adjective (cf. *grande vieille dame* 'tall old woman'), adjectives are thus adjuncts (to either X^o's or XPs).

One way to account for adjective-noun agreement is by predication (Williams (1980)), which is defined as a relation between a predicate YP and the "subject" of predication XP in the configuration (83) where XP and YP c-command each other (cf. Rothstein (1983, 1984) for a slightly different view of predication):

- (83) [_{YP} XP YP]

Intuitively, we might understand a predicate as expressing a property of the subject of predication.

One way to define agreement by predication might be that there is a requirement of feature-matching between the heads of the constituents having a predication relation as in (83). Consequently, there is (Gender, Number) agreement between the predicate *sérieuse* 'serious' and *affaire* 'affair' in the French expression in (84):

- (84) Je considère [_{AP} [_{NP} cette affaire] [_{AP} sérieuse]]
 I consider this affair serious
 'I consider this affair serious.'

Structurally, the configuration in (83) looks very much like a structure in which XP is an adjunct to YP. Therefore, alternatively, we might understand adjective-noun agreement as agreement licensed by the X'-theoretic Adjunct-head relation. The structures in (82) are exactly as that in (83), except for the bar-levels; therefore, they fall under agreement by predication.

As we will see in Chapter 5, there is some complication with the notion of agreement by predication when we look at relative clauses. If we alternatively take the structure of (84) to contain a null pronominal PRO as in (85), then we can assimilate agreement in this case to that in relative clauses by some agreement linking rule, which licenses the agreement between PRO and YP (section 5.8):

- (85) Je considère [_{AP} [_{DP} cette affaire] [_{AP} PRO [sérieuse]]]
└──────────┘
 agreement linking

Since the head A° *sérieuse* 'serious' agrees with PRO by Spec-head agreement, the DP *cette affaire* 'this affair' derivatively agrees with the adjective.

The other agreement phenomenon that does not fall under Spec-head agreement is the determiner-noun agreement. Consider the English expressions in (86):

- (86) a. This/*these man
 b. These/*this men

If *this* and *these* are of the category adjective, then the determiner-noun agreement fall under agreement by predication like the case of adjective-noun agreement. However, *this* and *these* do not seem to be predicates semantically. If this is so, then the determiner-noun agreement has to be licensed in some other way.

In a DP-analysis of noun phrase (Barwise and Cooper (1981), Brame (1981, 1982), Szabolcsi (1983), Abney (1987) and many others), the structure of the noun phrase is something like that in (87) (we henceforth use the locution nominal projection to refer to both DP and NP):

(87) $[_{DP} [_{D'} D NP]]$

where the determiner is the head of the noun phrase. Obviously, the relation between D and NP is not a Spec-head relation, but a Head-complement relation. It thus falls under neither Spec-head agreement nor agreement of predication. There are two possibilities that we might consider here.

We can assume LF-raising of the NP complement to the Spec of D, assimilating determiner agreement to Spec-head agreement. That is, the agreement features are checked at LF. In the approach, then, a derivation of the noun phrase *these men* would be as in (88):

(88) a. S-structure: $[_{DP} [_{D'} \text{these} [_{NP} \text{men}]]]$

b. LF: $[_{DP} [_{NP} \text{men}] [_{D'} \text{these } t]]$

Spec-head agreement

However, if Abney (1987) is correct in that the Spec of D is a position where Genitive is assigned, for instance as in (89) (the exact position where the possessive morpheme 's occurs need not concern us here):

(89) $[_{DP} \text{John} [_{D'} 's [_{NP} \text{book}]]]$

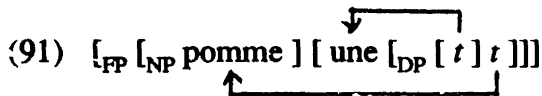
then the derivation in (88) should be impossible.

One other possibility is that determiner agreement does not fall under Spec-head agreement at all, but under selection (of agreement features). On this view, determiners

determiner like *those* would select a plural NP like *books*. In languages like French in which there is also Gender agreement between the determiner and the head noun of the NP complement:

- (90) a. Une/*un pomme
 a.FEM/a.MASC apple
 ‘An apple’
 b. Le/*la parc
 the.MASC/theMASC park
 ‘The park’

If the view we adopted in section 1.5.4 in that only features that have semantic correlates can be selected, then Gender agreement would be a problem for the DP-analysis. It may be that there is some functional projection FP dominating the DP, with LF-movement of the NP complement to [SPEC, DP], agreement between D and NP thus falls under Spec-head agreement:




Determiner agreement would then parallel agreement in AGRP. It is not obvious that an analysis along the lines in (91) is correct, and its consequences remain unclear. I leave this problem for future research.

1.7. Morphological Spell-out Rules

One issue that occasionally comes up in the syntactic literature is how the actual forms of lexical items are inserted in the syntactic representations. If we assume the formulation of the PrP as given in (1), then lexical insertion must take place at D-structure. However, in a theory of passive according to which subjects originate in a D-structure object position, how do we ensure that the form of the finite verb and that of the subject agree? Consider the examples in (92):

- (92) a. John was seen *t*
-

b. *John were seen t


If the D-structure of (92) is as in (93), and lexical insertion takes place at D-structure, then there seems to be no way to ensure that the singular form of the verb *be* show up, since there is simply no relation between *John* and *was* in (93) to license Spec-head agreement:

(93) e was seen John

One way to get around this problem is to insert the non-finite form of the verb in the syntactic representation, then after the agreement relation is licensed (by the Spec-head relation) when *John* has moved to the Spec of IP, some morphological rule like (94) would specify the phonetic form of the verb in the indicated environment (Chomsky (1957)):

(94) $be + \text{PAST.3SG} \rightarrow was$

where [+PAST.3SG] is some feature bundle, which we might understand to be the conditions for the phonetic form on the right-hand side of the arrow to obtain. Rules of the sort in (94) are commonly known as (morphological) spell-out rules. Notice that these rules can be abstracted to capture regularities in the language. For example, a present tense rule for English verbs might look like (95):

(95) $V + \text{PRES.3SG} \rightarrow V + s$

Of course, suppletion rules must be postulated for verbs like *be* that do not obey the rule in (95). Spell-out rules are also language-specific, so the counterpart of (94) in German would be something like (96):

(96) $sein + \text{PAST.3SG} \rightarrow war$
 ‘be’ ‘was’

But the form of the rules is universal: there is a basic form of the lexical item and the conditions for the rule (i.e. the left-hand side of the arrow), and the phonetic form to which the basic form is to be realized as (i.e. the right-hand side of the arrow). Notice also that the feature 'bundle must be adjacent, perhaps as a sister, depending on the theory of spell-out rules, to the basic form in order to meet the conditions of the rule.

The approach sketched above assumes that the lexicon contains only the basic forms (i.e. forms that do not have any ϕ -features. For example, *be* but not *is* and *were*), and that the morphological component of the grammar takes the syntactic representations as inputs and spells out the phonetic forms when the basic forms get the appropriate features. In other words, the morphological component of the grammar is somewhere after S-structure.

Alternatively, we might suppose that the lexicon contains lexical items with all the possible phonetic forms (i.e. lexical items have ϕ -features. For example, all the possible forms of *be* such as *is*, *are*, *was* etc, perhaps generated by some morphological component of the grammar. Cf. Lieber (1980)), and that they are freely inserted in the syntactic representations. Of course, this would generate at S-structure and PF as well both the grammatical a sentence like (92a) and the ungrammatical ones like (92b). However, at LF, some feature-checking mechanism operates to ensure that elements bearing an agreement relation actually have matching features. If they do not match, then the representation is assigned a * indicating it as ill-formed. The view is not implausible given that we can utter a sentence like (92b), but the status of the sentence is simply deviant. For concreteness, we will adopt the latter view, but nothing seems to hinge on this choice for our discussions here.

1.8. LF-objects

We will admit the following elements as legitimate objects at LF in the sense that only these will have an appropriate interpretation (from (Chomsky 1989)), each of which a chain $(\alpha_1, \dots, \alpha_n)$:

- (97) a. **Arguments:** each element is in a A-position, α_1 Case-marked and α_n θ -marked, in accordance with the chain condition.
b. **Adjuncts:** each element is in an A'-position.
c. **Lexical elements:** each element is in an X^o-position.
d. **Predicates, possibly predicate chains** if there is predicate raising, VP-movement in overt syntax, and other cases.
c. **Operator-variable constructions,** each a chain (α_1, α_2) , where the operator α_1 is in an A'-position and the variable α_2 is in an A-position.

We will assume that the principle in (98) to guarantee that only the permissible LF-objects are present at LF:

- (98) **Principle of Last Resort:**
Affect- α applies only to yield legitimate LF-objects.

In other words, if the LF-representation is already legitimate, Affect- α may not apply.

1.9. Overview of the Chapters

The primary concern of this dissertation is to investigate the relationship between extraction possibilities and head-movement with respect to bounding theory and proper government theory. It is claimed that syntactic head-movement has some effect on bounding domains and that abstract verb movement to C licenses subject extractions. A major focus of this work is to look at the interactions of various principles and parameters of grammar, and to explain why certain syntacture structures are parametrically possible, but some others are not.

Chapter 2 considers cross-linguistic variations with respect to subjacency, as well as

the effect of head-movement on defining bounding domains. I claim that all maximal projections are bounding in general, but the effect can be voided by complementation: either by lexical selection, or by functional selection. The two parameters for effecting bounding domains partition the class of languages into four with respect to possible bounding variations. This strong prediction is attested. One bounding domain can also be subsumed under another, if their heads are morphologically merged. This conception of bounding theory fits particularly well in syntactic theories that assume a proliferation of functional projections. These additional projections would not create any more bounding domains since their heads are morphologically merged. It is shown that facts about extraction out of gerunds can be accommodated in this account in straightforward way.

Chapter 3 is concerned with complementizer agreement. On the assumption that some complementizers (like *that* in English heading a CP and its counterparts in other languages) are expletives, and that they must be removed at LF in accord with FI, it is shown that complementizer agreement can be given an account according to which the expletive complementizers are replaced by the finite verb in INFL by abstract verb movement to C at LF.

Chapter 4 shows how the suggested analysis for complementizer agreement has desirable consequences for theory of proper government, especially for subject extraction. The apparent lack of the *that*-trace effect is to be explained by abstract verb movement to C, which might be due to FI requiring expletive replacement, or to some independent property of particular languages to be derived from principles and parameters of UG, like the verb-second constraint in most Germanic languages, requiring the finite verb in the C position at LF, if it has not already moved there at S-structure for some reason. In this account of the lack of the *that*-trace effect, it is possible to maintain a strong claim about that the class of proper head governors, namely, it is restricted to all and only lexical categories. As the *that*-trace effect, it is argued that Economy considerations would prevent verb movement to C.

Chapter 5 investigates abstract verb movement in relative clauses. It is claimed that these constructions must be headed by the finite verb moving from I to C at LF, a consequence of predication theory. It is shown that with abstract verb movement to C, the anti-*that*-trace effect is automatically accounted for, which also affords us a unified analysis for the distribution of the complementizer *that*. The complementizer *that* is one and the same in both complement clauses and relative clauses, and the grammatical difference between them is to be attributed to the obligatory abstract verb movement to C in relative clause, and the impossibility of movement of the verb at LF because of Principles of Last Resort.

1.10. Abbreviation Conventions

1	: first Person
2	: second Person
3	: third Person
ASP	: Aspect
NOM	: nominative Case
ACC	: accusative Case
DAT	: dative Case
GEN	: genitive Case
MASC	: masculine Gender
FEM	: feminine Gender
INDIC	: indicate Mood
SUBJ	: subjunctive Mood
SG	: singular Number
PL	: plural Number
PRES	: present Tense
PAST	: pass Tense
FUT	: future Tense
PRT	: Particle
PRON	: Pronominal
PASS	: passive Voice

SM

: Subject marker

Appendix: A Note on the Projection Principle

The formulation of the PrP as given in (1) probably needs some adjustment, if Reinhart's (1989) analysis of *except*-phrase is correct. In her account, the phrase *except John* in (i) is base-generated in an adjunct position, and the quantifier phrase *everyone* is adjoined to it at LF, as in (ib), in order to interpret *everyone except John* as a constituent:

- (i) a. D-structure: $[_{IP} [_{IP} \text{Everyone left for Italy yesterday }] [\text{except John }]]$
b. LF: $[_{IP} [_{IP} t_i \text{ left for Italy yesterday }] [\text{everyone}_i [\text{except John }]]]$

The adjunct *except John*, although having the same θ -role as *everyone*, is not θ -marked at D-structure. The PrP given in (1) is thus empirically inadequate to cover cases like (i). Since the precise formulation of the PrP does not immediately concern us here, for concreteness, we will assume (1) as it is with the understanding that it might be reformulated in some fashion to extend its empirical coverage as well as maintain its original desirable consequences.

Another problem with the PrP as formulated in (1) is raised by constructions containing an embedded interrogative:

- (ii) D-structure: John wondered $[_{CP} [_{IP} \text{Mary saw who }]]$
S-structure: John wondered $[_{CP} \text{who } [_{IP} \text{Mary saw } t]]$

At D-structure the selectional restriction imposed by the matrix verb *wonder* is not satisfied, since the embedded clause is not an illegitimate representation for a question. Even if we assume some abstract complementizer C with the feature [+WH] heading the embedded CP, which requires a *wh*-phrase in its Spec (Rizzi (1991)), the Projection Principle is still violated at D-structure. In this case, the selectional restriction of the [+WH] C is not satisfied until S-structure.

Chapter 2

Syntactic Verb Movement and Bounding Theory

2.1. Introduction

Possibilities for forming questions and relativization vary from language to language. On the one hand, languages may differ as to whether or not they allow a gap in a position that normally requires a noun phrase to appear to be related to a *wh*-phrase occurring somewhere else in the sentence, in other words, whether or not the *wh*-phrase has moved out of its base-position. Whereas *Wh*-movement must occur (in constructions with one *wh*-phrase) in languages like English and Dutch, it need not in those like Chinese and Japanese. On the other hand, languages may differ in yet another way. They may vary with respect to the distance between the moved *wh*-phrase and the the position from which it moves.

In this chapter, I propose a theory of bounding according to which there are two parameters that particular languages may set the values positively or negatively. I argue that bounding theory must take into account the effect of head-movement in that some bounding domain can be subsumed under another if their heads are morphologically merged. Although very few languages have VP as a bounding domain, evidence can be found to show that it can be bounding in general, and that in cases where the bounding effect is apparently lacking are to be accounted for by head-movement. In this conception of bounding theory, a proliferation of functional projections would impose no additional bounding constraints.

The chapter is organized as follows. In section 2.2, we briefly review the empirical

b. La nuova idea di Giorgio, [_{CP} [di cui] [_{IP} immagino
 [_{CP} che cosa [_{IP} pensi *t*]]], diverrà presto di pubblico dominio.

‘Giorgio’s new idea, of which I imagine
 what you think, will soon become known to everybody.’

c. *Tuo fratello, [_{CP} [a cui] [_{IP} temo
 [_{NP} la possibilità [che abbiano raccontato tutto *t*]]], ...

‘Your brother, to whom I am afraid of
 the possibility that they told everything, ...’

(2) a. Giorgio’s new idea, [_{CP} [about which] [_{IP} I believe
 [_{CP} *t*’ [that [_{IP} you have talked to Maria *t*]]],
 will soon become known to everybody.

b. *Giorgio’s new idea, [_{CP} [of which] [_{IP} I imagine [_{CP} what [_{IP} you think *t*]]]],
 will soon become known to everybody.

c. *Your brother, [_{CP} [to whom] [_{IP} I am afraid of
 [_{NP} the possibility [that they told *t* everything]]], ...

Clearly, if the bounding nodes in Italian are NP and S (=IP), namely exactly those that Chomsky (1973) suggests for English, then the example in (1b) should violate Subjacency. The movement in this particular case crosses two bounding nodes, namely, the two IPs.

The distances over which extraction takes place in the examples in (1c) and (2c) are apparently the same, and both examples are ungrammatical, in contrast to the pair (1b) and (2b). NP thus seems to be bounding in both languages².

²For Rizzi and other early works, noun phrases are assumed to be projections of N.

Rizzi (1978) suggests that whereas S (=IP) is a bounding node in a language like English, as proposed by Chomsky, in a language like Italian S (=CPs), not S, is bounding (cf. also Sportiche (1981) for French). This account for the difference between English and Italian with respect to extraction is quite elegant since the contrast between (1b) and (2b) follows immediately from this parametric choice of bounding nodes.

However, to the extent Rizzi's analysis is empirically correct³, we might ask the following questions:

- (A) Is the difference between IP-bounding and CP-bounding due to some intrinsic properties of IP and CP? If so, how do they bear on the property of being bounding? Specifically, what is the difference between IP and CP that makes it possible for particular languages to choose one as bounding node, but not the other?
- (B) There are surely many differences between the English-type languages and those of Italian-type, why is it that both of them choose NPs as bounding nodes (cf. (3))?
- (C) VP is not bounding in both English and Italian. Why is that so? Is there a language in which VP is bounding?
- (D) What about categories other than IP, CP and NP, are they bounding? Why or why not?
- (E) Are there some combinations of bounding nodes that no natural language may

³The problematic case in the grammatical contrast in the examples in (i), which differ minimally with respect to the determiner:

- (i) a. Who did you see a picture of *t* ?
b. *Who did you see the picture of *t* ?

There seems to be no natural way to account for this contrast.

have? Why is that the case? Can we in a principled way predict what are the possible combinations and what are not?

Unless we have principled answers to these questions, a bounding theory that stipulates particular choices of bounding nodes in particular languages does not seem to have much explanatory power. Such a theory can obviously posit some arbitrary choice of bounding nodes precisely to yield the desired result. With this conceptual issue in mind, we will seek some answers to these questions in the following sections by articulating a more elaborate theory of bounding that not only has none of the conceptual problems we just raised, but also has a wider empirical coverage.

2.3. Analysis for Bounding Variations

Taking the differences between English and Italian with respect to bounding as the point of departure, I will first propose a theory of bounding according to which there are two parameters defining bounding domains, and then show how the idea accounts for the observed differences in the two languages. We will discuss the apparent lack of bounding effect in these two languages.

2.3.1. Bounding Parameters

Thanks to a lot of work done since Rizzi's proposal, answers to the questions posed above appear to be forthcoming. The answer to the question (D) seems to be positive generally. In fact, work by Koster (1978) and van Riemsdijk (1978) suggests that almost all categories are bounding, a notable exception being VP (cf. section 2.3.4). To avoid language-specific stipulations of choice of bounding nodes, let us take Chomsky's (1986b) notion of blocking category (BC) (defined in section 1.5.6) as a working hypothesis:

- (3) Every maximal projection is bounding, unless the effect is voided.

where the *unless*-clause in (3) is subject to parametric variations. If we have some prin-

ciplered way to void the bounding effect of maximal projections, then we would have an explanation for the question (E).

Law (1990) suggests that languages may void the bounding effect of maximal projections in one of two ways: (i) lexical selection, or (ii) functional selection. By lexical selection is meant complement to an X° lexical category (i.e. those categories that are definable in terms of $[\pm N, \pm V]$, cf. section 1.4.1), and by functional selection is meant complement to an X° functional category. If we set up the bounding parameters as $[\pm \text{lexical bounding}]$ and $[\pm \text{functional bounding}]$, with $[\text{+lexical bounding}]$ meaning complement to a lexical category is bounding (i.e. the bounding effect is voided by a lexical category), and $[\text{-lexical bounding}]$ meaning complement to a lexical category is not bounding (i.e. the bounding effect is voided by a lexical category), and similarly for $[\pm \text{functional bounding}]$, then these two parameters partition the class of possible languages with respect to the bounding effect of maximal projections into exactly four. As we will see in this chapter, this strong empirical prediction appears to be borne out.

However, there is a minor conceptual problem with the working hypothesis in (3), which says that maximal projections are bounding by default. If this is correct, then it is not clear what effect the parameters $[\text{-lexical bounding}]$ and $[\text{-functional bounding}]$ have. The results of setting the negative values of the two parameters would be exactly the same as not setting them. An improvement over this conceptual problem would simply be to eliminate the working hypothesis in (3). That is, maximal projections do not have intrinsic property of being bounding or not bounding, but the setting of the parameters to the negative values would make the (relevant) projections non-bounding, and the positive values would make them bounding. In other words, the positive value turns on the bounding effect, and the negative one turns it off. With this conception of bounding theory, let us now first see how clausal projections have a bounding effect on extraction.

2.3.2. Boundedness of Clausal Projections

Suppose a language like English sets its bounding parameters as [–lexical bounding] [+functional bounding], then the fact that IP is bounding follows immediately, since IP is a complement to the functional category C.

In the examples in (4), the two CP-complements to the verbs *think* and *wonder* respectively are not bounding because of the parameter [–lexical bounding] (the angle-bracketed nodes delimit the bounding domains):

- (4) a. The man [_{CP} who [_{<IP>} John thinks [_{CP} *t* that [_{<IP>} Bill gave a book to *t*]]]]
 b. ?*The man [_{CP} who [_{<IP>} John wondered [_{CP} who [_{<IP>} *t* gave a book to *t*]]]]
-

This is in contrast with the IPs, whose bounding effect is still in force. This is due to the setting of one of the parameters in the language as [+functional bounding], meaning the bounding effect is turned on by a functional category. In the examples in (4), the IPs are bounding since they are complements to the functional category C (*that* or a phonetically null complementizer), in whose Specs a *wh*-phrase occurs.

In (4a), the movement of the *wh*-phrase *who* involves crossing only one bounding node at a time, observing subadjacency. The movement of the *wh*-phrase *who* to the Spec of the upper CP in (4b), however, crosses two bounding nodes, namely, the two angle-bracketed IPs. The example is thus ruled out by subadjacency.

Let us now turn to Italian. The language takes the option whereby the bounding effect of complements to a lexical category is turned on by the parameter [+lexical bounding], and that of those to a functional category are turned off by the parameter [–functional bounding]. Thus, in the examples in (5), the bounding effect of the CPs is turned on by virtue of being complements to the lexical category V, and that of IPs is turned off by virtue of being complements to the functional category C (*che* ‘that’ or an empty complementizer in whose Spec a *wh*-phrase *chi* occurs):

- (5) a. Questo incarico, [_{CP} *O* che [_{IP} non. credo [_{<CP>} *t* che [_{IP} Maria possa avere indovinato [_{<CP>} a chi [_{IP} affiderò *t t*]]]], ...
- ↓
- ↑
- ‘This task, that I don’t think that Maria might have guessed to whom I will entrust, ...’
- b. *Questo incarico, [_{CP} *O* che [_{IP} non so proprio [_{<CP>} chi [_{IP} *t* possa avere indovinato [_{<CP>} a chi [_{IP} affiderò *t t*]]]], ...
- ↓
- ↓
- ‘This task, that I really don’t know who might have guessed to whom I will entrust, ...’

The grammaticality of the Italian example in (5a) is not surprising, since CP is bounding, the movement of the relative clause operator *O* (Chomsky (1977, 1982), cf. Chapter 5 for a discussion operators) to the Spec of the upper CP crosses only one bounding domain at a time, namely, the angle-bracketed CPs, even though two IPs are crossed. The example in (5b) is ungrammatical, since the movement of the operator *O* crosses two CPs in one step, violating subadjacency.

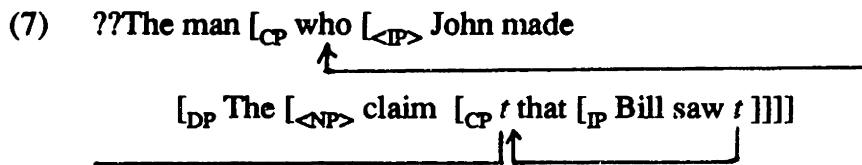
2.3.3. Boundedness of Nominal Projections

Works on the structure of noun phrase by Barwise and Cooper (1981), Szabolcsi (1983), Abney (1987), and many others now suggest an answer to the question in (B). In these works, noun phrases are not projections of the category N (Chomsky (1957)), as in (6a), but are actually those of the category D, the determiners, as in (6b) (intermediate levels of projection are omitted for simplicity):

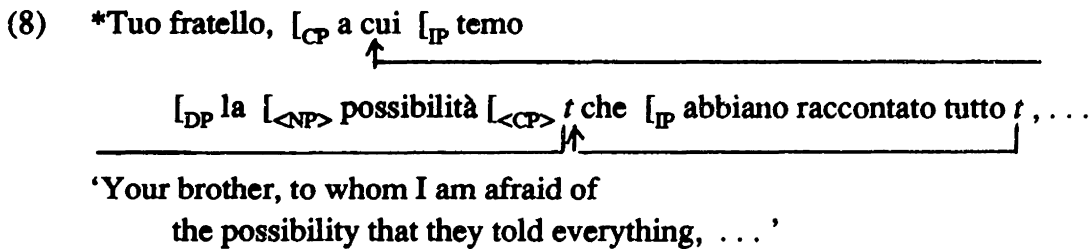
- (6) a. [_{NP} Det N] b. [_{DP} D NP]

The fact that noun phrases are bounding in both English and Italian is now accounted for as follows.

In a language like English, the bounding effect of DP is turned off by lexical selection (by the verb), but NP is still bounding since D does not have the capacity to do so:



In a language like Italian, however, the verb does not void the bounding effect of DP, D does so to NP, so DP is bounding in this language:



The net effect is that nominal projections are bounding in both languages. Technically, the bounding nodes in the two language-types are different: NPs in the English-type languages, and DPs in the Italian-type.⁴

The questions in (D) can now be answered more precisely. All maximal projections are potentially bounding, but depending on the positions where they occur, and the parameters that the particular language sets, the bounding effect can be in force or not. The questions in (A) can also be addressed. The difference between IP-bounding and CP-bounding is not due to some intrinsic properties of IP and CP, which do not directly bear on their boundedness. In fact, quite generally, the intrinsic nature of a category is irrelevant to its property of being bounding. Whether a maximal projection is bounding or not depends on complementation and that setting of the parameters.

⁴There is a question whether the Spec of DP can be used as escape hatch. If Abney (1987) is correct in that possessors appear in this position, as in (i), then this option is not available for movement out of DPs:

(i) [_{DP} John ['s [_{NP} book]]]

2.3.4. Boundedness of VP

VP appears to be problematic for more than one module of grammar. If VP is bounding, then a simple sentence like (9) would be predicted to be ungrammatical since the *wh*-phrase crosses more than one bounding node on the way to the matrix clause: an IP and a VP.

(9) [_{CP} What [did [_{IP} John [_{VP} see *t*]]]]

To get around this problem, on the one hand, Lasnik and Saito (1989) simply stipulate that VP is not a barrier, both for bounding and government. On the other hand, Chomsky (1986b) suggests that a *wh*-phrase may adjoin to VPs when it undergoes movement:

(10) [_{CP} What [_C did [_{IP} John [_{VP} *t'* [_{VP} see *t*]]]]]

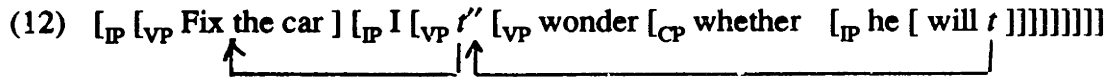
On the assumption that a maximal projection may comprise multiple segments as defined in May (1985), and that being dominated by a segment of a category does not constitute as being dominated by that category, the step from *t* to *t'* in (10) does not cross any maximal projection. The step from *t'* to the Spec of the matrix CP crosses only one bounding node, namely, IP. The issue of boundedness of VP with respect to extraction out of VP is thus resolved.

However, there are some indications that adjunction to VP should not be allowed. Consider the an example of VP-fronting in English in (11). The grammatical status of the example seems to be a weak subjacency violation⁵:

(11) ?? [Fix the car] I wonder whether he will *t*

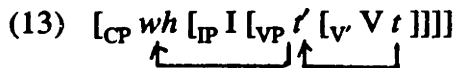
⁵It is not clear how proper government of the VP-trace is obtained in (11) (cf. the S-structure in (24)) in the conjunctive formulation of proper government. Antecedent-government clearly fails here.

Thus, the trace of the fronted VP thus must be properly governed; otherwise, a violation of the ECP would result. Suppose that *whether* is in [SPEC, CP] (cf. fn , section 4.2.1). Within the disjunctive formulation of the proper government, Chomsky (1986b) suggests that in the S-structure in (24) for the example in (11), the initial trace *t* is θ -marked by INFL (occupied by the modal *will*), which then results in the satisfaction of one of the two conditions on proper government (i.e. θ -government, cf. section 1.6.5):

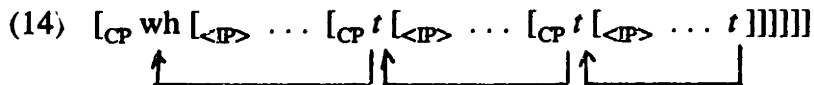


It turns out that VP-adjunction is inconsistent with the assumption that adjunction to arguments is not permitted for theta-theoretic reasons (Johnson (1985)), a supposition from which the impossibility of adjunction to argument NPs and CPs follows. VP-adjunction should thus not be permitted on the same grounds. If this is correct, then we do not have at our disposal the method of VP-adjunction to get around the subjacency condition. In fact, as we will see in the next section, facts about extraction in Welsh suggests that VP can be bounding and the bounding effect cannot be circumvented by VP-adjunction.

Instead of VP-adjunction, it may be that VPs, just like IPs do, have an escape hatch along the lines suggested by van Riemsdijk (1978) for PPs. So movement of a complement out of VP proceeds through a Spec position, as was also suggested in recent work by Dominique Sportiche (MIT talk, March 1990). The movement from a base-generated position from within *V'* to the Spec of the nearest CP thus involves two steps:



However, even if we assume that there is an escape hatch in VP, it would not help for the following two reasons. First, consider the escape hatch in extraction out of a clausal complement, schematically represented in (14):



An escape hatch is of help only if it can serve as the landing site after a movement crossing a bounding node, and crucially the node that immediately dominates the escape hatch must not be bounding. In (13), the movement from t to t' crosses no bounding node, but the problem is that VP is still bounding in a language like English, which turns on the bounding effect of maximal projections by functional selection (by the parameter [+functional bounding]). Second, in an Italian-type language, VP is not bounding at any rate since the effect is turned off by the functional category INFL. In this case, there is no motivation for an escape hatch in VPs. In sum, an escape hatch in VPs either does not help, as in English, or is redundant, as in Italian.

In the discussion of A-chains created by V-to-I movement in which antecedent-government, but not lexical government, of the verbal trace is desired, Chomsky (1986b) suggests that once V has moved to INFL, forming a V_I , INFL is lexicalized, hence can L-mark VP:

(15) ... [_{I'} V_I [_{VP} t_i]]

L-marking

VP is now no longer a blocking category, V_I then lexically governs the verbal trace. We might want to extend this idea to bounding theory. That is, we might assume that V_I turns off the bounding effect of VP too when it moves to INFL.

Unfortunately, evidence from comparative syntax seems to indicate that this might not work. Consider the difference between English and French with respect to verb movement. If Emonds (1978) is correct in that there is V-to-I, not I-to-V, movement in French, and the reverse is true in English, then we would expect that VP in English is bounding, but that in French is not. This is contrary to facts in the two languages: VP is bounding in neither language. We are back to the problem of boundedness of VP. In the next section, I suggest that the problem of the boundedness of VP be circumvented by head-movement.

2.4. Defining Bounding Domains: Head-movement

In this section, I will first bring up data from Welsh to show that VP can be bounding in general, and that in order to account for extraction facts in this language, we must assume structure-preservation as a constraint on successive-cyclic movement. I argue that cases where VP is apparently not bounding are due to the effect of head-movement on defining bounding domains. We will end this section with a discussion of how this conception of bounding fits into syntactic theories that assume a proliferation of functional categories.

2.4.1. Clause Structure and Extraction in Welsh

Before we get into our main concerns in this section, it is necessary to have a look at clause structure and extraction in Welsh, since they have some crucial bearing on verb movement.

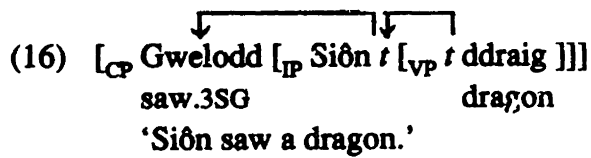
2.4.1.1. VP-internal Subject Hypothesis

Sproat (1985) suggests that the surface VSO in Welsh be derived from the underlying SVO order by verb movement to the left of the clause. In present terms, if subjects are in [SPEC, IP], then verb movement is to C¹:

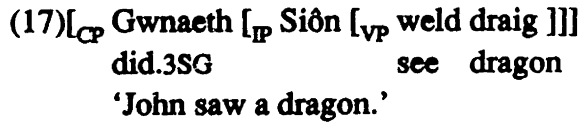
⁶The well-known mutation paradigm is as follows (Sadler (1988)) (Unless otherwise specified, the Welsh data are from literary Welsh):

(i)	ROOT	LENITION	NASALIZATION	SPIRANTIZATION:
	r	b	mb	ph
	t	d	ndh	th
	c	g	ng	ch
	d	dd	n	
	g	—	ng	
	ll	l		
	rh	r		
	m	f		

Cf. Harlow (1989) and Sadler (1988) for a discussion of the environments in which the mutation occurs.



This assumption seems reasonable given that when there is an auxiliary, the subject is to the left of the (non-finite) main verb, which I assume is in its base-position:



From the perspective of comparative syntax, the suggested clause structure is not very appealing. Without further movement, the representation of a declarative sentence would be just like those in (16) and (17), a structure with the finite verb in the first position. It is not uncommon among languages to have finite verbs in C in declaratives, in fact many Germanic languages like German and Dutch do (cf. Chapter 3). However, the Specs of root-clause declaratives in these languages are filled with some constituent. If there is a way to represent the examples in (16) and (17) not as verb-first CP declaratives, but as IPs, then we can maintain a very simple semantic interpretation rule, namely, only root-clause CPs with unfilled Specs can be interpreted as direct yes-no questions. We can perhaps sustain the claim that no language may have CPs with unfilled Specs as matrix questions. I would like to argue that there are good reasons to think that in Welsh VSO surface word order for declaratives has an IP-structure, not a CP, as suggested by Sprout, however. The reasons have to do with theories of clause structure, subjacency and proper government. We will discuss the first two reasons in this section, and the last one will be dealt with in section 4.2.3.

Suppose subjects originate in the Specs of VPs universally, as suggested by Kuroda (1985), Kitagawa (1986), Fukui and Speas (1986), Koopman and Sportiche (1988) among many others. Assuming that subjects must raise to the [SPEC, IP] for Case-checking (Chomsky (1986b, 1989)), I would like to propose that they parametrically raise

to this position: either at S-structure, or at LF. They raise to the [SPEC, IP] at S-structure in languages like English and French, but at LF in languages like Welsh. On this view, then, not only is the D-structure representation for a sentence uniform universally, the LF representation in Welsh and English would be exactly the same, despite their superficial word-order difference at S-structure where V raises to INFL in Welsh⁷ (Harlow (1981)), and INFL lowers to V in English (indices are used to indicate the position from which a phrase has moved):

- (18) a. S-structure: [_{IP} darllodd_I+I [_{VP} Siôn [*t* y llyfr]]]
 read.3SG the book
- b. LF: [_{IP} Siôn [darllodd_i+I [_{VP} *t* [*t*_iy llyfr]]]]
 'Siôn read the book.'
- (19) a. S-structure: [_{IP} John [*t* [_{VP} *t* [I+read the book]]]]
- b. LF: [_{IP} John [I+read [_{VP} *t* [*t* the book]]]]

Conceptually, it is quite appealing to have a uniform D-structure representation cross-linguistically, and to derive the different surface orders among languages from general principles of the grammar. As we will see in section 2.4.2.2, the view that subjects must raise to [SPEC, IP] for Case-checking has a desirable consequence for bounding theory.

One advantage of this view of clause structure is that the pre-sentential particle *a* in questions in formal Welsh can occupy the C position, if the finite verb is in INFL (the example is from Jones and Thomas (1977)):

⁷There is a pre-sentential particle *y* in declarative sentences (which surfaces as *yr* in (i)):

- (i) Yr oedd Siôn yn falch o Mair.
 prt was prt proud of
 'Siôn was proud of Mair.'

The particle drops if the following verb begins with a consonant as in the examples in (18). I assume the pre-sentential particle in declaratives is part of the verb.

- (20) A oedd Mair yn dadlau am y gêm efo ei brawd?
 Q was prt argue about the game with her brother
 ‘Was Mair arguing about the game with her brother?’

In colloquial Welsh, however, the presentential particle *a* is not necessary to indicate a question. The word order is exactly like that in a declarative:

- (21) a. $\left[\begin{array}{c} \downarrow \quad \downarrow \\ \text{CP} \text{ Mae } \left[\begin{array}{c} \downarrow \\ \text{IP } t \left[\begin{array}{c} \downarrow \\ \text{VP } \text{ John } \left[\begin{array}{c} \downarrow \\ t \text{ yn } \text{ yr } \text{ ardd } \end{array} \right] \end{array} \right] \end{array} \right] \end{array} \right]$
 is in the garden
 ‘Is John in the garden?’
- b. $\left[\begin{array}{c} \downarrow \quad \downarrow \\ \text{CP } \text{ Welodd } \left[\begin{array}{c} \downarrow \\ \text{IP } t \left[\begin{array}{c} \downarrow \\ \text{VP } \text{ John } \left[\begin{array}{c} \downarrow \\ t \text{ y } \text{ ddamwain } \end{array} \right] \end{array} \right] \end{array} \right] \end{array} \right]$
 saw.3SG the accident
 ‘Did John see the accident?’

I assume that the finite verb move to string-vacuously to C.

2.4.1.2. *Wh*-movement in Welsh

Consider now some simple cases of extraction in Welsh. It is possible to extract the object of a verb to the local [SPEC, CP] if the construction has only one verb:

- (22) a. Beth a ddarllenodd Siôn?
 what prt read.3SG
 ‘What did Siôn read?’
 b. Beth a welodd Siôn?
 what prt saw.3SG
 ‘What did Siôn see?’

Before we go on to see further facts about extraction in Welsh, let us now see what the structure of an interrogative looks like in this language.

Harlow (1983) argues that on the basis of facts about coordination in Welsh, *a* in the examples in (22) should not be treated as a complementizer, but as a pre-verbal particle, forming a constituent with the verb (cf. also Sells (1984) for Irish). Unlike English complementizers like *that* in a complement clause, *a* must be repeated in the second conjunct of a coordinate structure:

- (23) Y llyfr [a ddarllenodd] ac [*(a) fwynheuodd] Emrys
 the book prt read.3SG and prt enjoyed.3SG
 'The book that Emrys read and enjoyed'

- (24) John said that Mary left and (that) Bill stayed.

The same pattern obtains with the other pre-sentential particle *y* (Harlow (1983)):

- (25) Dwed Siôn [y bydd Emrys yn canu] ac [*(y) bydd Mair yn dawnsio]
 says prt will-be prt sing and prt will-be prt dance
 'John says that Emrys will be singing and that Mary will be dancing.'

- (26) Dywedodd Siôn [y darllenai] ac [*(y) mwynheuai] Emrys y llyfr
 said prt would-read and prt would-enjoy the book:
 'John said that Emrys would read and would enjoy the book.'

The coordination facts about the particles *a* and *y* are not conclusive, however. In most dialects of French, the uncontroversial complementizer *que* in French must be repeated in each conjunct. Yet, there is no reason to think that it forms a constituent with the subject:

- (27) Jean a dit [que Marie est partie] et [*(que) François est arrivé]
 has said that is left and that is arrived
 'Jean said that Mary left and that François arrived.'

The same pattern obtains for coordination with *de*, which according to Kayne (1981a) is a infinitival complementizer:

- (28) Jean a essayé [de venir plus tôt] et [*(de) partir plus tard]
 has tried come more early and leave more late
 'Jean tried to come earlier and to leave later.'

Nothing except clitics may intervene between the particles *y* and *a* and the finite verb (Sadler (1988), examples are from Jones and Thomas (1977)):

- (29) a. Pwy a 'm gwelodd neithiwr?
 who prt me saw.3SG last night
 'Who saw me last night?'
 b. *Pwy a 'm neithiwr welodd?
 'Who saw me last night?'
 c. Pwy a welodd fi neithiwr?
 who prt saw.3SG me last night
 'Who saw me last night?'
 d. *Pwy a neithiwr welodd fi?
 who prt last night saw.3SG me
 'Who saw me last night?'

But this fact does not seem to commit us to the idea that these particles form a constituents with the verb. In West Flemish (spoken in West Flanders between Knokke-Heist and Bruges, Belgium), nothing except clitics may intervene between the complementizer and the subject; yet, there is no reason to think that they form a constituent (Haegeman (forthcoming)):

- (30) a. Da Marie gisteren doa da kleed gekocht eet.
 that yesterday there that dress bought has
 'That Marie bought that dress there yesterday.'
 b. Da-et Marie gisteren doa gekocht eet.
 that-it
 'That Marie bought it yesterday.'
 c. *Da gisteren/doa da kleed gekocht eet.
 'That Marie bought that dress yesterday/there.'

As we will see in the section 2.4.2.4, assuming that the particle *a* as a complementizer has a desirable consequence for theory of bounding.

It thus appears that if the S-structures of the examples in (22) are as in (31), then we can assimilate the presence of the particles *a* and *y* in main clauses to the rule of *do*-support followed by I-to-C movement in English, namely, the head of a root-clause CP must be filled (cf. section 5.7):

(31) a. [_{CP} Beth [a [_{IP} ddarllenodd [_{VP} Siôn [t t]]]]]

b. [_{CP} Beth [a [_{IP} welodd [_{VP} Siôn [t t]]]]]

(32) a. [_{CP} What [did [_{IP} you [_{VP} see t]]]]

b. * [_{CP} What [[_{IP} you [_{VP} saw t]]]]

Returning now to some further facts about extraction in Welsh. As the grammaticality of the examples in (22) shows, it is possible to move the object of a verb to the local [SPEC, CP], if the clause has only one verb. However, it is not possible to extract it long-distance:

(33) a. *Beth y dywedodd Siôn y darllenai Mair?
 what prt said.3SG prt would-read

‘What did Siôn say that Mair would read?’

b. *Beth y dywedodd Siôn y mwynheuai Emrys?
 what prt said.3SG prt would-enjoy

‘What did siôn say that Emrys would enjoy?’

In these cases of long-distance extraction, a resumptive pronoun must be used:

(34) a. Beth y dywedodd Siôn y darllenai Mair ef?
 what prt said.3SG prt would-read it

‘What did Siôn say that Mair would read?’

b. Beth y dywedodd Siôn y mwynheuai Emrys ef?
 what prt said.3SG prt would-enjoy it

‘What did siôn say that Emrys would enjoy?’

In the view of Welsh clause structure suggested, then the structures for the examples in (33) would be as in (35):

(35) a. * [_{CP} Beth [y [_{IP} [dywedodd [_{VP} Siôn [t
 [_{CP} t [y [_{IP} darllenai [_{VP} Mair [t t]]]]]]]]]]]]]
 ‘What did Siôn say that Mair would read?’

- b. * $[_{CP} \text{Beth } [_{IP} \text{dywedodd } [_{VP} \text{Siôn } [t]]]]$
 $[_{CP} \text{y } [_{IP} \text{mwynheuai } [_{VP} \text{Emrys } [t]]]]]$
 'What did siôn say that Emrys would enjoy?'

Given that movement to the Spec of the embedded CP is possible:

- (36) 'Dwi 'n gwybod $[_{CP} \text{beth } [_{IP} \text{ddarllenodd } [_{VP} \text{Siôn } [t]]]]]$
 am prt know what prt read.3SG

it must be that the movement to the local [SPEC, CP] in (35) is possible, and that the ungrammaticality of the examples in (33) must then be due to the movement to the matrix clause.

The impossibility of the examples in (33) (cf. the structure in (35)) are quite unexpected, given that extraction from the original argument position to the local [SPEC, CP] is possible, and that there is only one maximal projection intervening between the Spec of the embedded CP and the matrix clause. An ECP account appears implausible, since the extraction site is not embedded inside a *wh*-island, the configuration that typically induces ECP violations. A comparison of the structures in (35) with the structures for similar examples in English should convince us that an ECP account is not on the right track:

- (37) a. $[_{CP} \text{What } [_{IP} \text{did } [_{IP} \text{John say } [_{CP} \text{that } [_{IP} \text{Mary see } t]]]]]$
 b. $[_{CP} \text{What } [_{IP} \text{did } [_{IP} \text{John say } [_{CP} \text{that } [_{IP} \text{Mary read } t]]]]]$

With the theory of bounding having two parameters, if the values for the parameters are set differently in the two languages, then the ungrammaticality of the examples in (33) would seem plausibly due to subjacency.

Given the grammaticality of (31), the movement of the object to the local [SPEC, CP]

must not cross more than one bounding barrier (=node. We will formally define bounding barriers later). Moreover, since the first move in (31) is possible, just like that in (36), it must then be that the move from the Spec of the embedded CP to the matrix clause in (31) crosses at least two bounding barriers. The conclusion about bounding domains in Welsh is clear:

- (38) CP is bounding, and that either IP or VP (but not both) is bounding in the structures in (35)-(36).

We now proceed to see that AP, PP, DP projections are also bounding in Welsh, and return to the boundedness of VP and IP.

It is impossible to extract out of AP, PP, and DP projections with a possessor or a noun-complement structure⁸:

- (39) a. $[\text{CP } \text{Yr} [\text{IP} [\text{w} [\text{VP } \text{Siôn} [t [\text{AP } \text{yn falch} [\text{PP } \text{o Mair}]]]]]]]]$
 prt was prt proud of
 'Siôn was proud of Mair.'
- b. $*[\text{CP } \text{Pwy} [\text{yr} [\text{IP} [\text{oedd}_i [\text{VP } \text{Siôn} [t_i [\text{AP } \text{yn falch} [\text{PP } \text{o } t]]]]]]]]$
 who
 'Who was John proud of?'
- (40) a. $[\text{IP} [\text{Siaradasoch} [\text{VP } \text{chwi} [t \text{ am } \text{y llyfr} [\text{PP } \text{a Siôn}]]]]]]$
 talked.2PL you about the book with
 'You talked about the book with Siôn.'
- b. $*[\text{CP } \text{Pwy} [\text{y} [\text{IP } \text{siaradasoch}_i [\text{VP } \text{clwi } t \text{ am } \text{y llyfr} [\text{PP } \text{a } t]]]]]]$
 who
 'Who did you talk about the book with?'
- (41) a. $[\text{IP} [\text{Clywodd} [\text{VP } \text{Siôn} [t [\text{DP } \text{y} [\text{NP } \text{newyddion}]]]]]]$
 heard.3SG prt news

⁸According to John Koch (personal communication), the example in (39b) can often be heard in colloquial Welsh.

- b. $*[{}_{\text{CP}} \text{Pwy} [{}_{\text{YR}} [{}_{\text{IP}} \text{hoffai}_i [{}_{\text{VP}} \text{Gwyn} [{}_{\text{t}} [{}_i \text{Emrys weld } t]]]]]]]$
 who
 ‘Who would Gwyn like Emrys to see?’

The examples in (45) and (46) are used to express the English translations in (39b) and (42b) with an inflected preposition and a possessive pronoun respectively:

- (45) $[{}_{\text{CP}} \text{Pwy} [{}_{\text{YR}} [{}_{\text{IP}} [{}_{\text{oedd}} [{}_{\text{VP}} \text{Siôn} [{}_{\text{t}} [{}_{\text{AP}} \text{yn} \text{falch} [{}_{\text{PP}} \text{ohono}]]]]]]]]]]$
 who prt was prt proud of.3SG.MASC
- (46) $[{}_{\text{CP}} \text{Pwy} [{}_{\text{Y}} [{}_{\text{IP}} [{}_{\text{gwelodd}} [{}_{\text{VP}} \text{Mair} [{}_{\text{ei}} \text{gar}]]]]]]]]$
 who prt saw.3SG his car
 ‘Whose car did you see?’

On the other hand, the ungrammatical examples in (40), (42)-(44) would become acceptable if a resumptive pronoun *ef* ‘him’ appears in the position of the object trace.

The evidence is inconclusive for subjacency, though, since it might have to do with the constraint on preposition-stranding. Nevertheless, in the absence of an explanatory adequate theory on preposition-stranding (cf. Appendix), the impossibility of having a gap inside APs, PPs and DPs in Welsh is perfectly consistent with a subjacency account according to which these projections are bounding in the language.

Like long-distant extraction, it is impossible to extract an object to the local [SPEC, CP] in clauses having an auxiliary in addition to a (non-finite) main verb in its base-position. A resumptive pronoun must be used:

- (47) a. $*\text{Beth } y \text{ mae } \text{Siôn } \text{yn } \text{darllen?}$
 what prt is prt see
 ‘What is Siôn reading?’
- b. $\text{Beth } y \text{ mae } \text{Siôn } \text{yn } \text{ei } \text{ddarllen?}$
 what prt is prt it see
 ‘What is Siôn reading?’

If we assume that the particle *yn* is part of the main verb (we will consider another pos-

sibility for *yn* in section 2.4.2.2), then the structure for the example in (47a) would be as in (48a), and that of (47b) would be like that in (48b) with the *wh*-phrase *beth* ‘what’ base-generated in an adjunct position, and the resumptive pronoun cliticizing to the non-finite verb (some rule of predication (Chomsky (1977)) would relate the resumptive pronoun to the *wh*-phrase):

- (48) a. * $[_{CP} Beth [y [_{IP} [mae [_{VP} t [_{VP} Siôn [yn darllen t]]]]]]]$
‘What is Siôn reading?’
- b. $[_{CP} Beth [y [_{IP} [mae [_{VP} t [_{VP} Siôn [yn ei darllen t]]]]]]]$
‘What is Siôn reading?’

If the presence of a resumptive pronoun or an inflected preposition in these cases is an indication that the constructions do not involve movement but have the structures in which the *wh*-phrase is base-generated in the matrix [SPEC, CP] and a pronoun in argument position (which subsequently cliticizes to the preposition or the verb of which it is an argument), then this is evidence that XP-adjunction for successive-cyclic movement (Chomsky (1986b)) is not available, at least in Welsh.

Thus, the ungrammaticality of (48a) would be explained as a violation of subjacency, if we assume that both IP and VP are bounding in this particular example. Recall that [SPEC, IP] cannot be used as an escape hatch since the position is reserved for raising of subjects at LF for Case-checking, thus the movement of the object from the base-position to the matrix clause crucially crosses (at least) an IP and a VP in one fell swoop. This is thus one advantage of assuming LF-raising of subjects.

We have the conclusion (38) that either IP or VP must be bounding, but both cannot be bounding in the examples in (35) and (36). In the theory of bounding with two parameters that I am suggesting here, a language would have the parameter [+functional bounding] if IP is not bounding. But the same parameter would also annul the bounding effect of VP, since it is also a complement to the functional category INFL. In other

words, the same parameter would either make them both bounding or both non-bounding. Thus, we cannot appeal to the bounding parameters to void the bounding effect of one of these two projections. I suggest presently that in fact Welsh is a language in which every maximal projection is bounding. That is, the language has the parameters [+lexical bounding] and [+functional bounding]. The impossibility of extraction out of APs, PPs, DPs confirms this claim. We return to cases like (35) and (36) where the bounding effect of a projection is apparently lacking in section 2.4.2.

2.4.1.3. On Successive-cyclic Adjunction and Structure-preservation

The impossibility of long-distance extraction of DPs indicates that the option of successive-cyclic adjunction for long-distance movement is not available in Welsh. However, facts about PP-extraction seem to contradict this claim. It is possible to extract PPs out of VP in constructions with an auxiliary, as well as over long distances:

(49) $[_{CP}$ Am beth $[y$ $[_{IP}$ $[$ mae $[_{VP}$ Mair $[$ yn dadlau efo ei brawd t $]]]]]$
 about what prt is prt argue with her brother
 ‘What is Mair arguing about with her brother?’

(50) $[_{CP}$ A bwy $[y$ $[_{IP}$ $[$ dywedodd $[_{VP}$ Siôn $[$ t
 to who prt said.3SG
 $[_{CP}$ yr $[_{IP}$ $[$ oedd $[_{VP}$ Mair $[$ yn siarad t $]]]]]]]]]$
 prt was prt speak
 ‘Who did Sôn say that Mair was speaking to?’

PP-pied-piping (Ross (1967)) then apparently behave differently with respect to long-distant extraction.

Suppose movement falls under the purview of Emonds’ (1976) Structure-Preserving Hypothesis, an assumption that holds at least of *Wh*-movement, NP-movement and head-movement in most theories:

(51) Structure-preserving Transformation:

A transformation or a transformational operation that introduces or substitutes a constituent C into a position in a phrase marker

held by a node C is called structure-preserving.

Notice that the structure-preserving constraint on successive-adjunction for long-distance movement would not be any more permissive than previously assumed. At worst, we can impose additional constraints on adjunction over and above structure-preservation (cf. Chomsky (1986b)). In fact, in some cases, the impossibility of successive-adjunction follows from general principles of grammar.

Because of Theta theory, DPs may not be base-generated as adjuncts. The option of XP-adjunction for successive-cyclic movement should then not be possible for DPs. This is an improvement over stipulation against adjunction to argument CP and DP¹⁰.

On the other hand, since PPs can be base-generated as adjuncts, they can move long-distance by XP-adjunction to positions where they can be independently generated. The DP/PP asymmetry with respect to long-distant extraction can thus be explained. To illustrate, consider the following derivations for the Welsh examples in (49) and (50):

(52) $[_{CP} \text{ Am beth } [_y [_{IP} t [_{IP} [_{\text{mae}} [_{VP} \text{ Mair } [_{\text{yn dadlau efo ei brawd } t}]]]]]]]]$

(53) $[_{CP} \text{ A bwy } [_y [_{IP} [_{\text{dywedodd}} [_{VP} t [_{VP} \text{ Siôn } [_t} [_{CP} t [_y} [_{IP} t [_{IP} [_{\text{oedd}} [_{VP} \text{ Mair } [_{\text{yn siarad } t}]]]]]]]]]]]]]]]]]]$

In (52), the PP first adjoins to the IP (the direction of adjunction is irrelevant), crossing only one bounding barrier, namely, the VP. It then moves on to [SPEC, CP], crossing one bounding barrier again. The two moves observe subadjacency. In (53), the PP first

¹⁰In fact, if the CED has no independent status (Chomsky (1986b)), then the theta-theoretic reason against adjunction to arguments would not give us the correct result in cases of extraction out of relative clauses, as it would rule out a derivation such that in (i):

(i) *Who did you see the man who likes t

As the relative clause CP and the modified NP are not in θ -positions, adjunction as indicated should be possible. As we will see in Chapter 5, only antecedent-government of the subject trace is at issue. The CP does not exclude the CP-adjoined trace, which would thus be able to antecedent-govern the subject trace. The derivation in (i) is not possible in a theory where adjunction to CPs in general is banned because of structure-preservation.

adjoins to the embedded IP, then to the Spec of the embedded CP. From there, it moves to adjoins to the matrix VP, and finally to the Spec of the matrix CP. It is easy to see that each move crosses no more than one bounding barrier, observing subadjacency. Thus, structure-preservation would explain the asymmetry between extraction of DPs and that of PPs in Welsh.

However, without the stipulation against adjunction to arguments, we must have some way to derive the impossibility of adjunction of PP to CP. Otherwise, we would incorrectly allow extraction of PP out of *wh*-islands. The grammatical status of the example in (54b) is at least a mild subadjacency violation:

- (54) a. $[\text{CP where } [\text{did } [\text{IP you put the books } t]]]$
- b. $?[\text{CP where } [\text{did } [\text{IP you } [\text{VP wonder } [\text{CP } t [\text{CP whether } [\text{IP John put the books } t]]]]]]]]$

If we can show that there are no base-generated adverbials as CP-ad adjuncts, then a derivation as that in (54b) would follow immediately from structure-preservation.

The data on the syntax of adverbials are not very clear, unfortunately. Some adverbials seems possible in an adjoined position to root-clause CPs, but not to relative clause CPs (cf. section 5.8 for a possible explanation for the ungrammaticality of the examples in (57)):

- (55) a. $[\text{CP Yesterday } [\text{CP who } [\text{did } [\text{IP you see } t]]]]$
- b. $[\text{CP In the park } [\text{CP who } [\text{did } [\text{IP you see } t]]]]$
- (56) a. $*[\text{CP Carefully } [\text{CP what } [\text{did } [\text{IP you read } t]]]]$
- b. $*[\text{CP Intentionally } [\text{CP what } [\text{did } [\text{IP you hid } t]]]]$
- (57) a. $*[\text{The man } [\text{CP yesterday } [\text{CP who } [\text{IP you saw } t]]]]$

- b. *The man [_{CP} in the park [_{CP} who [_{IP} you saw *t*]]]
- c. *The book [_{CP} carefully [_{CP} which [_{IP} you read *t*]]]
- d. *The book [_{CP} intentionally [_{CP} which [_{IP} you hid *t*]]]

Neither is it possible to adjoin an adverbial to an extraposed CP in a adjunct position:

- (58) a. It seems possible to Bill [_{CP} that John will leave tomorrow]
 b. *It seems possible to Bill [_{CP} tomorrow [_{CP} that [John will leave]

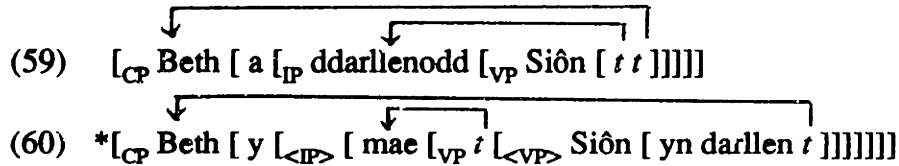
Although the question of why adverbial cannot be adjoined to a CP-adjunct in these cases remains to be answered, whatever constrains the adjunction sites of adverbials, structure-preservation will disallow movement to these same positions. The upshot is that successive cyclic adjunction to both argument and non-argument CPs would follow immediately without further stipulation.

2.4.2. Effects of Head-movement on Bounding Domains

In this section, we discuss the delimits of bounding domains as effected by head-movement. We will first return to the problem of boundedness of VP in Welsh, then see how a solution for it can be carried over to English and Italian. We consider two possibilities that might give us the desired results. The conceptual approach is that certain domains can potentially be bounding, and some others cannot. The bounding parameters suggested in the section 2.3.1 would then make them actually bounding (if set positively), or non-bounding (if set negatively). The problem of the boundedness of VP in general is quite acute. Regardless of the constructions in which it appears, VP is apparently not bounding in neither English nor Italian. Given that the two languages have exactly opposite values of the two bounding parameters, we thus cannot appeal to the settings of the parameters to make the bounding effect in force or not. The problem is all the more serious in Welsh. VP is sometimes bounding, sometimes not, depending on the environment in which it occurs.

2.4.2.1. Welsh VP

Recall from the last section that short distance extraction of the object to the local [SPEC, CP] as in (W4a), repeated here as in (59), is possible across both IP and VP in one step, but extraction of the object of the verb which stays in its base-position as in (W.3a), repeated here as in (60), is impossible:



The conclusion seems clear: VP is bounding in a case like (60), but not like one in (59). The difference between the structures in (59) and (60) is precisely the position of the finite verb. It has moved out of its projection in the former structure, but not in the latter. It thus appears that the boundedness of VP, and more generally, of a maximal projection, is dependent on the lexicality of its head.

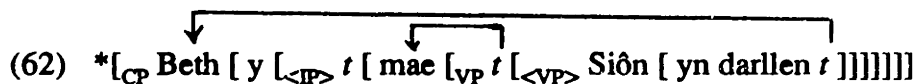
Suppose we define notion of bounding category as in (61), along the lines of Déprez' (1990) suggestion for defining government barriers (we will revise the definition later, and also return to the question of how the bounding category is related to Chomsky's (1986b) blocking category as well as the relationship between subjacency and the ECP in section 2.7):

- (61) γ is a bounding category for β iff
- (a) γ fails to exclude β ; and
 - (b) the head of γ is non-empty.

The positive values for the bounding parameters would turn a bounding category into a bounding barrier (=bounding node), and the negative values would make it a non-bounding barrier. Thus, the empirical claim embodied in the definition of a bounding category in (61) is that projections with an empty head can never be a bounding barrier in any language. The non-bounding nature of such projections is thus different from that which is turned off by the negative settings of the (relevant) parameters.

With this assumption, let us see when a VP in Welsh is bounding and when it is not. In (59), the verb has moved out of its projection, the VP is thus not a bounding category; therefore, the positive settings of the bounding parameters in Welsh could not effect the boundedness of VP in this case. IP is a bounding category, however. The [+functional bounding] parameter of the language would turn IP into a bounding barrier. Crossing only one bounding barrier, the movement of the object to the local [SPEC, CP] would observe subadjacency.

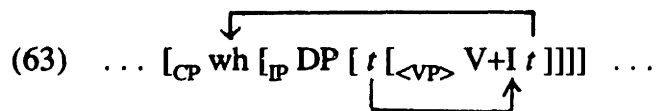
The impossibility of extraction of the object in (60) is as expected. The main verb stays in its base-position, and is thus a bounding category. The auxiliary moves to INFL, the upper VP would thus not be a bounding category, since the head of the VP is empty. Given the positive settings of the bounding parameters in Welsh, both the IP and the lower VP would be bounding barriers. If the object were to move out of the VP, it would cross two bounding barriers, violating subadjacency. Notice as well that the object inside the VP cannot make use of the Specs of VP and IP as escape hatches in (60). In other words, the following derivation is ruled out:



This is because these positions are reserved for the subject to make a transit or land in for Case-checking.

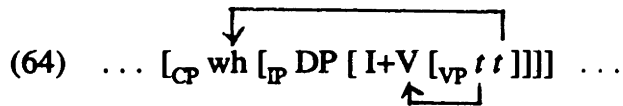
2.4.2.2. English and Italian VP

Let us turn now to English and Italian. Consider the schematic representation in (63) where the object moves to the local [SPEC, CP] from under the V':



For languages like English, INFL lowers to V at S-structure. The IP in (63) would now not be a bounding category, since its head is empty. Since English sets one of its parameters as [+functional bounding], VP would be bounding. Nonetheless, extraction

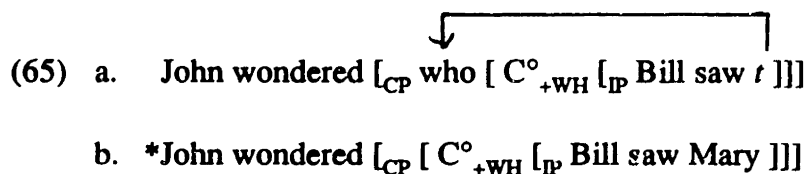
of the object to the local [SPEC, CP] would cross only one bounding barrier, namely, the VP. Subjacency is not violated. For languages like Italian in which V raises to INFL at S-structure, as in (64):



The VP in (64) would now not be a bounding category, since its head is empty. Hence, it cannot become a bounding barrier. But the IP is a bounding category. However, languages like Italian set one parameter as [-functional bounding], which turns off the bounding effect of IP. Movement of the object under V' as in (64) would thus cross no bounding barrier.

Despite its overall simplicity, the analysis does not quite work, however. According to (61), CP in (64) is would not be a bounding category, since its head is empty. Hence, it cannot be a bounding barrier. But the fact is that in languages like Italian, CP is bounding, even when it has an empty head. (Recall that Italian does not allow Doubly-filled COMP (Chomsky and Lasnik 1977)). One possibility is to assume that there is an abstract complementizer in the head position of an indirect question CP. The CP in (64) would then be a bounding category, which would become a bounding barrier in a language like Italian where the parameter [+lexical bounding] makes enforce the bounding effect.

In fact, Rizzi (1991) suggests that there is an abstract complementizer analogous to Baker's (1970) abstract Q morpheme in questions, which must be in a Spec-head relation with a *wh*-phrase (cf. section 5.7). This would explain why there is *Wh*-movement in embedded indirect questions:



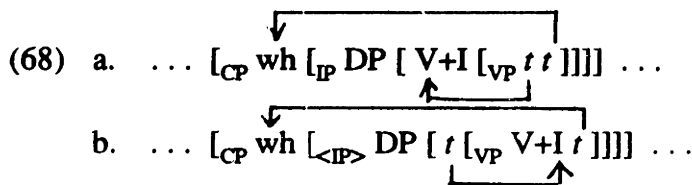
However, the grammatical contrast in (65) can be seen in a different light. Suppose we have a syntactic theory of interrogatives according to which the form of a non-yes-no question must have a *wh*-phrase c-commanding the rest of the clause (cf. section 5.7), then the contrast in (65) would also be accounted for without positing an abstract C° with the [+WH] feature. Thus, the viability of the formulation given in (61) crucially hinges on the independent existence of such abstract C° 's. Although we cannot reject this possibility a priori, let us now consider an alternative where such potential problem does not arise.

Suppose we simplify the notion of bounding category, as in (66), and add a condition on subsumption of bounding categories (to be augmented later) as in (67)¹¹:

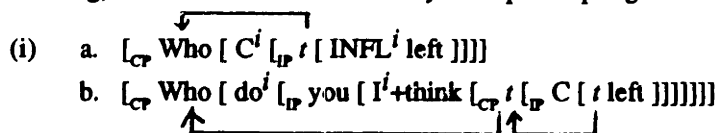
(66) α is a bounding category for β iff α fails to exclude β .

(67) The bounding category α is subsumed under the bounding category β iff β dominates α , and the heads of α and β are morphologically merged.

In other words, the definition in (66) is the base case, and that in (67) subsumes a dominated bounding category under a dominating one, if their heads are morphologically merged (cf. Law (1990). Specifically for verbal projection, cf. Marantz (1980), Jackendoff (1977), Kayne (1981a) for the suggestion that V is the head of S). With this assumption, let us see how the boundedness of VP is circumvented. Consider the schematic representations in (68):



¹¹The definition in (67) is close in spirit of Jasper's (1989) suggestion, which has a different conceptual motivation for unifying bounding and binding theories in some way, that the domain (for both bounding and binding) is extended from IP to CP by co-superscripting C and INFL, in cases like (i):

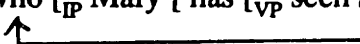


Regardless of the directionality of verb movement, the bounding category VP is subsumed under IP. For languages like Italian where verbs raise to INFL at S-structure, and one of the bounding parameters is [-functional bounding], the bounding effect would not be in force. Movement of the object to the local [SPEC, CP] as in (68a) would cross no bounding barrier. But the CP is still a bounding category, which becomes a bounding barrier by the parameter [+lexical bounding]. In languages like English, however, which set one of the bounding parameters as [+functional bounding], IP would be bounding. Since the movement of the object to the local [SPEC, CP] crosses only one bounding barrier, there is no subjacency violation in (68b). For convenience, we henceforth angle-bracket the upper XP in cases like (68) where the heads X° and Y° are morphologically merged to delimit the bounding domain, and use the notation XP/YP to indicate that the bounding category YP is subsumed under XP, which delimits the bounding category XP/YP.

This account of non-boundedness of VP does not have the arguably questionable assumption that INFL θ -marks VP. INFL does not seem to have argument structure the way verbs do. It also resolves the empirical difference between English and French with respect to verb movement. That VP is bounding in neither language is because V and INFL are amalgamated in both languages. The fact that they differ with respect to movement of V to INFL or of INFL to V is irrelevant. If this is correct, then the question in (C) now has an explanation.

2.4.2.3. Problems with English and Italian Auxiliaries

Although this conception of bounding domains might have some desirable consequences for theory of government (cf. section 2.6), it turns out that the definition of bounding category in (66) is empirically incomplete. Consider an embedded interrogative like the one in (69a):

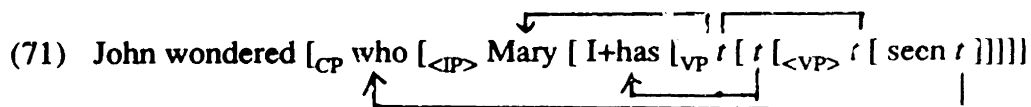
- (69) a. John wondered who Mary has seen ?
 b. John wondered [_{CP} who [_{IP} Mary [has [_{VP} seen *t*]]]]
- 

If the structure for the embedded clause in (69a) is that given in (69b), then the VP is a bounding category, since the verb has not merged with any head but stays in its base-position. Depending on one's assumption about auxiliaries, the VP that an auxiliary heads would be a bounding barrier or not. If we assume that it is a functional category, the VP it heads would be a bounding barrier (recall English is [+functional bounding]). With the IP also bounding, movement of the object to the local [SPEC, CP] would cross two bounding barriers, an incorrect result. If we assume that it is lexical (cf. Chomsky's (1986b) suggestion that V lexicalizes INFL when it moves there, and thus L-marks the VP), then it would not be bounding. However, the same assumption would make VP bounding in a language like Italian since it has the parameter [+lexical bounding]. The desired result is that it is bounding in neither language.

Suppose Zagana (1988) is correct in that constructions with auxiliaries have stacked VPs as structures, then the structure in (69b) would be something like (70), with raising of the auxiliary *has* to INFL (Emonds (1978), Pollock (1989)):



Although there is verb movement in (70), the lower bounding category VP is not subsumed under another bounding category. It has yet to merge with another head. Movement of the object would cross two bounding barriers: the IP and the lower VP. (Recall that we are assuming no VP-adjunction, by structure-preservation). As we saw in section 2.4.1.1, there are some reasons to assume VP-internal subject. The Spec position of the upper VP cannot be used as an escape hatch since the position is for the subject to make a transit on the way to [SPEC, IP] from the Spec of the lower VP:



It thus looks like that some further modification of the definition of bounding category is in order. Suppose we add another clause to the condition of subsumption of bounding categories, as in (72b) (clause (72a) is repeated here from (70) for convenience):

- (72) The bounding category α is subsumed under the bounding category β iff
- a. β dominates α , and the heads of α and β are morphologically merged; or
 - b. β immediately dominates α , α, β are of the same category.

That is, in a stacked VP structure, the uppermost VP delimit the bounding domain. The grammaticality of (70) can now be accounted for as follows. The uppermost VP is the bounding category for the stacked VP structure, by (72b). It is now subsumed under the bounding category IP because of verb movement to INFL, by (72a). Thus, the IP in the structure in (71), repeated here as in (73), would be the delimit of the bounding category IP/VP/VP, which is the only one bounding barrier, the result of having the parameter [+functional bounding] turning on the bounding effect of complements to a functional category:

- (73) John wondered [_{CP} who [_{IP} Mary [I+has [_{VP} t [_{VP} seen t]]]]]
-

Movement of the object from under the lower VP to the local [SPEC, CP] crosses only one bounding barrier, subadjacency is thus observed.

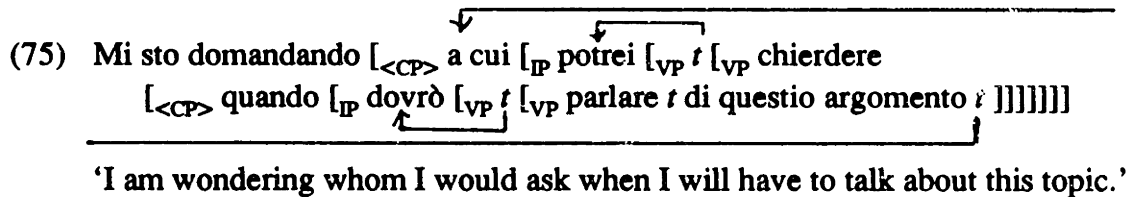
Consider now the mild ungrammaticality as a result of a subadjacency violation observed in (74a), with the structure as in (74b):

- (74) a. ?What have you wondered where John has read?
b. [_{CP} What [I+have [_{IP} you t [_{VP} wondered [_{CP} where [_{IP} John [I+has [_{VP} t [_{VP} read t]]]]]]]]]]
-

As in (73), there is only one bounding barrier in the embedded clause, namely, the embedded IP. Although the V+I complex is now in C of the matrix clause, the matrix IP is still the delimit of the bounding category IP/VP, by (72a). Since verb movement to C is substitution, there is no element in C that is merged with the V+I complex. It thus does not meet the condition for subsumption in (72a). The CP and the IP are not of the same category, hence the condition in (72b) is not met either. Consequently, the matrix bound-

ing category IP/VP is not subsumed under the CP. The IP in the embedded clause delimits the bounding category IP/VP/VP, since the dominated VP is subsumed under the dominating VP by (72b), which is in turn subsumed under IP by (72a). Thus, the movement of the *wh*-phrase *what* to the Spec of the matrix CP in (74) crosses two bounding barriers, namely, the matrix IP/VP, and the embedded IP/VP/VP.

A similar derivation can be seen in the Italian example in (75) (Rizzi (1978)):



The upper VPs in both matrix and embedded clauses in (75) delimit the bounding categories VP/VP. Due to verb movement, they are subsumed under IPs, which are the delimiters of the bounding categories IP/VP/VPs. However, since Italian has the parameter [-functional bounding], the bounding effect of the IP/VP/VPs are annulled. The movement of the *wh*-phrase *a cui* ‘(to) whom’ thus crosses only one bounding barrier, namely, the embedded CP.

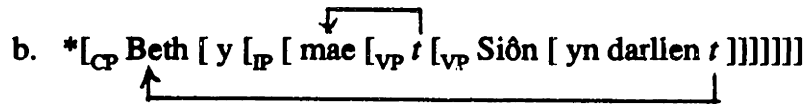
With head-movement, then, the delimits of bounding domains can vary. Specifically for verbal projections and those functional projections to which there is some sort of head-movement, the bounding effects of these maximal projections may be subsumed under other projections. The fact that VP is bounding in neither English-type languages nor Italian-type languages is thus closely related to the effects of head-movement.

2.4.2.4. Welsh Particles *yn*, *wedi*, *newydd* and *heb*

It turns out that the formulation in (72) requires an additional assumption about Welsh auxiliaries in order to account for facts about extraction in constructions involving auxiliaries. Unfortunately, there are some aspects of the grammar of Welsh that raise further questions that are beyond the scope of this work.

Recall from section 2.4.1.2 that the structure for an ungrammatical example like (76a) was assumed to be that in (76b):

- (76) a. *Beth y mae Siôn yn darllen?
 what prt is prt see
 'What is Siôn reading?'



In (76b), the lower VP is immediately dominated by another VP; therefore, according to (72b), the bounding category of the lower VP would be subsumed under the upper VP, which would be the delimit of the bounding category VP/VP. With verb movement to INFL, the bounding category VP/VP would in turn be subsumed under the bounding category IP, which would delimit the bounding category IP/VP/VP. Given that Welsh has the parameters [+lexical bounding] [+functional bounding], the bounding category IP/VP/VP would become a bounding barrier. Movement of the object from the lower VP to [SPEC, CP] would thus cross only one bounding barrier, violating no subadjacency. This is apparently an unacceptable result.

In the discussion on Welsh, I was not very precise about the categorial identity of the particle *yn*. Let us now explore the possibility that it heads its own projection. Judging from its interpretation, the particle *yn* seems to be a marker for Progressive (the verb after it is non-finite):

- (77) a. Darllenodd Siôn y llyfr.
 read.3SG the book
 'Siôn read a book.'
- b. Mae Siôn yn darllen y llyfr.
 be.3SG prt read the book
 'Siôn is reading a book.'

Other particles that are like *yn* in that they occur with the auxiliary *bod* 'be' and require the verb that follows it be in non-finite form are *wedi*, which marks Perfective (historically a preposition meaning 'after'), *newydd* 'just', and *heb* 'without':

- (78) a. Y mae Siôn wedi gweld draig.
 prt is prt seedragon
 'Sôn has seen a dragon.'
- b. Y mae Siôn newydd gweld draig.
 prt is prt see dragon
 'Sôn has just seen a dragon.'
- c. Y mae Siôn heb gweld draig.
 prt is prt see dragon
 'Sôn has not seen a dragon.'

As is the case with the particle *yn*, it is impossible to extract the object of a verb with which the particle *wedi* 'after', *newydd* 'just' and *heb* co-occur. A resumptive pronoun must be used:

- (79) a. Beth mae Siôn wedi *(ei) gweld.
 What is prt it see
 'What has Sôn seen?'
- b. Beth mae Siôn newydd *(ei) gweld.
 'What has Sôn just seen?'
- c. Beth mae Siôn heb *(ei) gweld.
 'What has Siôn not seen?'

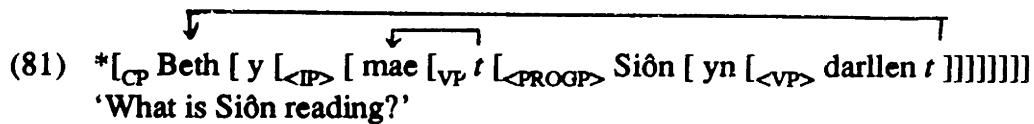
In contrast with the English and Italian auxiliaries, these particles do not take inflection. In other words, they do not occur in INFL. Given that they require the verb that follow them be in non-finite form, it seems that some kind of selectional restriction is involved here. These particles then have the property of being a head, namely, they select the specific morphology of their complements. If this is correct, then the structure for the example in (77b) must be like that in (80). For concreteness, let us call the projection that *yn* heads as PROGP (for Progressive phrase (cf. McCloskey (1983) for Irish), the exact name of the category is not crucial here):

- (80)
$$\begin{array}{c} \downarrow \\ \text{[}_{\text{IP}} \text{ [Mae [}_{\text{VP}} \text{ Siôn [} t \text{ [}_{\text{PROGP}} \text{ yn [}_{\text{VP}} \text{ darllen y llyfr] }]]]]]] \end{array}$$

 'Siôn is reading the book.'

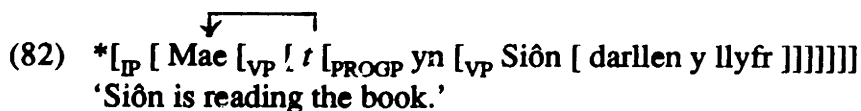
With PROGP intervening between the upper VP and the lower VP, subsumption of the

latter under the former is impossible. According to (72b), subsumption of one category under another requires immediate dominance. The upper VP does not immediately dominate the lower VP (cf. (72b)). The structure for the example in (76a) should now be as in (81):

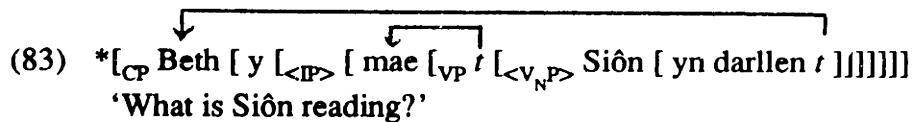


Movement of the object from the lower VP to [SPEC, CP] would cross the three angle-bracketed bounding barriers, violating subadjacency.

Although the account just sketched seems plausible, the structure in (80) raises a question of a different sort. Why does the subject appear in the Spec of PROGP, instead of the Spec of the lower VP, the position where it starts out at D-structure? In fact, if the subject remains in its base-position, the representation is ungrammatical:



One alternative is to assume that *yn* forms an X° with the verb, which traditional grammars call a verbal noun (V_N). It might be that the projections of such verbal nouns are not categorially identical to verbal projections, namely, they are V_N Ps, not VPs. Therefore, subsumption of bounding category as defined in (72b) does not apply. Consequently, there would then be two bounding barriers from the object position to the Spec of the matrix CP, as indicated in (81):



Movement of the object to [SPEC, CP] in (83) would cross two bounding barriers, violating subadjacency. A question that immediately arises is if the particle *yn* forms an X° with the verb. In an example with a pronominal clitic, the clitic appears between the particle and the verb:

- (84) Mae Siôn yn ei darllen.
 is prt it read
 'Siôn is reading it.'

Such cliticization is not allowed by the Lexical Integrity Hypothesis (Chomsky (1970), Bresnan (1972). Cf. also section 3.2.1.3). Notice that cliticization would not be a problem if *yn* heads its own projection PROGP.

In sum, although some difficult questions about Welsh grammar remain to be solved, it seems clear that head-movement has an effect on defining bounding domains.

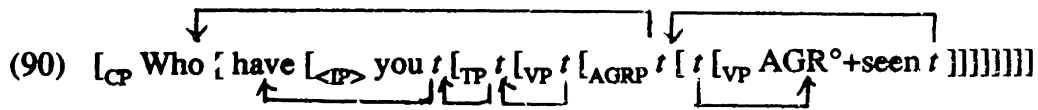
2.4.2.5. Boundedness of Functional Projections

It turns out that the conception of bounding theory we have been discussing has desirable consequences for syntactic theories in which there is a proliferation of functional categories.

Pollock (1989) proposes that the traditional IP-projection be composed of two separate projections, each has its own head: an AGRP, the maximal projection of subject agreement AGR (to avoid confusion and for ease of reference, we will continue to use the label IP for AGRP) and a TP (T for Tense). The structure in (86a) is proposed by Pollock where T takes IP as a complement, and that in (86b) is suggested by Belletti (1988, 1990) and Chomsky (1989):

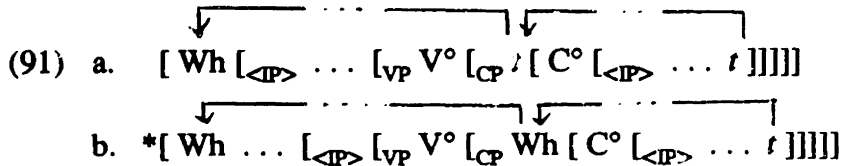
- (86) a. [_{CP} C° [_{TP} T° [_{IP} I° [_{VP} V°]]]]
 b. [_{CP} C° [_{IP} I° [_{TP} T° [_{VP} V°]]]]

The choice of either relative ordering of TP and IP has no effect on bounding theory. At this point, we might wonder how this additional functional projection bears on bounding theory. The question becomes all the more serious in light of Chomsky's (1989) proposal in which there is an AGR_{OP} serving as a complement to TP, and taking a VP complement, as in (87) (for convenience, we henceforth use the label AGRP for AGR_{OP}):



The movement from [SPEC, AGR] to [SPEC, CP] now crosses only one bounding barrier, namely, the IP/TP, the correct result.

Since extraction from under the VP is possible, long-distance extraction would be unproblematic. Consider the schematic structures in (91):



If extraction to an embedded [SPEC, CP] is possible as in (91a), the further movement from there to the matrix clause would cross only one bounding barrier, namely, the matrix IP delimiting the bounding category IP/TP. On the other hand, if the embedded clause is an island (i.e. [SPEC, CP] is occupied) as in (91b), then extraction out of the clause would cross two bounding barriers, namely, the two angle-bracketed IPs.

In sum, we can say that the conception of bounding as I suggest here with two bounding parameters and subsumption of bounding categories fits very well in syntactic theories that assume a proliferation of functional projections as suggested in works by Pollock (1989) and Chomsky (1989).

2.4.3. Some Problems with Gerunds

Bounding theory viewed from the perspective according to which the categorial identity of maximal projections is irrelevant to bounding, but their boundedness is dependent on the values of bounding parameters, seems to solve the problem of extraction from gerunds. The theory of subadjacency as suggested in Chomsky (1986b) also gives the same results in terms of L-marking (cf. section 2.6 for a brief mention of the difference between the two approaches).

As Battistella (1983) points out, the sentence in (92) poses a problem for subjacency if S (=IP) is always bounding:

(92) [_{S'} Who [did [_S you see [_S me talking to *t*]]]]

The movement in (92) should constitute a subjacency violation since it crosses two bounding barriers in one step. However, in the theory of bounding according to which the bounding effect can be voided by the bounding parameters, the boundedness of the lower IP in (92) can be annulled in a language like English by lexical selection (by the verb *see*); therefore, the movement from *t* to the Spec of the matrix CP crosses only one bounding barrier, namely, the matrix (lexically unselected) IP, and thus does not violate subjacency. In fact, this is exactly the case of constructions involving an ECM verb like *believe*:



(93) [_{S'} Who did [_S you believe [_S John to have talked to *t*]]]?

There are some issues with regard to the structure of gerunds which bear on the extraction fact that we just saw, however. On the one hand, there must be at least two maximal projections intervening between the matrix verb and PRO, so that PRO would not be ungoverned (Chomsky (1981)). One possibility is that projections of gerunds in (93) are S's (=CPs) (cf. Williams (1975), Reuland (1983)):

(94) [_{S'} Who did [_S you enjoy [_{S'} [_S PRO talking to *t*]]]]?

As far as bounding theory is concerned, no problem would arise. The *wh*-phrase *who* can make a transition in the Spec of the embedded CP.

On the other hand, the contrast in (95) raises the possibility that gerunds lack a Spec position (cf. Stowell's (1982) suggestion that gerunds lack COMP, the only pre-IP position for both complementizers and *wh*-phrases in the earlier view of clause structure):

- (95) a. I remembered [_{CP} what [_{IP} PRO to do *t*]]

 b. *I remembered [what [PRO doing *t*]]


That gerunds might lack a COMP position (in current terms, a C position in this case) is corroborated by the fact that no complementizer may occur next to a V+ing form:

- (96) a. John enjoyed talking to Bill.
 b. *John enjoyed for/that talking to Bill.

However, extraction out of the projection of a gerund is possible:

- (97) What didn't you remember [[PRO doing *t*]]


If the lack of a Spec position means that the projection has only a one-bar level (cf. McDaniel's (1989) suggestion for German infinitival and subjunctive clauses), then the problem for bounding theory is that movement of the *wh*-phrase to the Spec of the matrix CP crosses two bounding barriers, namely, the two angle-bracketed IPs:

- (98) What didn't [_{IP} you remember [_C [_{IP} PRO doing *t*]]]


The lower IP is bounding because it is not a complement to a lexical category. If the lack of a Spec position means that the projection has a full XP-projection, but the Spec position is simply not there (in other words, the XP-node exhaustively dominates the X'-node), then the problem for bounding theory would be that the movement out of the embedded CP has no escape hatch on its way to the matrix CP:

- (99) [_{CP} What [didn't [_{IP} you remember [_{CP} [_C [_{IP} PRO doing *t*]]]]]]


Direct movement from *t* to the Spec of the matrix CP in one fell swoop crosses two bounding barriers, namely the two angle-bracketed IPs.

The problem is thus three-fold. First, the projection of gerunds must have two maximal projections between the matrix verb and PRO, with PRO perhaps sitting in the Spec of the lower maximal projection:

- (100) a. ... V° [_{XP} [_{YP} PRO V°+ing ...]]
 b. * ... V° [_{XP} wh [_{YP} PRO V°+ing ...]]
 c. Wh ... [_{XP} [_{YP} PRO V°+ing t ...]]
- ↓

Second, without further stipulation, the upper maximal projection has a Spec position. We have to explain why *wh*-movement to this position is impossible (cf. (95b) where CP and IP correspond to XP and YP in (100b) respectively). Third, how is *wh*-movement out of a gerund possible, if YP is not a complement to a lexical category (cf. the IP in (95b)), and XP lacks a Spec position?

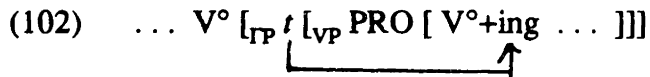
Reuland (1983) proposes a clausal structure for gerunds like the embedded clause in (94), schematically as in (101):

- (101) ... V° [_{S'} [_S NP* [_{INFL} -ing [_{VP} V° NP]]
 [N]

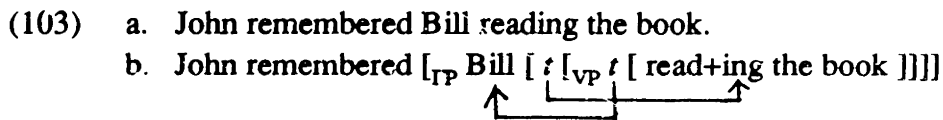
He claims that verbs like *remember* may take an indirect question complement which has a [+WH] COMP (in current terms, a [+WH] C°) at D-structure; hence, it cannot govern the INFL of its complement at neither D- or S-structure. The implicit assumption here is that if COMP is not [+WH], then government of the INFL of S' is allowed. This is reminiscent of the Minimality Condition. However, it is not clear why a C° with the feature [+WH] should count as a closer governor, but that with the [-WH] feature should not.

I would now like to argue for an alternative view of the structure of gerunds, in which the three problems mentioned above can be adequately addressed. Since our immediate

concern here is primarily bounding theory, I will not discuss the many issues, some of them quite thorny, in connection with gerunds, especially its categorial identity¹². To be neutral in this regard, I will call the categorial projection of gerunds as ΓP . In line with our assumptions that subjects originate in [SPEC, VP], the structure of a gerund would be something like (102):



PRO is not governed in (102), the problem of governed PRO is solved. To account for the possibility of having an overt subject as in the example in (103a), I suggest that it move from [SPEC, VP] to [SPEC, ΓP] as in (103b) to get Case from the matrix verb:



With the structure in (102) for gerunds, extraction out of gerunds would also be unproblematic. The head *-ing* of ΓP merges with V, the bounding category VP is thus

¹²As is well-known, gerunds seem to have the distribution of nominals:

- (i) a. John remembered having read this book.
 b. John remembered it.

However, it does not necessarily follow from the substitutability of a pronominal for a gerund that the gerund is of the same category as that of the pronominal. A sentential subject can be substituted by a pronominal like *it*, but there is to be reason to think that they are of the same category:

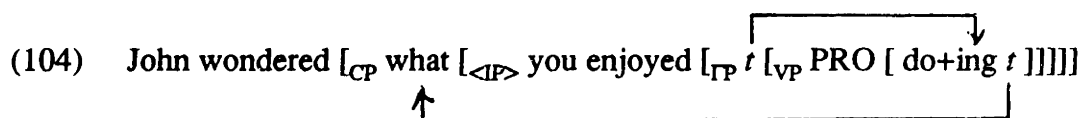
- (ii) a. That Mary left surprised John.
 b. It surprised John that Mary left.

Law (1990) claims that gerunds are NPs, headed by an N° *-ing*. If Abney (1987) is correct in that possessors appear in [SPEC, DP]:

- (iii) a. [DP John [D 's [NP book]]]
 'John's book'
 b. [DP who [D 's [NP book]]]
 'whose book'

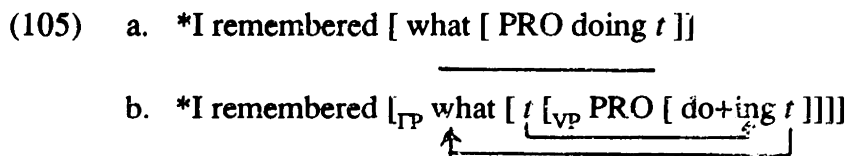
then the reason why a *wh*-phrase is impossible in (95b) would be reduced to the fact that *wh*-phrases do not remain in an A'-position other than [SPEC, CP].

subsumed under ΓP . Since *Acc-ing* gerunds are usually complements to a lexical category, they would then be turned into a non-bounding barrier in a language like English with the parameter [-lexical bounding]. Extraction out of a projection of a gerund thus need not make use of an escape hatch, since the movement crosses no bounding barrier. The second problem is thus solved. To see this, let us consider a derivation of an example with extraction out of gerunds. Since verb movement has some effect on defining bounding domains as discussed in section 2.4.2, we will consider here movement to a [SPEC, CP] in an embedded clause:



In (104), the head *-ing* and the verb *do* merge, the bounding category IP would be subsumed under ΓP , which would in turn be the delimit of the bounding category $\Gamma P/VP$ (cf. IP/VP in tensed clauses). Since it is a complement of the verb *enjoyed*, a lexical category, $\Gamma P/VP$ would not be a bounding barrier. (Recall that the parameter [-lexical bounding] in English turns a bounding category into a non-bounding barrier). Extraction of *what* out of the gerund in (104) needs not make use of a Spec position as an escape hatch. It crosses only one bounding barrier, namely the angle-bracketed IP. The grammaticality of the example is thus accounted for.

As for the third problem of why *wh*-movement to the Spec of $\bar{\Gamma}P$ is not allowed (cf. (95b)), I suggest that the chain resulting from such movement is ruled out by Chomsky's (1986a) Chain Condition (cf. section 1.5.5). Let us have a look again at the ungrammatical example (95b), repeated here in (105a):



As the grammaticality of the example in (103b) shows, it must be that the embedded

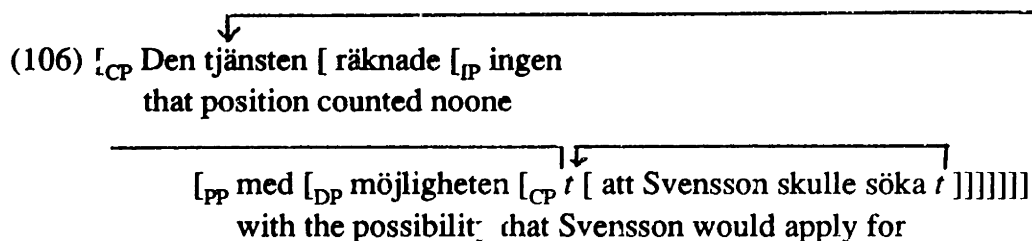
subject is Case-marked in [SPEC, Γ P]. Movement of the *wh*-phrase *what* from the object position of *do* to the [SPEC, Γ P] would create a chain that violates the Chain Condition. The chain (*what*, *t*) in (105b) has two Case-marked positions. One is the argument position of the verb *do*, and one is [SPEC, Γ P]. Alternatively, if we assume that traces of *wh*-phrases fall under Binding Condition (C), and thus must be A-free. But the trace in (105b) is A-bound, violating Condition (C) of the binding theory. The solution to the problem of *Wh*-movement in gerunds thus would not lead us to the assumption that projections of gerunds are exceptions with respect to X'-theory in that they lack a Spec position, a welcome result.

2.5. Subjacency in Scandinavian Languages

In this section, we will look at extraction facts in some Scandinavian languages to see whether the theory of bounding discussed in the previous section can cover these facts. It turns out that these languages are the of the type that has the parameters [-lexical bounding] [-functional bounding]. The theory of bounding with two parameters thus receives empirical support.

2.5.1. Island Violations in Scandinavian Languages

Scandinavian languages allow more extraction possibilities than those like English, as is well-known (Engdahl and Ejerhed (1982)). Engdahl (1982) points out that the example in (106) is possible in Swedish :



‘That position, noone counted on
the possibility that Svensson would apply for it.’

Movement of the object out of the Spec of the lowest CP in (106) crosses at least a CP

and an IP. Let us now see what other bounding category the movement might have crossed.

If the structure of a nominal projection in Swedish has the structure as in (107), where the definite article *en* is a D° head of a DP projection, and the head N° of its NP complement is incorporated into *-en*¹³:

$$(107) \left[{}_{\text{DP}} \text{N+en} \left[{}_{\text{NP}} t \right] \right]$$

then the bounding category NP would be subsumed under the DP, which would delimit the bounding category DP/NP. On the other hand, if the structure of a nominal projection in the language is as in (107b), where ϵ is the empty head D and the suffix *-en* is some sort of definite marker attached to the head N°:

$$(108) \left[{}_{\text{DP}} \epsilon \left[{}_{\text{NP}} \text{N}^\circ\text{-en} \right] \right]$$

then there would be two bounding categories: DP and NP.

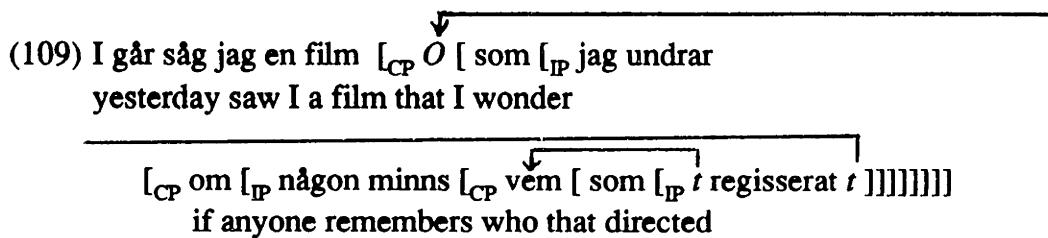
If Swedish is essentially like English in having the parameters [–lexical bounding] [+functional bounding], then the preposition *med* ‘with’ would render the bounding category DP/NP in (106) a non-bounding barrier. The PP in this structure is an argument of the matrix verb *raknade* ‘counted’, it is thus turned into a non-bounding barrier as well, by the parameter [–lexical bounding]. The movement of the object from the Spec of the embedded CP to the matrix clause would then cross only one bounding barrier, namely, the matrix IP.

¹³As is well-known, the head noun of a noun phrase must have the suffix *-en* if it is preceded by a definite article *den* ‘the’, but must not have it if it is preceded by an indefinite article like *en* ‘a’:

- (i) a. *den häst-en*
 the house
 b. *en häst*
 a house

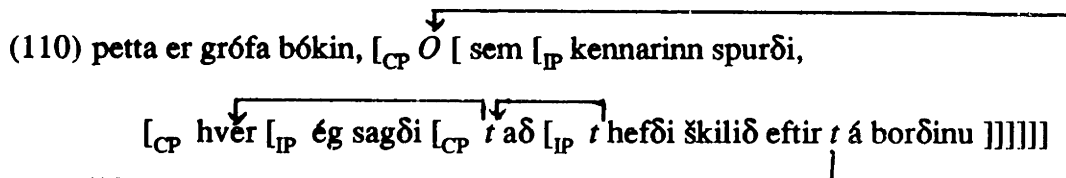
On the other hand, if the structure in (108) is correct for Swedish nominal projections, then the NP would delimit the bounding category NP. This is because the NP it is a complement to the functional category C, and is turned into a bounding barrier by the parameter [+functional bounding]. The movement from the embedded [SPE, CP] to the matrix clause would then cross two bounding barriers, namely the matrix IP and the NP in the embedded clause.

However, the grammaticality of the example in (109) clearly shows that Swedish is not like English with respect to the bounding parameters (adapted from Engdahl (1982)):



‘Yesterday, I saw a film that I wonder if anyone remembers who directed it.’

Movement of the empty operator *O* from the embedded clause crosses three IPs and two CPs, which would constitute a subjacency violation regardless whether IP or CP is bounding. Zaenen (1985) also points out one apparently problematic case in Icelandic in which assuming either S (=IP) or S' (=CP) as bounding would both lead to a subjacency violation:



‘This is the dirty book that the teacher asked
who I said had left behind on the desk.’

The apparent lack of bounding barriers in Scandinavian languages is in fact what we should expect in the theory of bounding with two bounding parameters as I suggested, if these languages set the bounding parameters as [–lexical bounding] [–functional

bounding]. That is, no maximal projection is bounding. It thus seems that the Scandinavian languages are the fourth type of languages in the class of possible languages partitioned by the two bounding parameters.

2.5.2. Extraction Out of Verb-Second Clauses

However, as Holmberg (1986) points out, extraction out of embedded verb-second clauses is impossible. This is quite surprising since extraction is relatively free in the examples we saw in the last section. I would like to show that the constraint on extraction out of these contexts must lie not in the theory of subjacency, but somewhere else. Unfortunately, it is not quite clear what the constraint is. Let us now have a look at some examples of this kind of constructions.

Some verbs in Swedish, mostly verbs of saying, may take a verb-second clausal complement (not counting the complementizer as the first constituent):

- (111) a. Hasse sa att han var inte rädd för ryska ubåtar.
 he said that he was not afraid of russian submarines
 'He said that he was not afraid of Russian submarines.'
 b. Det vet jag att Eva kommer alltid i tid.
 that know I that comes always on time
 'I know that Eva always comes on time.'

With the assumption that adverbials like *inte* 'not', *alltid* 'always' as adjuncts to VP, the finite verbs must have moved out of their projections in the examples above, since they appear to the left of the adverbials. Holmberg suggests that the structure of a verb-second embedded clause like the one in (111a) be something like that in (112a), not that in (112b) (cf. Travis (1984)):

- (112) a. $[_{S'} \text{ att } [_{S''} \text{ Eva } [_{S'} \text{ kommer } [_{S'} t \text{ } [_{I'} t \text{ alltid i tid }]]]]]]$
 b. $[_{S'} \text{ att } [_{S'} \text{ Eva } [_{I'} \text{ } [_{IV'} \text{ kommer }] \text{ alltid } [_{VP} t \text{ i tid }]]]]]]$

He argues that the structure in (112a) must be allowed independently in any event, since an embedded verb-second clause may have a non-subject as the first constituent:

- (113) a. Jag vet att Eva kan man lita på.
 I know that can man rely on
 'I know that one can rely on Eva.'
- b. Vi har bestämt att i morgon stiger vi upp tidigt.
 we have decided that tomorrow get we up early
 'We have decided that we get up early tomorrow.'

If we assume that subjects are in [SPEC, IP] at S-structure in Swedish, then structures for the embedded clauses in the sentences in (113) must be those in (114):

- (114) a. ... [_{S'} att [_{S''} Eva [_{S'} kan [_S man [_{I'}t [_{VP} lita på t]]]]]
- b. ... [_{S'} att [_{S''} i morgon [_{S'} stiger [_S vi [t upp tidigt]]]]]]

Extraction out of an embedded verb-second clause is impossible, however, even if the first constituent in the clause is the subject (Holmberg (1986)):

- (115) a. Ryska ubåtar sa Hasse [att han är faktiskt rädd för t]
 Russian submarines said that he actually is afraid of
 'Hasse said that he actually is afraid of Russian submarines.'
- b. *Ryska ubåtar sa Hasse [att han är faktiskt rädd för t]

The same contrast obtains in (116):

- (116) a. När sa du [att Eva alltid kommer t]
 when said you that always comes
 'When did you say that Eva always comes?'
- b. *När sa du [att Eva kommer alltid t]

It goes without saying that extraction out of a verb-second with a non-subject as the first constituent in the clause is also impossible:

- (117) a. Vilken fest sa hon [att vi inte skulle köpa roliga hattar till t]
 which party said she that we not should buy funny hats for
 'Which party did she say that we should not buy funny hats for?'

- b. *Vilken fest sa hon [att vi skulle inte köpa roliga hattar till t]
- c. *Vilken fest sa hon [att roliga hattar skulle vi inte köpa t till t]
- d. *Vilken fest sa hon [att antagligen behövde vi inte köpa roliga hattar till t]
 which party said she that probably need we not buy funny hats for
 'Which party did she say that we probably need not buy funny hats for?'

It is not clear what category S'' is in (114), and how it fits into current assumptions about clause structure. If we take it as a CP (Vikner (1990)), then an embedded verb-second complement would have a double-CP structure. For generality, let us take it to be of some category XP:

- (118) a. [CP att [XP Eva [kommer [IP t [t [VP alltid [VP t i tid]]]]]]]
- b. [CP att [XP Eva [kan [IP man [t [VP t lita på t]]]]]]]

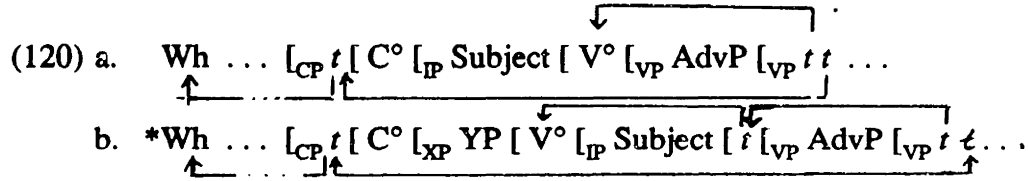
For the sake of argument, let us suppose that XP is always a bounding barrier for some reason. Since CP and IP are not bounding in Scandinavian languages as we saw, movement of the *wh*-phrase from the embedded clause would cross at most only one bounding barrier, namely the XP, which we assume for the sake of argument is a bounding barrier. Even in this hypothetical case, subjacency is still not violated.

That subjacency is not involved in cases of extraction out of embedded verb-second clauses is further evidenced in the grammatical contrast in the Icelandic examples in (119) (Viker (1990)):

- (119) Havða mynd sagði hún
 which film said she
- a. ?*að i skólanum hefðu börnin thví miður séð ?
 that in the school had the children unfortunately seen
- b. *að börnin hefðu thví miður séð ?

- c. *að hefðu börnin því miður séð ?
 d. að börnin hefðu því miður séð ?
 'Which film did she say that the children had unfortunately seen at school?'

Consider the schematic structure for the above examples:



Even if XP is bounding, movement out of the embedded IP in (120b) can use [SPEC, CP] as an escape hatch.

Holmberg (1986) conjectures that the impossibility of extracting an element out of an embedded verb-second clause might be accounted for by some version of Huang's (1982) Condition on Extraction Domain if we assume embedded verb-second clauses are not complements to the matrix verbs:

(121) Condition on Extraction Domain (CED)

A phrase *A* may be extracted out of a domain *B* only if
B is properly governed.

However, as he also points out, evidence for such an assumption does not seem to be very strong.

In sum, although there are some problems regarding extraction out of embedded verb-second clauses, it seems rather clear that subjacency is not relevant in Scandinavian languages (Maling and Zaenen (1982)). This result is consistent with the theory of bounding with two parameters in that the values for the parameters in these languages are [-lexical bounding] [-functional bounding].

2.6. Conclusions

To conclude our discussion, let us summarize the proposal suggested here and briefly consider its relationship with theory of government. Bounding theory is suggested to comprise a subjacency condition, and two parameters to effect barriers or non-barriers to bounding. A maximal projection can be rendered as a bounding barrier or not, depending on the complementation relation it has with the selecting head, and the values of the parameters. In addition, a potential bounding barrier, a bounding category, can be subsumed under another by virtue of head-movement, or by being dominated by a projection of the same category. It was argued that successive-cyclic movement must be constrained by structure-preservation, in order to account for the more limited possibilities of extraction of DPs, in comparison to that of PPs. It was shown that independent facts about extraction out of gerunds can be also accounted for straightforwardly within the confines of these assumptions.

One strong empirical prediction that this theory of bounding entails is that the class of possible languages with respect to the bounding variations is partitioned into exactly four. All four types of languages are attested. The representatives of the four types are English with [–lexical bounding] [+functional bounding], Italian [+lexical bounding] [–functional bounding], Welsh [+lexical bounding] [+functional bounding], and Scandinavian languages [–lexical bounding] and [–functional bounding].

The way the parameters annul the bounding effect is certainly reminiscent of Chomsky's (1986b) L-marking, which renders a category a non-BC, with consequences for theory of government. However, there is two major differences between L-marking and the way parameters render projections non-bounding. First, all categories may render a category a non-barrier for movement, as opposed to L-marking by lexical categories only. Thus, from an empirical point of view, L-marking does not seem to cover the range of bounding variations. L-marking is either in effect or not, but there are four types of languages with respect to subjacency. Second, it is possible to use

successive-cyclic adjunction for PPs to get around the problem of subjacency, but barriers to government cannot be, as we will see in section 4.2.4. This in turn means that barriers for movement and government must be distinct. However, the idea of domain-subsumption seems to be useful in defining government barriers as well. It might be that there is some general notion of domain for both government and movement, and the theory of government would turn this domain into a blocking category (and subsequently a barrier) relevant to government, as suggested in Chomsky (1986b), and theory of bounding would turn it into a bounding barrier, as I suggested here. One other usefulness of domain-subsumption is that we need no special assumption about VP and IP with respect to barrierhood. Since V and INFL merge, not only do we need no special assumption to the effect that VP is not a BC, nor do we need to stipulate that IP is defective. IP would delimit the domain IP/VP, and thus at most a BC. Extraction of the object from under the V' to the local [SPEC, CP] thus crosses no barrier.

Appendix: A Note on Preposition-stranding

Homstein and Weinberg (1981) suggest the three conditions in (i)-(iii) as constraints on preposition-stranding (nominal projections are assumed to be NPs in their analysis):

- (i) Universal filter against oblique traces:
*_[NP e]
oblique
- (ii) Reanalysis:
V → V* (where V c-commands all elements in V*)
- (iii) Case-marking rules (cf. Chomsky (1980))
 - a. NP is marked [+nominative] if it is governed by tensed, i.e. if it is marked the subject of a tensed clause.
 - b. NP is marked [+objective] if it is governed by V.
 - c. NP is marked [+oblique] if it is governed by P.
 - d. *Wh*-NPs are assigned the case of the closest trace which bears their index and which is in a possible Case position. Both the *wh*-element and the relevant trace are marked with Case.

With the stipulation that Reanalysis optionally applies in the base, and that Case-marking crucially follows Reanalysis. Thus, the VP in the example in (iva) can have representations like those in (ivb) and (ivc):

- (iv) a. [_S John [_{VP} [_V talked] [_{PP} to Harry] [_{PP} about Fred]]]
- b. [_S John [_{VP} [_V talked to Harry about Fred]]]
- c. [_S John [_{VP} [_V talked to Harry about] Fred]]

Reanalysis effectively yields complex verbs like *talked to Harry about Fred* and *talked to Harry about*. The NP *Fred* can be extracted, stranding the preposition *about* only if Reanalysis applies as in (v):

(v) Who did John [_{VP} [_V talked to Harry about] *t*]

Putting aside the many issues that arise in connection with complex verbs (e.g. how can inflectional morphology be attached on any subpart of a verb, etc.), there are some empirical problems with this approach. Consider the example in (vi), which has the status of a subjacency violation:

(vi) ?What did John wonder [_{CP} who [_{IP} Mary talked to *t* about *t*]]

In order to strand *to*, the example must have the structure in (vii):

(vii) ?What did John wonder [_{CP} who [_{IP} Mary [_V talked to] *t* [_{PP} about *t*]]]

But the trace of *what* would violate the filter in (i). Alternatively, the example may have the structure in (viii):

(viii) ?What did John wonder [_{CP} who [_{IP} Mary [_V talked to *t* about] *t*]]

But this is possible only if Reanalysis applies after *Wh*-movement, not in the base. Moreover, it is not clear if a complex verb should be allowed to contain a trace.

Another problem is the pseudopassives. In order to allow (ix), but disallow (x):

(ix) John was taken advantage of.

(x) *John was talked to Harry about.

Hornstein and Weinberg suggest that idioms like *take advantage of* are possible semantic words, but those like *talk to Harry about* are not. To the extent that *talked to Harry about* in (v) can be reanalyzed as a complex verb, it is not clear why the same is not true

in (x). Nor is it obvious how parametric variations with respect to preposition-stranding are to be accounted for in this approach short of stipulating that languages might differ in having or not having a Reanalysis rule.

Kayne (1981) suggests that preposition-stranding is possible if prepositions govern in some sense the same way as verbs. He argues that the difference between English and French is that in English both verbs and prepositions assign structural Case, but in French prepositions assign oblique Case. The idea seems to be extendable to Dutch, a language in which postpositions may be stranded, prepositions may not:

- (xi) a. Hij komt achter het huis vandaan.
he comes behind the house from
'He is coming from behind the house.'
- b. Waar komt hij vandaan?
where comes he from
'Where is he coming from?'
- (xii) a. Hij woont in dat huis.
he lives in that house
'He lives in that house.'
- b. *Welk huis woont hij in?
which house lives he in
'Which house does he live in?'

If we assume that "govern in the same way" in Dutch means same direction of government, then the possibility of stranding postpositions would be due to the assumption that Dutch verbs govern to the left. However, the same reasoning does not work for German. Both prepositions and postpositions may not be stranded:

- (xiii) a. Hans arbeitet mit einem Hammer.
works with a hammer
'Hans is working with a hammer.'
- b. *Was arbeitet Hans mit?
what works with
'What is Hans working with?'

- (xiv) a. Hans wohnt dem park gegenüber.
lives the park across
'Hans lives across the park.'
- b. *Welchem Park wohnt Hans gegenüber?
which park lives across
'Which park does Hans live across?'

Chapter 3

Abstract Verb Movement and Complementizer Agreement

3.1. Introduction

In this chapter, we will be looking at the question of how complementizer agreement is to be accounted for. I show that complementizer agreement is independent of *Wh*-movement, and suggest that a theory of abstract verb movement to C effected by the Principle of Full Interpretation affords us an explanatory account of complementizer agreement without complicating the grammar. If it is correct that adjuncts never bear a Spec-head relation with a head to which the verb moves, then it follows that there could never be complementizer agreement with agreement. The analysis that I suggest crucially hinges on some syntactic features, which I argue could explain the distribution of different types of DPs, quite independently of complementizer agreement.

The chapter is organized as follows. In section 3.2, we will first look at complementizer agreement in West Flemish in constructions involving movement and those without movement. In section 3.3, we will discuss complementizer agreement in French, the well-known *que/qui* alternation, and show that it can be given essentially the same account as that for West Flemish. We justify some additional syntactic features that are crucially at work for the expletive replacement analysis in section 3.4. Some apparent cases of Spec-head agreement in CP are shown in section 3.5 either to have an alternative in which the complementizer is implicated, or not to be conclusive with respect to complementizer agreement, the section ends with a discussion of the lack of agreement with adjuncts is discussed. Some conclusions are in section 3.6.

3.2. Complementizer Agreement in West Flemish

The phenomenon of apparent agreement between the complementizer and the noun phrase in the Spec of its IP-complement in West Flemish (henceforth complementizer agreement), as shown in the work of Haegeman (1983), Bennis and Haegeman (1984), seems to suggest some new direction for linguistic theory. This is because the relationship between these two elements in a configuration like that in (1) is clearly not a Spec-head relation as schematized in (2), a relation that is assumed to license agreement (Chomsky (1986b)):

(1) ... [_{CP} [_C C° [_{IP} DP [_{I'} I° ...

(2) ... [_{IP} DP [_{I'} I° ...

For ease of exposition, we will henceforth refer to the DP in (1) as the **local embedded subject with respect to the complementizer C** under discussion (i.e. the noun phrase in the Spec of the IP that is the complement to C).

Whereas Spec-head agreement as in the case of subject-verb agreement is fairly common cross-linguistically, agreement between C and the local embedded subject as in the configuration in (1) is considerably rarer. So a question that naturally arises is whether theory of agreement should be extended to include the relationship between complementizers and the local embedded subjects¹. In this section, I show how complementizer agreement in West Flemish can be accounted for without such an extension.

West Flemish is a verb-second language, on a par with German and Dutch, in that it has the finite verb in the second position in main clauses, and in a clause-final position in

¹Let us note here that complementizer agreement of the sort in (1) cannot be obtained by predication for two reasons. Structurally, there is simply no mutual c-command relation holding between the complementizer and the local embedded subject. Semantically, complementizers do not seem to be suitable as subjects of predication.

an embedded clause² (Haegeman (forthcoming)):

- (3) a. Jan heet den vent gezien.
 has the man seen
 ‘Jan saw the man.’
 b. *Gisteren Jan heet den vent gezien.
 yesterday
 ‘Yesterday, Jan saw the man.’
 c. Gisteren heet Jan den vent gezien.
- (4) a. Marie peinst da Jan den vent gezien heet.
 thinks the man seen has
 ‘Marie thinks that Jan saw the man.’
 b. *Marie peinst da Jan heet den vent gezien.

The grammatical patterns of the examples in (3) and (4) appear to suggest that finite verbs move to C when the C position is empty, just like in German and Dutch (Koster (1975), den Besten (1977), Thiersch (1978) and others). The structure for (3a) and (4b) would then be something like (5a) and (5b) respectively:

- (5) a. [_{CP} Jan [_C heet [_{IP} t [_{VP} den vent gezien t] t]]]
 b. Marie peinst [_{CP} [_C da [_{IP} Jan [_{VP} den vent gezien t] heet+I]]]

In (5a), in absence of an overt complementizer, the finite verb *heet* ‘has’ moves to the C position. Conversely, in (5b), since *da* appears in the embedded C position, the verb *heet* ‘has’ cannot move there.

Suppose non-finite verbs stay in their base-positions, and that INFL must be attached to a finite verb at S-structure for morphological reason (Lasnik (1981)), then the position where the finite verb *heet* ‘has’ occurs in the embedded clause as in (3a) has two possible

²The orthography for the verb *heen* ‘have’ would be given as in the original sources. It is sometimes written as *heen*, and sometimes *een*.

analyses. Either INFL has lowered to V, as in (6), or V has raised to INFL, as in (7):³

- (6) a. . . . [IP Jan t [_{VP} den vent gezien heet+I]]
- ↑
- b. . . . [IP Jan [_{VP} den vent gezien heet+I] t]
- ↑
- (7) . . . [CP da [IP Jan [_{VP} den vent gezien t] heet+I]]

Whereas the structure in (6a) with INFL to the left of its VP-complement has been argued for in Zwart (1990), that in (7) with INFL to the right of the VP is suggested in Vikner and Schwartz (1991). There does not seem to be empirical evidence that distinguishes the structure in (6b) and that in (7), however. On theoretical grounds, there is reason to assume verb-raising to INFL at S-structure, since at LF, in order to eliminate the illegitimate chain created by INFL-lowering (because of the ECP), the V+I complex must raise back to INFL, yielding a representation like (7). Given the Economy considerations, a derivation where the verb raises to INFL at S-structure is to be chosen, since it would alleviate LF-raising of V+I. Thus, we will assume S-structure verb-raising to INFL, at least for languages like German, Dutch and West Flemish in which complementizers and finite verbs are in complementary distribution. We henceforth refer to the property of syntactic verb-raising to C in the absence of the complementizer as the verb-second property.

West Flemish complementizers vary morphologically in accordance with the em-

³There is some evidence suggesting that clausal complements in German and Dutch are extraposed from the base-generated position inside the VP (Evers (1975), Koster (1975) and Reuland (1984) among others):

- (i) [CP weil [IP wir t_i glaubten [CP dass Peter die Geschichte erzählte]]]
 because we believed that the story told
 'because we believed that Peter told the story.'

If *weil* 'because' is in the C position as the structure in (i) indicates, then the verb *glaubten* 'believed' cannot possibly be also in the same position. Since finite verbs in embedded clauses are clause-final in languages like German and Dutch, and along with the assumption that complements occur uniformly on one side of the selecting head (to the left in this case), then the clausal complement in (i) must have been extraposed to the right of the selecting verb *glaubten* 'believed'. (For an account for why clausal extraposition is obligatory, cf. Reuland (1984)). In the same manner, the clausal complement in (5b) has also been extraposed. Since it does not directly concern us here, the trace of the extraposed clause is not represented.

bedded subject (henceforth referred to as complementizer agreement). The full paradigm of agreement is given in (8) (Bennis and Haegeman (1983), Haegeman (1990)):

- | | | | |
|-----|------------------------------------|------|------------------------------|
| (8) | a. K weten dan-k (ik) | goan | weggoan |
| | I know that I | go | leave |
| | 'I know that I am going to leave.' | | |
| | b. K weten da-j (gie) | goat | weggoan (that-you) |
| | c. K weten da-se (ij) | goat | weggoan (that-she) |
| | d. K weten da-tje (zie) | goat | weggoan (that-he) |
| | e. K weten da-t (tet) | goat | weggoan (that-it) |
| | f. K weten da-me (wunder) | goan | weggoan (that-we) |
| | g. K weten da-j (gunder) | goat | weggoan (that-you) |
| | h. K weten dan-ze (zunder) | goan | weggoan (that-they) |
| | i. K weten da Jan | goat | weggoan(that Jan) |
| | j. K weten dan Jan en Marie | goan | weggoan (that Jan and Marie) |

where the presence of the complementizer is obligatory. Before we leave this descriptive section and proceed to consider some analyses of the data presented above, let us note in the outset a couple of analyses that are implausible. The possibility of having an overt pronoun in embedded subject positions, as the examples in (8a)-(8h) show, appear to preclude any analysis according to which the forms of the complementizers are the results of cliticization of the pronouns from the embedded subject positions. Indeed, Bennis and Haegeman (1983) point out that it would be difficult to relate cliticization to the obligatory agreement between the complementizer and non-pronominal subjects in cases like (8i) and (8j), and to the possibility of having an overt pronoun in the embedded subject position in cases like (8a)-(8h). In addition, since there is no *Wh*-movement in the sentences in (8) (most clearly in the sentences in (8i) and (8j) where there is no gap), we can conclude that complementizer agreement is entirely independent of *Wh*-movement. We thus have grounds to discount any analysis of complementizer agreement that crucially relies on Spec-head agreement, which comes about as a result of movement of some XP to the Spec of CP (cf. Déprez (1990), and Rizzi's (1990a) suggestion of agreement in COMP, and the discussion in sections 3.5 and 5.8).

With this much background, let us now discuss in turn two types of analysis of complementizer agreement, which differ with respect to whether the agreement is related to the verb movement or not.

3.2.1. Constructions with no *Wh*-movement

We consider here two analyses of complementizer agreement in West Flemish which do not hinge on *Wh*-movement or X° -movement to C. One is that the agreement is licensed by some sort of co-indexing between C and INFL, and the other is that the agreement is obtained by selectional restriction imposed on INFL by C.

3.2.1.1. Co-Indexing of C and INFL

An account that does not appeal to XP-movement or X° -movement to C is suggested in Haegeman (1983) (cf. also Bennis and Haegeman (1984)), according to which there is simply some sort of co-indexing between C and the local embedded subject, along the lines of Bennis's (1982) proposal for COMP-indexing, which co-superscripts these two elements:

$$(9) \quad \dots [{}_{C'} C^i [{}_{IP} DP^i [{}_{I'} I \dots$$

Under this view, it is the co-indexation that licenses agreement between C and the local embedded subject. However, the account is actually not as simple as it might look at first glance. In fact, there are at least three issues that we must address: (i) is there any constraint on co-indexation for agreement? We will show that there must be, which in turn leads to the other two issues: (ii) how should the constraint be stated? and (iii) what is its relationship with the rest of the grammar. Of course, we will also ask whether the constraint itself could be made to follow from the general principles of the grammar.

Let us first consider the issue of the constraint on co-indexation. Consider the familiar subject-verb agreement, which we assume as an instance of Spec-head agreement. The subject DP is in [SPEC, IP], agreeing with INFL, which bears an X' -theoretic Spec-head

relation with the subject (indices here indicate the same value of some ϕ -features, in particular, the Number feature):

(10) $[_{IP} \text{John}_i [_I \text{is}_i [_{VP} \text{running}]]]$

In other words, Spec-head agreement is licensed by the Spec-head relation. Consider now the ungrammaticality of the sentence in (11):

(11) $*[_{IP} \text{John}^i [_I \text{are}^j \text{thinking} [_{CP} \text{that} [_{IP} \text{they}^j [_I \text{is}^i \text{running}]]]]]$

In principle, if we have no constraint on co-indexation for agreement, we could have a non-local complementizer agreement of the sort in (12):

(12) $[_{IP} \text{DP}^i [_I \text{I}^j \dots [_{IP} \text{DP}^j [_I \text{I}^i]]]]$

which would then give us the result that the example in (11) should be grammatical. To rule it out, we must disallow co-indexation of the sort in (12). With the assumption that agreement can be licensed by Spec-head agreement⁴, the ungrammaticality of (13) can then be accounted for by the fact that there is simply no Spec-head relation licensing Spec-head agreement between *John* and *is*. In fact, there is no X' -theoretic relation between them at all (nor is there a relation between *they* and *are*). Likewise, we can also rule out agreement between the DP of the lower clause and the non-adjacent clause whose head is indexed j in (12).

We can carry the same argument in the discussion of (10)-(11) over to complementizer agreement. If the co-indexation of the sort in (12) is disallowed, then there seems to be no reason why that in (13) should be permitted:

(13) $\dots [_C \text{C}^j [_{IP} \text{DP} [_I \text{I} \dots [_{IP} \text{DP}^j [_I \text{I} \dots$

⁴As we will in section 5.8, we must enrich agreement to cover cases of relative clauses. But the enrichment does not cover complementizer agreement.

We can imagine how a language with agreement licensed by the rule in (13) might look like. It is just like West Flemish, but the form of the complementizer varies not with the local embedded subject, but with one that is further away. Compare a sentence in the hypothetical language in (14a) with that in West Flemish in (14b):

- (14) a. K weten dan Jan zegt da Pol en Marie goan weggoan.
'I know that Jan says that Pol and Marie are going to leave.'
- b. K weten da Jan zegt dan Pol en Marie goan weggoan.
'I know that Jan says that Pol and Marie are going to leave.'

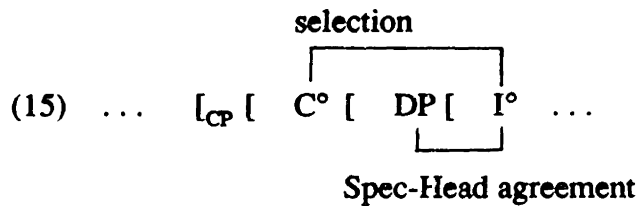
To the best of my knowledge, a language with non-local complementizer agreement of the sort illustrated in (14a) is unattested. If this is correct, then we must have some constraint from which it follows that only the co-indexing in (9) is permitted, but that in (12) is not.

There does not seem to be natural way to state the constraint, short of restating the locality condition as in (9). If we are to integrate agreement by co-indexation to the general theory of agreement, then there are further ramifications. We must first give a formal status to the relationship between C and the local embedded subject, perhaps extend X'-theory to include that relationship on a par with the three familiar X'-theoretic relations (Spec-head, Head-complement, Adjunct-head), then extend theory of agreement to include the fourth formal relation as one of the two permissible ways of licensing agreement.

The two auxiliary assumptions just mentioned do not appear to be of use elsewhere in the grammar, hence seem to lack independent justification, however. With these issues in mind, let us now consider an alternative which crucially does not make these two assumptions. In addition, we will consider a possibility in which the non-existence of non-local complementizer agreement of the sort illustrated in (12) is a necessary consequence of the grammar.

3.2.1.2. Selection of INFL by C

In a configuration like (9), the embedded subject and INFL agree by Spec-head agreement with respect to the set of ϕ -features (relevant here are the Number, Person, Gender, and Pronominal features). Suppose now that C selects INFL with the same set of ϕ -features, then the agreement between C and the embedded subject can be derived (Rizzi (1990b), Haegeman (forthcoming)):



C then derivatively agrees with the local embedded subject, which has the same ϕ -features as INFL by Spec-head agreement.

This view is quite plausible given the DP-analysis of noun phrases (Barwise and Cooper (1981), Brame (1981, 1982), Szabolcsi (1981, 1983), Fukui and Speas (1986), Abney (1987) and others), according to which determiners are heads of noun phrase, taking an NP as its complement, a Head-complement relation:



There is clearly agreement in ϕ -features between determiners and their NP-complements (henceforth, **determiner agreement**), which manifests morphologically in languages that have different phonetic specifications of the determiners in accordance with the ϕ -features:

- (17) a. [_{DP} [_{D'} These/*This books]]
 b. [_{DP} [_{D'} Those/*That books]]

- (18) a. [_{DP} [_D Der Mann]] (German)
 the.MASC.NOM.SG man.MASC.SG
 ‘The man’
- b. [_{DP} [_D Die Männer]]
 the.NOM.PL man.PL
 ‘The men’
- c. [_{DP} [_D Das Kind]]
 the.NEUT.NOM.SG child.NEUT.SG
 ‘The child’
- d. [_{DP} [_D Die Kinder]]
 the.NOM.PL child.PL
 ‘The children’
- (19) a. [_{DP} [_D Une fille]] (French)
 a.FEM.SG girl.FEM.SG
 ‘A girl’
- b. [_{DP} [_D Des filles]]
 some.PL girl.PL
 ‘Some girls’
- (20) a. [_{DP} [_D Die boeken]] (West Flemish)
 those.PL book.PL
 ‘Those books’
- b. [_{DP} [_D Da boek]]
 that.SG book.SG
 ‘That book’

The relation between D and NP in (16) is exactly like that between C and IP in (9). If there is ϕ -feature selection of NP by D, then there is no reason why there should be no selection between C and IP.

However, there seem to be two reasons why we should not adopt the selection analysis of complementizer agreement. One of them is discussed here, and the other related to theory of proper government is dealt with in Chapter 4.4. If selection involves inherent features with semantic correlates, and only these (cf. section 1.5.4), then INFL cannot be selected. INFL apparently does not have any inherent features other than Tense, which does have some semantic correlate and can be selected. If this is correct,

then an analysis appealing to ϕ -feature selection imposed on INFL by C analogous to determiner agreement is not available for complementizer agreement.

Although the issues that arise in the two analyses we just considered are not insurmountable, there appear to be no strong motivation for making additional assumptions in order to make the analyses to work. As we will see in section 4.xx when we consider facts about long-distance extraction, the non-movement analyses of complementizer agreement do not seem to fit squarely into these facts. With this in mind, let us proceed to the next section where we consider two analyses that need neither a relation other than Spec-head relation to license agreement, nor an appeal to ϕ -feature selection imposed on INFL by C, but exploit the possibility of abstract movement to C of some sort.

The two analyses that we will be discussing next, though both assuming some kind of I-to-C movement, differ with respect to whether the whole V+I complex, as opposed to only INFL, moves to C, and also with respect to the level at which I-to-C movement takes place. It turns out that these differences imply quite different consequences. Notice that there is a separate question why V+I or INFL has to move to C at all, an issue that is beyond the scope of this work (cf. Haider and Prinzhorn (1986) and Rizzi (1990b) for some discussion).

3.2.1.3. Stranded V Analysis

As the sentence in (21) shows, repeated from (3b), the embedded finite verb shows agreement with the embedded subject:

- (21) Marie peinst da Jan den vent gezien heet/*heen.
 thinks the man seen have.3SG/have.3PL
 'Marie thinks that Jan saw the man.'

If the structure of the embedded clause of the sentence in (21) is as in (22) (indices here are convenient notations to indicate the particular choices of ϕ -features):

(22) Marie peinst [_{CP} [_C da [_{IP} Jan [_{VP} den vent gezien t_k] heet_{k+I}]]]

then the presence of both the complementizer *da* ‘that’ and the finite verb *heet* ‘has’ indicates that the finite verb has moved to INFL, but not to C. In order to account for the morphological alternation of the complementizer, we might claim that INFL has moved to C from which the complementizer picks up the ϕ -features, schematically as in (23). The structure of (22) after INFL has moved to C is as in (24):

(23) ... V [_{CP} C+I_j [_{IP} NP_i [V+[t_j]]_{I₁}]] ...

(24) ... [_{CP} [_C da+I_j [_{IP} Jan_i [_{VP} den vent gezien t_k] heet_{k+t_j}]]]

That is, the finite verb is stranded in the adjoined position, and the original INFL moves to the C position. The apparent agreement between C and the embedded subject can then be obtained as follows. By Spec-head agreement, INFL agrees with the embedded subject, thus $i=j$. V and C get the actual surface forms by spell-out rules as we discuss in section 1.7:

(25) a. heen+I → *heet*
have+[3SG.PRES.INDIC]

b. heen+I → *heen*
have+[3PL.PRES.INDIC]

(26) a. C+I → *da*
[3SG,-PRON]

b. C+I → *dan-ze*
[3PL,+PRON]

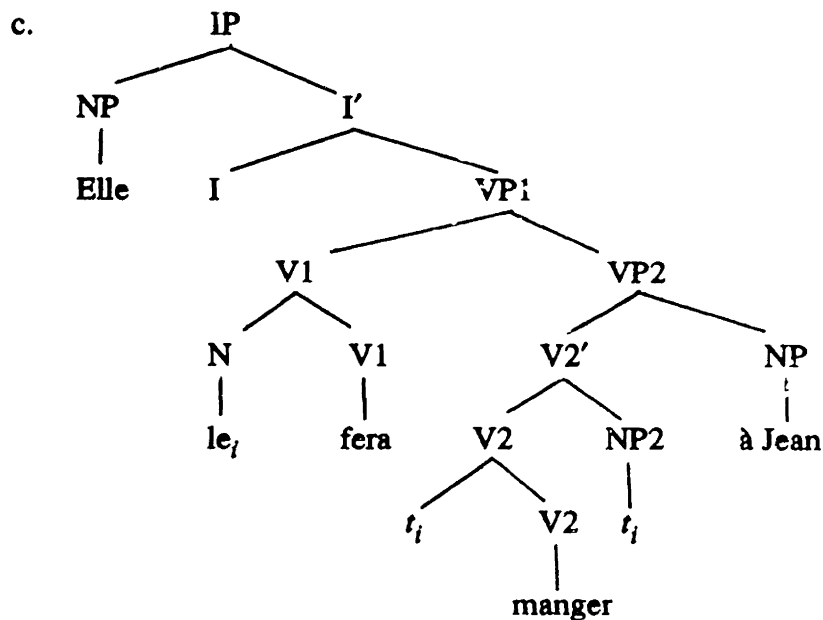
It is important to bear in mind that in this account of spell-out rules, just as there is no X'-theoretic relation licensing the agreement between the finite verb and INFL, there is nor X'-theoretic relation licensing agreement between C and the embedded subject.

The rule in (25a), for example, says that when the verb *heen* ‘have’ appears next to (i.e. a sister to) an INFL with the features [3SG.PRES.INDIC], then the complex *heen*+I is spelled out phonetically as *heet*⁵. Similarly, the rule in (26a) says that the complex consisting of an abstract complementizer C and an INFL with features [3SG.+PRON] is spelled out phonetically as *da*. With this understanding of how the spell-out rules work, verbs and complementizers that undergo these rules do not have the relevant features inherently. They are simply parts of the structural descriptions from which the surface phonetic forms obtain.

Although the analysis just sketched gives the correct result for complementizer agreement, there are at least two issues that we have to deal with. The first one is whether such I-to-C-movement with a stranded V is allowed. On the one hand, if the Lexical Integrity Hypothesis (LIH) disallowing movement of any subpart of an X° (Chomsky (1970), Bresnan (1972)) is correct, then a derivation like (23) is impossible. On the other hand, Li (1990), in the discussion of clitic-climbing in Romance languages, claims that an adjoining X° may move on, which would violate the LIH. Li argues that if a sentence like (27b), which differs from that in (27a) in that instead of a full noun phrase as the object of the verb *manger* ‘eat’, we have a clitic *le* ‘it’, which has moved as an N° from the embedded clause, first adjoining to V2, then to the matrix verb *fera* ‘make’ (and finally the matrix verbal complex *le fera* moves to the matrix INFL, not represented here. The numbers on the categorial labels are for ease of reference):

- (27) a. Elle fera manger ce gateau a Jean
 ‘She will make Jean eat that cake’
- b. Elle le fera manger a Jean
 ‘She will make Jean eat it.’

⁵To handle cases like (24) where the finite verb is a sister to the trace of INFL which has moved to C, we can appeal to the assumption that the set of ϕ -features is a property of chain. That is, the fact the V+I complex *heen*+I is spelled out as *heet* is because the verb agrees with the chain that has the features [3SG], of which the trace is a member. Cf. section 1.6).



A derivation like (23) is thus very much on a par with that in (27c), with the difference in that in (23) it is the adjoined-to element, i.e. INFL, not the element that is adjoining, i.e. V, that undergoes further movement to C; whereas in (27c), it is the adjoining element, i.e. N, not the adjoined-to element, i.e. V2, that undergoes further movement to the matrix verb. Since there are different morphological manifestations of the complementizers in PF, I-to-C movement, according to this account, must take place in syntax, at S-structure at the latest.

The viability of a derivation like that in (23) not only turns on the resolution of the tension between the LIH and the analysis of clitic climbing, it also hinges on another conceptual issue, namely, why INFL has to move to C at all. We cannot appeal to morphological support for some abstract agreement morpheme in INFL, since the finite verb does bear agreement, indicating that the abstract morpheme, if there is any, has attached onto the verb (cf. (24)). Regardless of the issue of agreement, the stranded V analysis, just like the previous two accounts we have considered according to which there is no X⁰-movement, will not account for the lack of *that*-trace effect, as we will see in section 4.2. In the next section, I will propose an analysis of complementizer agreement which has none of the problematic issues raised against analyses considered in the last two sec-

tions and this section. More importantly, I will show in chapter 4 that my proposal gives exactly the right results with respect long-distance subject extraction in West Flemish relative clauses.

3.2.1.4. Expletive Replacement Analysis

Suppose complementizers in West Flemish are inherently specified for ϕ -features. This assumption is quite reasonable, given that the forms of the complementizer do vary with the ϕ -features borne by the local embedded subject. Like other categories, let us assume that complementizers are freely inserted into syntactic structures. This would of course over-generate. Not only do we get grammatical sentences, we also get ungrammatical ones. Overgeneration is of course no harm, if general principles and constraints in the grammar could correctly admit or reject a representation as well- or ill-formed. Particularly for complementizers, I suggest that cases where the complementizer does not agree with the embedded subject be accounted for by Principle of Full Interpretation (FI).

Complementizers like West Flemish *da* or English *that* apparently have very little semantic content. It thus seems plausible that they are expletives (cf. Taraldsen (1986) for Norwegian *som*). In accordance with FI, they must be removed in some way at LF. I suggest a theory of expletive removal according to which expletives can be disposed of in one of two ways: (i) deletion; or (ii) substitution (in the sense of Emonds' (1976) Structure-Preserving Hypothesis). For an element to be deleted, a necessary condition is that it bears no ϕ -features. As for substitution, the set of ϕ -features of the replacing element and that to be replaced must be non-distinct (cf. section 1.6.1 definition). Recalling from section 1.7 that all categories come out of the lexicon with fully specified features, if they have any. At LF, some mechanism of feature-checking applies to ensure that elements bearing a Spec-head relation actually agree. If they do not, then the representation will not have an interpretation, which would consequently be ruled out by FI. With these assumptions, we are now ready to account for complementizer agreement.

Given that complementizers in West Flemish bear ϕ -features, which then means that

they can only be replaced. But what can substitute them? I suggest that they be substituted by the V+I complex when it moves to C⁶, and the substitution is allowed only if the ϕ -features of C and those of V+I match (i.e. if they are non-distinct). If they do not match, then no expletive replacement takes place. Representations with an extraneous, uninterpreted symbol are filtered out by FI.

To see how all these assumptions work together, let us now have a look at a derivation of a grammatical sentence like that in (28a), whose S-structure is as in (28b) and LF-representations are as in (28b) and (28c) respectively (where the indices are again just convenient notations to indicate some particular values of the ϕ -features):

- (28) a. ik wetenda Jan weggoan goat.
 I know that.3SG leave go
 'I know that Jan is going to leave.'
- b. S-Structure:
 ik weten [_{CP} [_C da_i [_{IP} Jan_k [_{VP} weggoan t_j] goat_j+I]]]
- c. LF:
 ik weten [_{CP} [_{I+goat}]_j [_C [_{IP} Jan_k [_{VP} weggoan t_j] t_j']]]

At S-structure, V, INFL, and C each has some syntactic features (relevant here are the ϕ -features), the verb *goat* 'go' moves to INFL. It must be the case that $j=k$ since the subject *Jan* bears the Spec-head relation to INFL. At LF, if the ϕ -features of C and the

⁶Notice however that there is an issue as to whether substitution of C by the V+I complex, of category INFL, is allowed. This is an issue that any V-to-I-to-C-movement analysis for the complementary distribution of complementizers and finite verbs in verb-second languages has to deal with. To the best of my knowledge, this issue has not really been adequately addressed in the literature. Noam Chomsky (personal communication) points out that perhaps there is simply one category INFL which appears in C in addition to the position head position of IP:

- (i) a. West Flemish: [_{IP} T° [_{IP} ...
 b. English: [_{IP} [_{IP} T°

What this entails is that we have double-IP structure instead of a CP dominating an IP. Tense in West Flemish would then be in the head position of the upper IP instead of that of the lower IP as in English. I will not explore this possibility and its consequences any further, however.

complex *goat*+I match (that is, $i=j$), then the complex moves into the C position to replace it, as in (28c)⁷. This being the case, then $i=k$ by transitivity (since $i=j$ and $j=k$), giving us the apparent agreement between the complementizer and the local embedded subject.

Let us next look at a derivation of an ungrammatical sentence like that in (29):

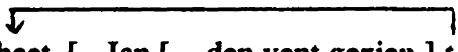
- (29) a. *K weten dan Jan weggoan goat.
 I know that.3PL leave go.3SG
 'I know that Jan is going to leave.'
- b. S-Structure: K weten [_{CP} [_C dan_i [_{IP} Jan_k [_{VP} weggoan t_j] goat_j+I]]]
- c. LF: *K weten [_{CP} [_C dan_j [_{IP} Jan_k [_{VP} weggoan t_j] goat_j+I]]]

As in (28), $j=k$ by spec-head agreement, but *dan*, having the features [3PL], does not have the same ϕ -features as those of *goat*+I complex (i.e. $i \neq j$), the V+I complex will not be able to replace it, as in (29c). Neither can *dan* delete, since it bears ϕ -features. Such a representation is ruled out by FI since it contains a superfluous symbol having no semantic contribution, namely *dan*.

Thus, not only can the expletive replacement analysis account for complementizer agreement without giving a formal status to the relationship between C and the local embedded subject, verb movement to C at LF yields representations in which the finite verbs end up in C positions in both main clauses and embedded clauses:

- (30) a. S-structure: [_{CP} Jan_j [heet_i [_{IP} t_j [_{VP} den vent gezien] t_i]]
 have.3.SG.PAST the man seen
 'Jan saw the man.'
- b. LF: [_{CP} Jan_j [heet_i [_{IP} t_j [_{VP} den vent gezien] t_i]]]

⁷An implicit assumption about the V+I complex is that the almagam agrees with [SPEC, IP] when it moves to INFL. Strictly speaking, only INFL bears a Spec-head relation with [SPEC, IP].

- (31) a. S-structure:
 [_{CP} Marie [peinst [_{CP} da [_{IP} Jan [_{VP} den vent gezien] heet]]]]
 think that3.SG the man seen have.3.SG
 'Marie thinks that Jan saw the man.'
- b. LF:
 [_{CP} Marie [peinst [_{CP} heet_i [_{IP} Jan [_{VP} den vent gezien] t_i]]]]


That is, input representations to the semantic interpretation component of the grammar are uniform with respect to the position of the finite verbs: they are always in a C position. In fact, as we will see in section 4.1.4.2 languages like German and Dutch, for which we have no morphological evidence that they have complementizer agreement, also have the finite verbs uniformly in a C position at LF.

3.2.2. Constructions with *Wh*-movement

In this section, we will first look at some examples showing morphological alternations of the complementizer in relative clauses in West Flemish (section). I show that, with some assumption about feature composition of the complementizers, which might differ in particular languages, the same account given in the section 3.2.1.4 for the complementizer agreement in constructions with no *wh*-movement can be carried over straightforwardly to cases involving *Wh*-movement as well.

3.2.2.1. West Flemish Relative Clauses

As the examples in (32) show , there is an optional *da/die* alternation in relative clauses where a subject is extracted:

- (32) a. Den vent da/*die Jan gezien heet
 the man that seen has
 'The man that Jan saw'
- b. Den vent da/die hier geweest heet
 the man that here been has
 'The man that has been here'

- c. Den vent *da*/**die* Jan peinst *da*/**die* Marie gezien heet
the man that thinks that seen has
'The man that Jan thinks that Marie saw'
- d. Den vent *da*/**die* Jan zegt *da*/*die* hier geweest heet
the man that says that here been has
'The man that Jan says that has been here'

However, as the examples in (32c) and (32d) show, there are positions where *die* may not appear. In order to account for why they may appear only in cases of subject relativization, it is necessary to find out what category *die* belongs to. There are two obvious possibilities for the categorial identity of *die*: (i) it is of the category DP if it is a relative pronoun; or (ii) it is of the same category as that of the complementizers, namely a C°. We now consider these two possibilities in turn.

The first possibility is suggested in Haegeman (1983). However, there is some reason to think that this cannot be correct. Deferring the detailed discussion of relative clauses until Chapter 5, let us assume that relative pronouns are operators of some sort, and that they must move to the Spec of CP at S-structure. Given that West Flemish allows both C and its Spec to be occupied (cf. Chomsky and Lasnik's (1977) doubly-filled COMP filter), as in (33):

- (33) a. K weten niet wien *da* Jan gezien heet.
I know not whom that seen has
'I don't know whom Jan saw.'
- b. K weten niet wanneer *dan* Jan and Marie goan weggoan.
I know not when go leave
'I don't know when Jan and Marie are going to leave.'

then it is not clear why *da* cannot occur with *die*, if we are to assume that *die* is a relative pronoun:

- (34) a. Den vent (**die*) *da* Jan gezien heet
the man seen has
'The man that Jan saw'

- b. Den vent (*die) dan Jan en Marie gezien heen
 'The man that Jan and Marie saw'

Furthermore, if *die* is a relative pronoun, we should also expect it to move to the Spec of the CP that is the adjunct to the predicated NP (section 5.4.1 for justification of this structure for relative clauses):

- (35) [_{DP} Det [_{NP} N [_{CP} die_i [_{C'} . . . [*t_i*]]]]]

For relative clauses that contain only one CP, the configuration in (35) obtains for both West Flemish and English:

- (36) a. [_{NP} Den [_N vent [_{CP} die_i [_{C'} [*t_i* hier geweest heet]]]]]
 'The man who has been here.'
 b. [_{DP} The [_{NP} man [_{CP} who_i [_{C'} [*t_i* has been here]]]]]

But for those that contain more than one CP, the configuration (35) obtains, as the English examples in (37) show:

- (37) a. The man [_{CP} who_i [John says [*t_i* has been here]]]
 b. The man [_{CP} who_i [John says [that Mary saw *t_i*]]]
 c. The man [_{CP} who_i [John says [*t_i* has been here]]]

If we treat *die* as a relative pronoun, then we would expect the West Flemish counterparts of the examples in (37) to be possible. In fact, they are not (cf. (32))⁸:

- (38) a. *Den vent [_{CP} die [Jan *t* gezien heet]]
 'The man that Jan saw'

⁸The ungrammaticality of the example in (38) cannot be due to *that*-trace effect, which is lacking in West Flemish (cf. section 4.4). For illustration, *da* is put in the examples in (38b)-(38c). Inserting any complementizer in that position does not improve grammaticality.

- b. *Den vent [_{CP} die [Jan zegt [da Marie *t* gezien heet]]]
 'The man that Jan says that Marie saw'
- c. *Den vent [_{CP} die [Jan zegt [da [*t* hier geweest heet]]]]
 'The man that Jan says has been here'

Lastly, if *die* is a relative pronoun, we would need to have some way to stop it in the lower clause, in order to account for the fact that *die* appears adjacent to the extraction site, and only there (Haegeman (1983)) (cf. also (32)):

- (39) a. *Den vent [die [Jan zegt [da [*t* hier geweest heet]]]]
 'The man that Jan says has been here'
- ↓
- c. Den vent [da [Jan zegt [die [*t* hier geweest heet]]]]
 'The man that Jan says has been here'

Operators in relative clauses typically do not move part-way, as the ungrammaticality of the English examples in (31) shows:

- (40) a. The man [who [John know [Bill saw *t*]]]
- ↓
- b. *The man [John know [who [Bill saw *t*]]]

The distribution of *die* thus gives us good reason not to assume that it is a relative pronoun. Let us now turn to the possibility that it is of the category C.

In fact, the assumption that *die* is of the category C explains the ungrammaticality of the example in (34) with *die*. Since there is only one C position per clause, *die* thus may not occur with *da*. If *die* is not a relative pronoun but a complementizer, then we have no reason to expect it to appear in the Spec of the CP relative clause. The impossibility of the examples in (38) immediately follows. As can be seen in the grammatical examples of relative clauses in West Flemish, the finite verbs are clause-final, very much like in German and Dutch. We can explain this by saying that just like in ordinary declarative sentences with an embedded sentence, the C position that is occupied by the complementizer is not available for the finite verb to move in.

If *die* is a complementizer, then the structure of relative clauses must involve an empty operator (Chomsky (1977, 1982)), assuming successive-cyclic movement of the operator in cases of relativization that involves more than one level of embedding, just like in those of long-distance extraction in general. Schematically, we can represent the structure of West Flemish relative clauses as in (41):

(41) NP [O_i [da/*die [... [t'_i [da/die [t_i I ...

In fact, as we will see in section 4.4, it can be shown that *wh*-island effects obtain as well in these constructions, which then suggests that there must be operator movement of some sort.

Before we proceed to have a closer look at the structure in (41) for relative clauses, and explain why the complementizer *die* can only occur in the C position immediately adjacent to the extraction site, and only there, let us make the assumption, to be justified in section 3.4, that there is some syntactic feature that differentiates empty operators in relative clauses from interrogative pronouns, which I suggest is the feature [\pm PRED]¹. In particular, we will assume that relative operators have the feature [+PRED]. With this assumption, we can now account for the distribution of *die*.

2.3.2.2. West Flemish *die* as a Complementizer

Suppose the feature [\pm PRED] is one of the ϕ -features that a complementizer may have. If it is included in the set of ϕ -features of a complementizer, then the phonetic specification of the complementizer is *die*; and if it is not, then it would be *da*, *dan* or any one of the other expletive complementizers, depending on what other ϕ -features it has. Crucially, complementizers other than *die* are not [-PRED], they lack the feature [\pm PRED] all together. Since *die* shows up in subject relativization, regardless of the ϕ -features of the extracted constituent:

¹In order for the analysis that follows to work, we have to either assume that the feature [\pm PRED] is included in the set of ϕ -features, or modify slightly the condition for expletive deletion in that deletable elements are those that bear no significant features, which include the ϕ -features and the feature [\pm PRED]. For concreteness, we will assume that the feature [\pm PRED] is a ϕ -feature.

- (42) a. Den vent da Jan gezeid heet [_{CP} O [die [_{IP} t [Pol en Marie gezien heet]]]]]
 the man said have.3SG and seen have.3SG
 'The man that Jan said saw Pol and Marie'
- b. De venten da Jan gezeid heet [_{CP} O [die [_{IP} t Marie gezien heen]]]]
 the men said have.3SG seen have.3PL
 'The men that Jan said saw Marie'

let us assume that *die* has no other ϕ -features. In sum, our assumption about the feature composition of complementizers in West Flemish is that *die* is a complementizer with exactly one the feature [+PRED] (in addition to its categorial feature, of course), and others like *da* have a set of ϕ -features, but not the feature [\pm PRED]. Just like expletive complementizers in non-relative clause, *die* is freely inserted into syntactic structures, and must be replaced by the V+I complex at LF, in accord with FI. In order to see how all these assumptions work, let us consider the S-structure and LF-representation of the example in (32b) with *da* (the indices are here used as convenient notations for particular values of the ϕ -features):

- (43) a. S-Structure: \downarrow \downarrow
 Den vent [_{CP} O_i [_C da_j [_{IP} t_i [_{VP} hier geweest t] heet+I_k]]]]
 the man that.3SG here been have.3SG
 'The man that has been here'
- b. LF-representation:
 Den vent [_{CP} O_i [_C heet+I_k [_{IP} t_i [_{VP} hier geweest] t]]]
 \uparrow

The complementizer *da* has a set of ϕ -features (3SG in particular), but not the feature [\pm PRED]. The operator *O* has a set of ϕ -features (i.e. 3SG, cf. section 3.4) in addition to the feature [+PRED]. These two sets of ϕ -features are non-distinct, even though the feature [\pm PRED] is lacking in the set of features borne by the complementizer *da*: their intersection are non-empty, and the values of the features are not in conflict. The V+I complex *heet+I* agrees with the operator *O* by Spec-head agreement, hence $i=k$. It thus has the same set of ϕ -features as that of the operator. At LF, the V+I complex undergoes head-movement to C, replacing *da*, as in (43b). The LF-representation contains no super-

fluuous symbol, it is thus well-form.ed with respect to FI. The derivation is thus exactly like the one in an ordinary declarative sentence with an embedded clause.

Consider now the S-structure and LF-representation of the example in (32b) with *die*:

- (44) a. S-Structure:
$$\text{Den vent } [_{CP} O_i [_{C'} \text{die}_j [_{IP} t_i [_{VP} \text{hier geweest } t_k] \text{I+heet}_k]]]$$
[+PRED] [+pred] been [+PRED]
 'The man that has been here'
- b. LF-representation:

$$\text{Den vent } [_{CP} O_i [_{C'} \text{I+heet}_k [_{IP} t_i [_{VP} \text{hier geweest } t_k]]]]$$

The operator *O* has the feature [+PRED], among other features. Since the V+I complex bears a Spec-head relation with the operator *O* via its trace *t*, $i=k$. INFL thus has the feature [+PRED]. The complementizer *die* also has the feature [+PRED], by assumption. At LF, the V+I moves to C to replace *die* as in (44b), the desired result.

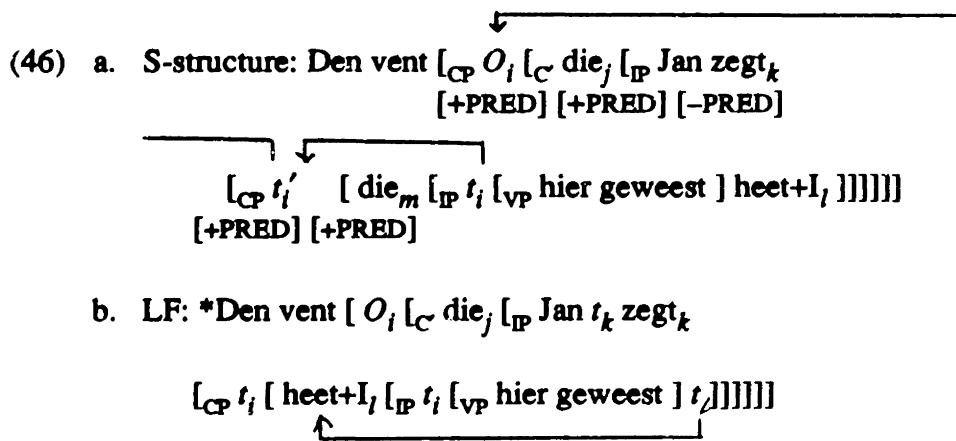
Let us now see how we can account for cases where the presence of *die* induces ungrammaticality. In a sentence like (32a) with *die*, repeated here as (45a), whose LF-representation is given in (45b):

- (45) a. *Den vent die Jan gezien heet.
 'The man that Jan saw'
- b. LF: *Den vent $[_{CP} O_i [_{C'} \text{die}_j [_{IP} \text{Jan}_k [_{VP} t_i \text{gezien}] \text{I+heet}_l]]]]$

By Spec-head agreement, the embedded subject *Jan* and the V+I complex agree, i.e. $k=l$. But the operator *O* with the feature [+PRED] starts out in the complement position within *V'* where no Spec-head relation holds between it and INFL; therefore, $i \neq l$, and INFL has no feature [+PRED]. Consequently, *I+heet* would not be able to replace *die* at LF, and the sentence is then ruled out by FI.

One other case where an occurrence of *die* induces ungrammaticality is one in which

die shows up non-adjacent to the extraction site, as in the example in (32d) with *die*'s in the upper clauses, whose S-structure and LF-representation are given in (46) (assuming *zegt* 'says' is in INFL and the clausal complement has been extraposed, cf. fn 3):



The subject *Jan* occurs in the Spec of the upper IP whose head INFL contains *zegt* 'says' at S-structure. Since *Jan* does not have the feature [-PRED], so would the verb *zegt_k* 'say'. However, *die_j* has the feature [+PRED], but no others. Therefore, the set of ϕ -features borne by the verb *zegt* 'says' and that of *die* are distinct: their intersection being non-empty. So $j \neq k$. Although the V+I complex of the embedded clause *heet+I* picks up the feature [+PRED] by agreeing with the operator *O* via its trace *t*, i.e. $i=l$, this is of no help. This is because it can replace only *die_m*, *die_j* being too far to observe 'Travis's (1984) Head Movement Constraint (HMC) (reducible to the ECP (Chomsky (1989))):

(47) Head movement Constraint (HMC)

An X° may move into the Y° which properly governs it.

(46b) thus would end up with an LF-representation containing one extraneous *die* in the upper CP as in (46b), which would be ruled out by FI. In the expletive replacement account of complementizer agreement, the locality restriction on the distribution of *die* follows directly from the HMC. In fact, the empirical prediction is even stronger. That there is necessarily no non-local complementizer agreement of the sort illustrated in (11) follows from the HMC as well.

It is crucial that in a structure like (46b), the agreement not be that between the com-

3.2.1.1). On the other hand, the agreement between the complementizer and the trace t_i' in its Spec is needed, in Rizzi's framework, in order to detect *Wh*-movement. The complementizer *die* does not show up in constructions without *Wh*-movement. With the requirement that there be a trace in the Spec of *die* (as one of the two conditions for multiple agreement), it can be explained that *die* may appear only if there is *Wh*-movement through its Spec position.

Unfortunately, Rizzi's multiple agreement account of the distribution of *die* in West Flemish does not cover facts about complementizer agreement in constructions involving no *Wh*-movement (cf. section 3.2.1). There are simply no traces as a result of *Wh*-movement. Either we must have a separate mechanism to handle non-*Wh*-movement cases of complementizer agreement not covered by multiple agreement, or else we have to modify multiple agreement itself in some way.

In fact, it seems unnecessary to have multiple agreement. In particular, Spec-head agreement between C and the trace in its Spec is superfluous. To see this, consider the relevant structure with the indices as representing the values of ϕ -feature-sets:

$$(50) \text{ NP } [_{\text{CP}} O_i \dots [_{\text{CP}} t'_i [C^{\circ}_k [t_i I^{\circ}_j$$

Once we have agreement, or rather selection in Rizzi's view, between C and the head INFL of its IP-complement (i.e. $k=j$), C necessarily agrees with the trace in its Spec since it is the trace of the embedded subject, with which INFL agrees (i.e. $j=i$). By transitivity, C and t' agree (i.e. $k=i$). The agreement between C and the local embedded subject is thus guaranteed by transitivity. However, this is exactly the account for cases involving no *Wh*-movement that we discuss in section 3.2.1.2, which does not require multiple agreement. However, we have seen some of reasons why such an account should not be adopted. It thus appears that multiple agreement lacks empirical motivation.

3.3. Complementizer Agreement in French

The paradigm of complementizer agreement in relative clauses in West Flemish is reminiscent of the *que/qui* alternation in some dialects of French (Perlmutter (1971), Moreau (1971), Kayne (1974), Pesetsky (1982a)):

- (51) a. L'homme que tu crois qui/*que chante.
'The man that you think is singing.'
b. L'homme que/*qui tu crois qui chante.
'The man that you think is singing.'

Unlike West Flemish, the *que/qui* alternations obtain in interrogatives as well:

- (52) Qui crois-tu qui/*que chante?
'Who do you think is singing?'

With some assumptions about feature composition of French complementizers, the expletive replacement analysis of West Flemish complementizer agreement can be carried over straightforwardly to French.

Suppose that the set of ϕ -features now includes some feature [+OP] (cf. section 3.4 for justification of this feature), and that there is an expletive complementizer in French, whose phonetic property is *qui* when it has this feature [+OP], but is *que* otherwise¹⁰. Suppose further that both operators in relative clauses and interrogative pronouns also have this feature [+OP]. With these assumptions, we are now ready to account for the *que/qui* alternation in French.

¹⁰It might seem that we are positing two different complementizers here; in fact, they are one and the same. Take the inflectional paradigm. The verbs *run* and *runs* are one and the same. The forms simply reflect the phonetic realization of the same verb, depending the features it has. With the singular Number feature, it would be *runs*, but with the plural Number, it would be *run*. The same reasoning applies to the case at hand here. With the feature [+OP] (recall that it is one of the ϕ -features by assumption), its phonetic realization would be *qui*, but *que* if it does not have that feature. Except for the property of deletability, these two forms have identical properties. This is as expected if they are one and the same.

delete, by FI), the sentence is ungrammatical because of some other reason. In section 4.5.4, I will suggest that the reason why the structure in (54b) is out is because the embedded subject trace t_i lacks a head-governor, thus violating the ECP.

The assumption that *qui* has the feature [+OP] accounts for why *qui* may never show up in constructions involving no *Wh*-movement. Consider a sentence like that in (55a), whose S-structure and LF-representation are given in (55b) and (55c) respectively:

- (55) a. *Jean dit qui Paul est arrivé.
 'Jean says that Paul has arrived.'
- b. S-structure: *Jean dit [_{CP} qui [_{IP} Paul [_{VP} est+I [_{VP} t arrivé]]]
 [+OP]
- c. LF: *Jean dit [_{CP} qui [_{IP} Paul [_{VP} est+I arrivé]]]
 [+OP]

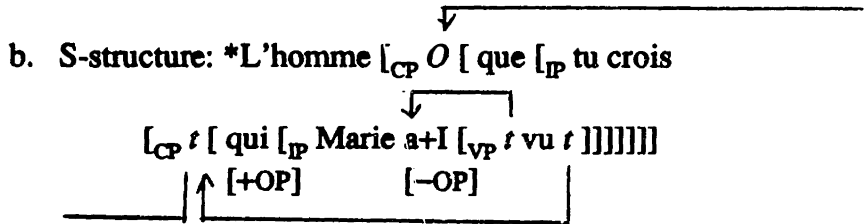
The name *Paul*, not being an operator, does not have the feature [+OP]. It is in the Spec of the embedded IP, so the I+*est* complex does not have the feature [+OP] either. At LF, the V+I complex cannot undergo I-to-C movement to replace *qui*, as in (55c), since *qui* has the feature [+OP], but the complex does not. *Qui* cannot delete, because it bears some feature [+OP]; therefore, the sentence is ruled out by FI. On the contrary, if we have *que* instead of *qui* in (55a), the sentence is well-formed:

- (56) a. Jean dit que Paul est arrivé.
 'Jean says that Paul has arrived.'
- b. S-structure: Jean dit [_{CP} que [_{IP} Paul [est+I [_{VP} t arrivé]]]
- c. LF: Jean dit [_{CP} \emptyset [_{IP} Paul [est+I arrivé]]]

This is because *que* may delete (indicated as \emptyset in (56c)), in fact it must by FI. No principles of the grammar are violated in the representation in (56c), the structure is well-formed.

With object extraction, there is no *que/qui* alternation, as the ungrammaticality of the example in (57a) shows:

- (57) a. *L'homme que tu crois qui Marie a vu.
 'The man that you believe Marie saw.'

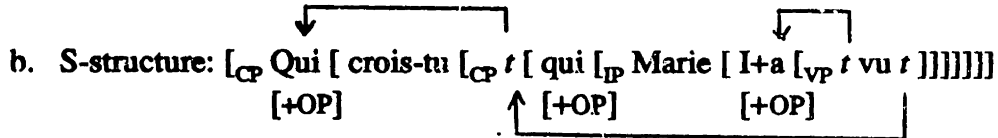


- c. LF: *L'homme [_{CP} O_i [que [_{IP} tu crois



In the LF-representation in (57c), *qui* has the feature [+OP], but the *a+I* complex does not have that feature since *Marie* in its Spec does not have that feature. Therefore, the *V+I* complex cannot replace *qui*. Nor can *qui* delete since it bears the feature [+OP]. The representation is ruled out by FI since it contains an extraneous expletive *qui*. The same explanation can be given for an ungrammatical interrogative like that in (58):

- (58) a. *Qui crois-tu qui Marie a vu?
 'Who do you believe Marie saw?'



- c. LF: * [_{CP} Qui_i [crois-tu [_{CP} [qui [_{IP} Marie [I+a vu t_i]]]]]]]

There are two other conceivable analyses accounting for the *que/qui* alternation in French. Each has certain intuitive appeal, but yields exactly the same empirically wrong results. The first one is suggested in Rizzi (1990a), which apparently recasts Pesetsky's (1982) COMP-contraction Rule (cf. section 5.6.3 for a discussion of the nature of this rule). According to this analysis, in the S-structure (59a) for the example in (51a) with *qui*, where there is some abstract complementizer C, which would be spelled out phonetically as *qui* by virtue of Spec-head agreement between C the intermediate trace *t'*, in-

licated by the sharing of the index INFL¹¹, and *que* would be the form of the complementizer without agreement:

- (59) a. S-structure: L'homme
 [_{CP} O_i [que [_{IP} tu crois [_{CP} t_i' [C_i [_{IP} t_i chante]]]]]]]
- b. PF Spell-out of C: L'homme
 [_{CP} O_i [que [_{IP} tu crois [_{CP} t_i' [qui [_{IP} t_i chante]]]]]]]

There are some conceptual and empirical problems in Rizzi's analysis. Conceptually, if traces are parts of a chain, then agreement with any member of the chain with respect to some property means agreement with the chain as a whole with respect to that property. (Recall that syntactic features can be construed as properties of chains). This is because traces themselves do not have ϕ -features other than those of the head of the chain. If this is so, then in (59) there is as much agreement between the complementizer *que* and the operator *O* as there is between the abstract complementizer C and the trace *t_i'*: both *O_i* and *t_i'* belong to the same chain. Given that *qui* cannot appear in the upper clause in (59), as the ungrammaticality of (60) shows:

- (60) *L'homme qui tu crois qui chante.
 'The man that you think is singing.'

there must be some reason why this is so, albeit it also agrees with the chain headed by the empty operator. One possibility is to say that *que* and the abstract complementizer C are not the same entity, even though both of them agree with the chain headed by the empty operator. This of course would commit us to the existence of two different complementizers.

One other possibility to account for the *que/qui* alternation is to say that the com-

¹¹Indices used in Rizzi's analysis have more than function. It can be a representation of movement relationship, as well as a device which may satisfy a condition on proper government.

plementizer is the one and the same abstract complementizer C, but it is spelled out as *qui* only if there is a trace of an empty operator, not the operator itself, in its Spec position. With this assumption, we can account for the occurrence of *qui* in the lower clause in (59), there being a trace in the Spec of the lower CP, and the impossibility of *que* in the upper clause, there being an operator in the Spec of the upper CP. However, if it is correct to view agreement as property of chains, then this possibility would be excluded. Furthermore, there is empirical difficulty for this latter possibility when we look at a structure with a two-CP relative clause.

In a structure like that in (61a), we would expect, incorrectly, that *qui* can appear in the intermediate clause (cf. Taraldsen (1986b, fn 23)):

- (61) a. *L'homme que tu crois qui Jean pense qui chante
 'The man that you believe that Jean thinks sings'
 b. S-Structure: L'homme [_{CP} O_i [que [_{IP} tu crois

[_{CP} t_i'' [C_i [_{IP} Jean pense [_{CP} t_i' [C_i [_{IP} t_i chante]]]]]]]]]]

- c. PF Spell-out of C: L'homme [_{CP} O_i [que [_{IP} tu crois

[_{CP} t_i'' [qui [_{IP} Jean pense [_{CP} t_i' [qui [_{IP} t_i chante]]]]]]]]]]

Since there is trace in the Spec of the most deeply embedded CP, we correctly predict that *qui* shows up. There is also a trace in the Spec of intermediate CP, but only *que* is possible, as the grammaticality of (62) shows:

- (62) L'homme que tu crois que Jean pense qui chante.
 'The man that you believe that Jean think sings.'

The contrast between (61a) and (62) is unexpected in Rizzi's account, since there is as much Spec-head agreement in the lowest CP as there is in the intermediate CP in (61). In a similar manner, we should also expect, contrary to fact, that the sentence in (63) is grammatical:

- (63) a. *Qui crois-tu qui Jean pense qui chante?
 ‘Who do you believe that Jean thinks is singing?’

- b. S-structure: [_{CP} Qui_i [crois-tu [_{IP} t_i'' [qui [_{IP} Jean pense
 [_{CP} t_i' [qui [_{IP} t_i chante]]]]]]]]

As in the case of (61a), there is a trace in the Spec of both the most deeply embedded CP and the intermediate CP, but only *que* may appear in the intermediate CP:

- (64) Qui crois-tu que Jean pense qui chante?
 ‘Who do you believe that Jean thinks is singing?’

It thus appears that just in the case of West Flemish, appeal to Spec-head agreement in CP would not work for French complementizer agreement. In the next two sections, we will consider some other alternatives, which appear to have the same problems just discussed.

3.3.1. Spell-outs of traces

One other conceivable analysis for the *que/qui* alternation in French is that *qui* is the spell-out of the trace left behind by the relative operator. That is, the S-structures of the examples in (51a) and (52a) with *qui* would be something like (65a) and (66a) respectively, where *e* is some empty complementizer (traces of verb movement are omitted):

- (65) a. S-structure:
 L'homme [_{CP} O_i [que [_{IP} tu crois [_{CP} t_i' [e [_{IP} t_i chante]]]]]]]]
 b. PF Spell-out:
 L'homme [_{CP} O_i [que [_{IP} tu crois [_{CP} qui [e [_{IP} t_i chante]]]]]]]]
- (66) a. S-structure: [_{CP} Qui_i [crois-tu [_{CP} t_i' [e [_{IP} t_i chante]]]]]]
 b. PF Spell-out: [_{CP} Qui_i [crois-tu [_{CP} qui [e [_{IP} t_i chante]]]]]]

The virtue of this analysis is that the phonetic identity of *qui* in the *que/qui* alternation in constructions involving long-distance extraction is related to the interrogative pronoun *qui*, as in a simple matrix question like the one in (67):

- (67) Qui chante?
'Who is singing?'

That they are one and the same entity can be attributed to the *qui* in the *que/qui* alternation being the spell-out of the trace which is a member of a chain headed by *qui*. This would make it look like less than an accident that the *qui* in the *que/qui* alternation and that in interrogatives have the same phonetic matrix.

As in the case of Spec-head agreement analysis for the *que/qui* alternation, this account also has several problems. First, the homonymity argument does not seem to be very compelling. Consider the complementizer *que* and the interrogative pronoun *que*:

- (68) a. Que fais-tu?
'What are you doing?'
b. Jean dit que Marie partira.
'Jean says that Marie will leave.'

If *qui* in the *que/qui* alternation is the spell-out of the trace of the interrogative pronoun *qui*, then what of the complementizer *que*? Is it related to the interrogative *que*? It seems not. Since no movement is involved in (68b), there is no reason to say that *que* in the sentence is derived by a spell-out rule. It thus appears to be an accident that the two *que*'s in (68) are homonymous. If that is so, then it should come as no surprise that *qui* in the *que/qui* alternation and that in interrogatives are also homonymous.

Second, like the Rizzi's analysis, the spell-out account also yields an empirically wrong result when we look at relative clauses that have more than one CP. Consider the S-structures and the representations as a result of PF Spell-out for the examples in (61a) and (63a), given in (69a) and (70a) respectively (*e* is some phonetically empty complementizer, and traces of verb-movement are omitted):

(69) a. S-structure: L'homme [_{CP} O_i [que [_{IP} tu crois

[_{CP} t_i'' [e [_{IP} Jean pense [_{CP} t_i' [e [_{IP} t_i chante]]]]]]]]]

b. PF Spell-out of traces: *L'homme [_{CP} O_i [que [_{IP} tu crois

[_{CP} qui [e [_{IP} Jean pense [_{CP} qui [e [_{IP} t_i chante]]]]]]]]]

(70) a. S-structure: [_{CP} Qui_i [crois-tu

[_{CP} t_i'' [e [_{IP} Jean pense [_{CP} t_i' [e [_{IP} t_i chante]]]]]]]]]?

b. PF Spell-out of traces: * [_{CP} Qui_i [crois-tu

[_{CP} qui [e [_{IP} Jean pense [_{CP} qui [e [_{IP} t_i chante]]]]]]]]]?

In as much as we expect the spelling out of the trace in Spec of the lowest CP, we should expect the same of the trace that is in the Spec of the intermediate CP. But these examples are ungrammatical.

One more piece of evidence indicating that *qui* in the *que/qui* alternation has nothing to do with the interrogative pronoun *qui* 'who' comes from examples like the one in (71):

(71) Quel homme crois-tu qui chante?
 which man think you sing
 'Which man do you think is singing?'

In (71), there is simply no interrogative pronoun *qui* 'who', yet *qui* of the *que/qui* alternation shows up.

Second, if the *qui* in the *que/qui* alternation is the spell-out of the trace of the interrogative pronoun *qui*, then what of the *qui* in relative clauses, there being no overt operators? Why should the complementizer be spelled out as *qui*? Again, it thus seems to be an accident that the *qui* in the *que/qui* alternation is homophonous with the interrogative *qui*.

Lastly, if we treat *qui* of the *quel/qui* alternation as the spell-out of a trace, then the spell-out must be done at S-structure. Otherwise, the trace would violate the ECP at LF. It is not clear if there is an independent principle from which it follows that traces are spelled out at S-structure, but not at PF.

The grammatical patterning of the examples we saw above poses no problem at all to analyses according to which the *qui* in *quel/qui* alternation is a particular instantiation of the abstract complementizer that has the feature [+OP], a feature that both relative operator and overt interrogative *wh*-phrases may have. A *wh*-phrase like *quel homme* ‘which man’ has the feature [+OP] as much as one like *qui* ‘who’ or *que* ‘what’, and the fact that *qui* shows up in the embedded clause when *quel homme* ‘which man’ is extracted from the embedded subject position would have the same explanation as that when a *wh*-phrase like *qui* ‘who’ is extracted from the same position, as given in the discussion of the example in (53). To see this, consider the S-structure and LF-representations in (72a) and (72b) respectively:

- (72) a. S-structure: \downarrow \downarrow
 $[_{CP} \text{ Quel hommes } [\text{ crois-tu } [_{CP} t [\text{ qui } [_{IP} t [\text{ v}_{VP} \text{ sont arrivés }]]]]]]]]$
 [+OP] [+OP]
- b. LF abstract verb movement:
 $[_{CP} \text{ Quel hommes}_i [\text{ crois-tu } [_{CP} [\text{ sont } [_{IP} t_i [t \text{ arrivés }]]]]]]]$
 \uparrow

The verbal agreement in (72) can be accounted for by the assumption that is independently necessary, namely, the finite verb *sont* ‘are’ agrees with the chain (*quel homme*, *t*) via its trace, with which the verb bears a Spec-head relation.

The foregoing discussion of relative clauses and interrogatives containing more than two CPs clearly shows that *qui* may show up only adjacent to the extraction site. We may ask the question why it is so. In the expletive replacement account of complementizer agreement, the answer to this question is just as straightforward as that which we

$$(76) \quad *(\ t \dots \ t \dots) \\ \quad \quad \quad [+HR] \quad [-HR]$$

The *qui* in the *que/qui* alternation is the form of the complementizer when it has a Spec-head agreement (in CP), according to Déprez:

$$(77) \quad \dots \ [_{CP} \ t_i \ [\ \text{qui}_i \ [_{IP} \ t \ \dots] \\ \quad \quad \quad \leftarrow \dots \ _ \uparrow \ _ \]$$

The local movement of the subject as in (77) is permissible, since [SPEC, IP] and [SPEC, CP] are [+HR] positions. Within the conjunctive ECP, the initial trace in [SPEC, IP] must be head-governed as well. Déprez assumes that IPs can be L-marked by agreeing complementizers, which are also proper head-governors. In (77), *qui* thus L-marks the IP, and consequently is able to properly head-govern the initial trace. Antecedent-government is unproblematic, since there is no intervening barrier.

The complementizer *que* is the form without agreement features. What that means is that a structure involving subject extraction with the presence of *que* would be something like (78), where the subject does not move in the local [SPEC, CP], but adjoins to the CP:

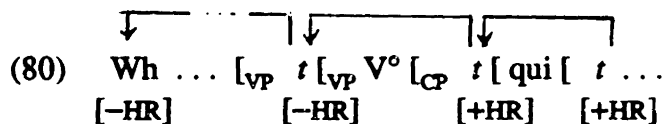
$$(78) \quad * \dots \ [_{CP} \ t \ [_{CP} \ \text{que} \ [_{IP} \ t \ \dots] \\ \quad \quad \quad \leftarrow \dots \ _ \uparrow \ _ \]$$

the complementizer *que* cannot L-mark the IP, the IP in the structure in (78) would be a barrier to both head-government and antecedent-government. There is an alternative derivation for subject extraction with *que*, but the resultant representation is also ruled out:

$$(79) \quad * \dots \ [_{CP} \ t \ [_{CP} \ \text{que} \ [_{IP} \ t \ [_{IP} \ t \ \dots] \\ \quad \quad \quad \leftarrow \dots \ _ \uparrow \ _ \] \uparrow \ _ \]$$

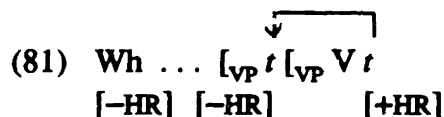
The subject first adjoins to the IP, then adjoins to the CP. The initial trace is antecedent-governed by the IP-adjoined trace, but it lacks a head-governor. Not being L-marked, the (lower) IP is thus a barrier to (external) government.

If the subject is extracted long-distance, however, then after the transition the local CP, it moves to a VP-adjoined position, a [-HR] position. From then on it never moves to a Spec position again, but only to a [-HR] positions (i.e. adjunct positions):



qui can never appear elsewhere because the subject can never land in a non-local [SPEC, CP], the local character of the *que/qui* alternation is thus explained.

That object extraction never trigger the *que/qui* alternation also follows from the constraint against improper movement. Objects must first adjoin to VP, a [-HR] position. From then on, objects can never land on a Spec position, a [+HR] position:



Thus, object extraction can never trigger the *que/qui* alternation.

Although Déprez' analysis accounts correctly for all the facts about complementizer agreement in French and most of the complementizer agreement paradigm in West Flemish. Specifically, it does not cover constructions with no *Wh*-movement in West Flemish (cf. section 3.2.1). There is simply no element in [SPEC, CP] for Spec-head agreement to take place. As in other analyses, the assumption that complementizers can be proper governors and that there is Spec-head agreement in CP is crucial in order for her account to work. It thus have the same issues that we have raised. In addition, it is not clear why complementizers may have the L-marking property, which presumably is a property of lexical category. There is no strong reason to think that complementizers with agreement features are lexical.

To conclude, the proposed expletive replacement account clearly has empirical and

theoretical advantages over the other alternatives we have considered. First, we need not make additional assumptions in X'-theory and agreement theory. Second, the non-existence of non-local complementizer agreement follows from general principles, particularly, the HMC. Third, on a more conceptual ground, it provides direct empirical support of FI. In fact, the expletive replacement account has desirable consequences for theory of proper government as well, as we will see in the next chapter.

3.4. On the Features [PRED] and [OP]

Two features [\pm PRED] and [\pm OP] have been crucially used in the analysis for verb movement to C. In this section, I would like to argue that there is independent motivation for these two features.

3.4.1. Distinction between Operators and Non-operators

There is some differences between expressions like *John* and *the men*, sometimes known as definite NPs (or DPs if noun phrases are assumed to be projections of D, as we do here), on the one hand, and those like *which books* and *every woman*, known as scope-bearing (quasi-)quantifiers on the other (Chomsky (1981)). Whereas the former need not move¹², the latter must (the example in (83b) is grammatical as an echo question, irrelevant here):

- (82) a. I saw John.
 b. John, I saw *t*
- ↓
- (83) a. Who did you see *t*?
 b. *I saw who?

For quantifiers, they are assumed to move at LF (May (1977), Reinhart (1990) argues that quantifiers must move):

¹²Chomsky (1977) suggests that *John* in (82b) is base-generated, and there is some sort of operator-movement, as the representation in (i) shows:

(i) [John [Q [I saw *t*]]]

On this view, *John* does not move at all.

- (84) a. S-structure: John saw every man.
 b. LF: [_{IP} every man [_{IP} John saw *t*]]
-

We thus must have some way to distinguish these two kinds of expressions. One way to achieve this end is to make use of some feature like [\pm OP]. The expressions *the man* and *every man* differ in precisely one respect: the determiner. Thus, if the determiner *the* has the feature [$-$ OP], and *every* [$+$ OP], then under the DP-analysis of noun phrases it falls out naturally that *the man* has the features [$-$ OP] and *every man* [$+$ OP] since their respective head has that feature. If we assume that elements with the [$+$ OP] feature must be in an A'-position at some level of representation (general principles and parameters will decide for individual languages. Cf. *Wh*-in-situ in Chinese and Japanese), but those that are [$-$ OP] need not, then, the movement asymmetry between DPs like *the man* and those like *every man* in (84) immediately would follow.

3.4.2. Differences between Interrogative and Relative Operators

Although operators quite generally move to the Spec of CP by definition, those that appear in interrogatives differ from those that occur in relative clauses with respect to agreement.

In English, the *wh*-phrase *who* in questions requires a singular verb. This can be clearly seen when *who* starts out at S-structure in a subject position of the verb *be* which has different forms for third Persons:

- (85) a. Who is/*am/*are coming?
 b. Who do you think is/*am/*are coming?

This is of course to be contrasted with the case when *who* originates from the object position, where there is no agreement between it and the verb:

- (86) a. Who am I *t* ?
 b. Who are they *t* ?
-

- (87) a. Who do you think I am t ?
 b. Who do you think they are t ?
-

But for the relative operator *who*, we have a different agreement paradigm, putting aside how the agreement in relative clauses actually obtains until section xxx:

- (88) a. The man [_{CP} who [_{IP} t [is/*are coming]]]
 b. The men [_{CP} whc [_{IP} t [are/*is coming]]]
- (89) a. The man [_{CP} who [_{IP} you think [_{IP} t [is/*are coming]]]]
 b. The men [_{CP} whc [_{IP} you think [_{IP} t [are/*is coming]]]]
-
-

Exactly the same difference shows up in French. The interrogative pronoun *qui* requires a singular verb when it occurs as the subject:

- (90) a. Qui est/*sont venu/*venus?
 b. Qui crois-tu qui est/*sont venu/*venus?

but no agreement obtains if it starts out as the object of the verb:

- (91) a. Qui est-il t ?
 'Who is he?'
 b. Qui sont-ils t ?
 'Who are they?'
- (92) a. Qui crois-tu qu'il est t ?
 'Who do you think he is?'
 b. Qui crois-tu qu'ils sont t ?
 'Who do you think they are?'
-
-

Like English, the agreement patterns involving relative operators are different from that of interrogative operators:

- (93) a. L'homme qui est/*sont venu/*venus
 the man that is/are come
 'The man who came'
 b. L'hommes qui sont/*est venus/*venu
 the man that are/is come
 'The man who you think came'
- (94) a. L'homme qui tu crois qui est/*sont venu/*venus
 the man that you think that is/are come
 'The man who you think came'
 b. L'hommes qui tu crois qui sont/*est venus/*venu
 the man that you think that are/is come
 'The man that you think came'


We thus must have some way to distinguish these two kinds of operators. One way to encode the difference is to assume some feature [\pm PRED]. Relative operators would be [+PRED], and interrogative operators [-PRED]. Thus, relative operators with the feature [+PRED] must be in an A'-position at S-structure (cf. section 5.4.3.1 on relative operators), but [-pred] operators need not.

3.4.3. Typology of DPs


One consequence of the two [\pm PRED] [\pm OP] is that there should be four kinds of DPs, representing the four combinations of the features. [+PRED] [+OP] DPs would be relative operators: they must move, and form relative clauses (cf. Chapter 5). The bare *which* and empty operator can only appear in relative clauses (the surface form of the example in (96b) is grammatical as a yes/no question with the verb *write* used intransitively):

- (95) a. The book [_{CP} which [_{IP} John wrote *t*]]
 b. The book [_{IP} *O* [_{IP} John wrote *t*]]
- (96) a. *Which did John write *t* ?
 b. **O* did John write *t* ?
-

[-PRED] [+OP] DPs could be interrogative operators: they must move, and do not form relative clauses:

- (97) a. Which book did John write t ?
 b. *The book [_{CP} which book [_{IP} John wrote t]]
- 

[−PRED] [−OP] DPs would be expressions *Mary* and *the student*: they need not move, and cannot form relative clauses:

- (98) *The man [_{CP} the man [_{IP} John saw t]]
- 

Lastly, [+PRED] [−OP] DPs would be PRO in infinitival relatives:

- (99) a. The man [PRO to fix the sink]
 b. The man [PRO fixing the sink]

Recall that the example in (99) cannot have an operator-variable binding structure as in the tensed relative clause, since the trace of the operator is not Case-marked (for justification of the structure in (100b) and (100d), cf. section 5.4.3):

- (100) a. The man [_{CP} who_i [_{IP} t_i fixed the sink]]
 b. *The man [_{IP} O_i [_{IP} t_i to fix the sink]]
 c. The man [_{IP} PRO fixing the sink]]
 d. *The man [_{IP} O_i [_{IP} t_i fixing the sink]]

If the base-position of the operator in (100b) and (100d) is a non-Case-marked position. If it moves to [SPEC, CP], the chain (O , t) would violate the Chain Condition: there being no Case-marked position in the chain.

With the features [+PRED] [−OP], we can form a predicate out of a relative clause, by virtue of the feature [+PRED], without having an operator moving to an A'-position to create an open sentence (cf. section 5.8.3 for further utility of these features).

3.5. Agreement in CP

As we saw in section 3.2, complementizer agreement in West Flemish cannot be accounted for by Spec-head agreement in CP. The crucial cases are the constructions in which there is no *Wh*-movement. As a matter of fact, there is evidence to the contrary in West Flemish. That is, Spec-head agreement must not obtain in CP, as the grammatical contrast in (101) shows:

- (101) a. *Ik weten nie [_{CP} wavuonen vent [dan [_{IP} Jan [t gezien een]]]]
 that.3PL have.3PL
 'I don't know which men Jan saw.'
- b. Ik weten nie [_{CP} wavuonen vent [da [_{IP} Jan [t gezien een]]]]
 that.3SG have.3PL
 'I don't know which men which men Jan saw.'

The same is true in Bavarian as well (Bayer (1984)):

- (102) a. Du sollst song [_{CP} an wäichan Schuah [dass-st [_{IP} du t wuist]]]
 you should say the which-one shoe that.2SG you want.2SG
 'You should say which shoe you want.'
- b. Des Audo [_{CP} des [wo-ts [_{IP} ihr/es t kaffd hab-ts]]]
 the car which that.2PL you bought have.2PL
 'The car the you bought'

The *wh*-phrases in (102) are third Person, but the agreement on the complementizers *dass* and *wo* are second Person. Thus, not only do we have no agreement in CP in these examples, in fact, we have disagreement.

That there is no Spec-head agreement in CP is perhaps not very surprising, given that even in English, if Spec-head agreement is possible, we would expect that the plural form of the verb *have* in (103) is possible, contrary to fact:

- (103) [_{CP} Which books [has/*have [_{IP} John read t]]]

Comparable examples can be found in French (abstracting away from subject-cliticization), German, and Dutch:

- (104) $[\text{CP} \text{ Quels livres } [\text{as-/*ont- } [_{\text{IP}} \text{ tu } \text{ lu } t]]]$
 which books have.2SG/have.3PLread
 'Which books have you read?'
- (105) $[\text{CP} \text{ Welche Bücher } [\text{hat/*haben } [_{\text{IP}} \text{ du } t \text{ gelesen }]]]$
 which book has have you read
 'Which books have you read?'
- (106) $[\text{Welke Boeken } [\text{heeft/*hebben } [\text{zij } t \text{ gelezen }]]]?$
 which book has have he read
 'Which books has he read?'

In this section, we will consider some Irish and Kinande data, which seem to be prima facie evidence for Spec-head agreement in CP. I show that the Irish data can be given an alternative analysis without assuming that complementizer agreement, but those in Kinanda are unclear at the moment, and conclude the section with a discussion of lack of complementizer agreement that is triggered by adjuncts. The relevant of this section is the theoretical implications that ensue if these are cases of Spec-head agreement in CP. In particular, FI would be seriously undermined any constituent in [SPEC, CP] can trigger agreement on the C° heading that CP. According to our assumptions, complementizers can only be replaced by the finite verb in the local INFL. Therefore, if Spec-head agreement in CP is readily available for non-local subjects, then an agreeing complementizer cannot be replaced, since the V+I complex does not have an agreement relation with non-local subjects. In fact, I will show that the lack of agreement between C° and an adjunct in its Spec follows directly from the expletive replacement analysis of complementizer agreement.

3.5.1. Irish Mutation in Relative Clauses

McCloskey (1979) points out that while the complementizer *go* is used to mark to clausal complement in a declarative sentence like that in (107a), the complementizer *a* must be used if the clausal complement is embedded in a relative clause (the representation a^L with the phonetic matrix [a] is a convenient way to indicate that the complementizer triggers lenition on the following word. The complementizer *go* triggers nasalization, represented as go^N in McCloskey's works. More on Irish mutation below):

- (107) Deir siad go sfléann an t-athair go bpósfaidh Síle é.
say they think the father will marry Sheila him
'They say that the father thinks that Sheila will marry him.'
- (108) An fear a^L deir siad a^L shfléann an t-athair a^L pósfaidh Síle
the man say they think the father will marry Sheila
'The man that they say that the father thinks that Sheila will marry'

The complementizer a^L shows up only in clauses above the extraction site, and the complementizer *go* would appear below it:

- (109) An t-Aire a^L deir siad a^L dúirt go raibh an cogadh thart
the minister say they said was the war over
'The minister that they say said the war was over'

In the option with a resumptive pronoun, the complementizer *a*, represented as a_N , shows up, but it does not trigger lenition on the following word, but nasalization (McCloskey and Hale (1984)):

- (110) a. An rud a^L choinnfonn tú ceilte orthu
the thing keep.PRES you concealed on-them
'The thing that you keep concealed from them'
- b. An rud a^N gcoinnfonn tú ceilte orthu é
the thing keep.PRES you concealed on-them it
'The thing that you keep concealed from them'

It is conceivable that the example in (110a) can have the structure in (111a), with movement of an empty operator from its base-position, but that in (110b) does not involve movement¹³:

- (111) a. An rud [_{CP} O [a^L [_{IP} choinnfonn tú ceilte orthu t]]]
'The thing that you keep concealed from them'
- b. An rud [_{CP} O_i [a^N [_{IP} choinnfonn tú ceilte orthu é_i]]]
'The thing that you keep concealed from them'

Along these lines, the examples in (108) and (109) would have a structure like that in (112):

- (112) An fear [_{CP} O [a^L [_{IP} deit siad [_{CP} t [a^L [_{IP} shfleann an t-anthair
[_{CP} t [a^L [_{IP} phósfaidh Síle t]]]]]]]]]]]]]
'The man that they say that the father thinks that Sheila will marry'
- (113) An t-Aire [_{CP} O [a^L [_{IP} deir siad
[_{CP} t [a^L [_{IP} t dúirt [go [_{IP} raibh an cogadh thart]]]]]]]]]]]]]
'The minister that they say said the war was over'

We might then take the lenition triggered by the complementizer *a^L* is an instance of Spec-head agreement in CP in that if a C° has a trace in its Spec, then the two would agree with respect to some feature, say, [+PRED] (section 3.4). The agreeing feature on C° would then trigger lenition on the following verb. If there is no trace in its Spec, then the C° would trigger nasalization by default (recall that both *a^N* and *go* triggers nasalization).

¹³Since our concern here is the issue of whether there is complementizer agreement, we will not go into the many complicated details of Irish relative clauses. One problem is that the topmost *a* triggers lenition on the following verb in (110a) but nasalization in (110b), despite the fact that the relevant portions of the structure are identical. Cf. also McCloskey (1979) for the view that relativization in Irish does not involve movement

This view that it is the complementizer, not the trace, that triggers the specific mutation pattern on the verb in the structure in (112) and (113) seems reasonable given that in many instances of mutation, adjacency is required. In the examples in (114) and (115), where an attributive adjective would lenite (orthographically represented with an *h* after the lenited consonant), if it occurs next after a feminine noun (Bammesberger (1983)) as in the a-examples, but would not lenite if the adjacency is interfered, as in the b-examples:

- (114) a. Brog mhór
 shoe big
 'A big shoe'
 b. Bróg measartha mór
 shoe reasonably big
 'A reasonably big shoe'
- (115) a. Bliain mhaith
 year good
 'A good year'
 b. Bliain réasúnta maith
 year reasonably good
 'A reasonably good year'

If this is correct, then we apparently have Spec-head agreement in CP. The theoretical implication is that the complementizer *a* cannot delete. Given its quite obscure semantic contribution, it looks like FI is being violated in these instances.

However, there are some cases in which mutation is triggered non-adjacently. An N° lenites if it follows the numeral *dha* 'two', but not *fiche* 'twenty' (cf. Bammesberger (1983) for a description of numerals triggering mutation):

- (116) a. fiche bád
 twenty boat
 'Twenty boats'

- b. dhá bhád
two boat
'Two boats'

While the third Person plural possessive determiner *a* 'they' nasalizes the following noun, the third Person singular feminine *a* 'her' does not trigger lenition:

- (117) a. a mbád
their boat
'Their boat'
- b. a bhád
her boat
'Her boat'

But an intervening element like a numeral between the possessive determiner has no effect on the mutation triggered by the determiner:

- (118) a. a dhá mbád
their two boat
'Their two boats'
- b. a dhá bád
her two boat
'Her two boats'

If adjacency is not required for mutation to occur, then the pattern of verbal mutation in relative clauses may very well be triggered by the trace in [SPEC, CP] rather by the head C°. Therefore, we need not assume that there is Spec-head agreement in CP in Irish. Without agreement features, the complementizer *a* can delete at LF, in accord with FI.

3.5.2. On Kinande Spec-head Agreement in CP

Rizzi (1990a) credits the Kinande examples given in (119) to Schneider-Zioga (1987), which apparently show Spec-head agreement in CP:

- (119) a. lyondi yO kambale alangIra?
 who.CL1 THAT.CL1 Kambale saw
 'Who did Kambale see?'
 b. aBahl Bo kambale alangIra?
 who.CL2 that.CL2 Kambale saw
 'Who did Kambale see?'
 c. Eklhi kyO kambale alangIra?
 what.CL7 CL7 Kambale saw
 'What did Kambale see?'
 d. EBlhi ByO kambale alangIra?
 what.CL8 CL8 Kambale saw
 'What did Kambale see?'

The second element ending in a vowel [o] in the examples in (119), known as the *o*-particles, agrees in noun-class with the *wh*-phrase to its left. If the *wh*-phrase moves to the Spec of CP, and the *o*-particles are in C, then we really have Spec-head agreement in CP in this language. The structure for an example like that in (119a) and (119b) would be like those in (120a) and (120b) respectively, with more information on the verbal morphology (from Schneider-Zioga (1988)):

- (120) a. [_{CP} lyondi [yO [_{IP} kambale alangIra t]]]
 CL1 CL1 SM.PRES-see
 b. [_{CP} aBahl [Bo [_{IP} kambale alangIra t]]]
 CL2 CL2SM.PRES-see

If the structures above are correct, then the problem for linguistic theory would be that the agreeing complementizers cannot be replaced nor be deleted. The representations containing them would thus violate FI. The finite verbs in (120) do not bear an agreement relation with the objects, hence, not agreeing with the complementizer. Therefore, the complementizer cannot be replaced. Bearing agreeing features (relevant here is the

noun class feature), it cannot delete either. In addition, if the [o]-particles do not have any semantic contribution, then the above examples should violate Fl. Clearly, this is not the correct result.

However, the syntax of the *o*-particles is more complicated than the paradigm in (119). According to Hualde (1989), these *o*-particles not only show up in cases like those in (119), they also occur next to a noun phrase that has undergone A'-movement:

- (121) a. Twásóm-er-a ávaná β'ekítábu.
 children book
 'We read the children the book.'
 b. Twásóm-er-a ekítábu ky'ávaná.
 'We read the book to the children.'
 c. Twásóm-er-a ekítábu kyŮ Kánbale.
 We read the book for Kanbale.'

In (121b), the vowel *o* of the *o*-particle has dropped before another vowel. If we have the a noun phrase that does not begin with a vowel in the position of the indirect object *Kanbale* as in (121c), the *o* vowel shows up. Since there is no particular reason to think that the *o*-particles in (121) are C°'s, the categorial identity of the *o*-particles with the same phonetic matrices becomes quite obscure. If we are to treat the *o*-particles in (119) as C°'s, then we are lead to saying that the *o*-particles in (121) are some different entities.

One might conjecture that the *o*-particles appearing in constructions involving *Wh*-movement are the spell-outs of the [+WH] features, and those in the double-object constructions in (121) are instances of something else. Although many questions are raised by the distribution of the *o*-particles, the claim that they are C°'s is not strong until we have a good analysis for them.

3.5.3. Lack of Agreement with Adjuncts

One remarkable missing piece in the complementizer agreement paradigm in West Flemish is that adjunct extraction never triggers any morphological alternation of the complementizer. In other words, adjunct extraction patterns exactly like object extraction with respect to complementizer agreement. For convenience, let us use the term adjunct morphology (Koopman and Sportiche (1986)) to refer to the special morphology (on verbs or complementizers) triggered by adjunct extraction.

As we can see from the examples in (122), the ϕ -features of the embedded subject vary, the morphological changes are visible in the complementizer, just like cases that we have seen so far:

- (122) a. K weten niet [_{CP} wanneer [da [_{IP} Jan goat weggoan]]]
I know not when that.3SG go.3SG leave
'I don't know when Jan is going to leave.'
- b. K weten niet [_{CP} wanneer [dan [_{IP} Jan en Marie goan weggoan]]]
I know not when that.3PL go.3PL leave
'I don't know when Jan and Marie are going to leave.'

But under no circumstances would the form of the complementizer alternate as a result of the changes made in the *wh*-phrase adjunct in its Spec:

- (123) a. K weten niet [_{CP} wavuonen dag [dan [_{IP} Jan en Marie no Brugge goan]]]
I know not which.3SG day that.3PL go.3PL
'I don't know what day Jan goes to Bruges.'
- b. weten niet [_{CP} wavuoren doagen [da [_{IP} Jan no Brugge goat]]]
I know not which.3PL days that.3SG go.3SG
'I don't know what days Jan goes to Bruges.'

The same lack of agreement with adjuncts observed in an adverbial like 'where':

- (124) a. K weten niet [_{CP} woa [da [_{IP} Jan t goat bezoeken]]]
 I know not where that.3SG go.3SG visit
 'I don't know where Jan is going to visit.'
- b. K weten nie [_{CP} woa [dan [_{IP} Jan en Marie t goan bezoeken]]]
 I know not where that.3PL go.3PL visit
 'I don't know where Jan and Marie are going to visit.'
- (125) a. K weten nie [_{CP} wavuoren platsen [da [_{IP} Jan t goat bezoeken]]]
 I know not which.3PL place that.3SG go.3SG visit
 'I don't know which place Jan is going to visit.'
- b. K weten nie [_{CP} wavuonen platsen
 I know not which.3PL place
 [dan [_{IP} Jan en Marie goan bezoeken]]]
 that.3PL go.3PL visit
 'I don't know which places Jan is going to visit.'

As we expect, the paradigm of complementizer agreement in French also lacks agreement with adjuncts. This expectation is borne out. Extraction of adjuncts never triggers the *que/qui* alternation:

- (126) a. Quand penses-tu que Jean est parti?
 'When do you think Jean left?'
- b. S-structure: Quand crois-tu [_{CP} t [que [_{IP} Jean est+I parti t]]]
 [+OP]
- c. LF-deletion: Quand_i crois-tu [_{CP} [∅ [_{IP} Jean est+I parti t_i]]]
- (127) a. *Quand penses-tu qui Jean est parti?
 'When do you think Jean left?'
- b. S-structure: Quand crois-tu [_{CP} t [qui [_{IP} Jean est+I parti t]]]
 [+OP] [+OP]
- c. LF: *Quand_i crois-tu [_{CP} qui [_{IP} Jean est+I parti t_i]]]

For completeness, I include the West Flemish and French data on relative clauses that involve some sort of adjunction extraction:

- (128) a. Den platse [_{CP} O_i [dan/*da [_{IP} Jan en Marie goan t_i]]]
the place that.3PL go.3PL
‘The place where Jan and Marie are going’
- b. Den dag [_{CP} O_i [da/*dan [_{IP} Jan komt t_i]]]
the day that.3SG come.3SG
‘The day when Jan comes’
- (129) a. L’endroit [_{CP} où_i [_{IP} tu crois [que/*qui [_{IP} Jean est allé t_i]]]]
the place where you think is gone
‘The place where you think Jean went’
- b. Le jour [_{CP} où_i [_{IP} tu crois [_{CP} que/*qui [_{IP} Jean est venu t_i]]]]
the day where you think is come
‘The day when you think Jean came’

Since the grammatical patterning of these data receives exactly the same explanation as we have seen above, we will not go through them again.

The agreement facts in West Flemish and French can be explained in a straightforward manner in the expletive replacement account of complementizer agreement. Since the verb does not have agreement morphology with adjuncts, a complementizer agreeing with an adjunct could not be replaced. Representations containing such an agreeing complementizer would violate FI. This is of course different from saying that the verb may never show morphology agreeing with adjuncts (see the discussion of adjunct morphology in Vata below), which is a purely empirical issue. We should note however, that within current assumptions adjuncts do not appear in a Spec position from which it can agree with the verb. Thus, the prediction is that there can never be complementizer agreement triggered by adjuncts.

However, Déprez’ (1990) theory of movement that crucially assumes a constraint against improper movement does entail such a strong prediction. Recall that in her theory (cf. section 3.3.2), movement from a [-HR] position to a [+HR] position is disallowed. Therefore, being base-generated in a [-HR] position, adjuncts can never land in

a Spec position, a [+HR] position. As a result, they can never be in a Spec-head relation with C, hence could not possibly trigger the *quel/qui* alternation.

Some facts about agreement in Vata appear to be *prima facie* counter-examples to the claim that there should be no verbal agreement with adjuncts. Koopman and Sportiche (1986) point out that in Vata when a reason/cause or manner non-PP adverbial adjunct is extracted, the verb shows special morphology. With reason/cause adjuncts, the verb must have a particular suffix -CV or -IE¹⁴:

- (130) a. yĚsŌ ñ dĪdŌ sūŌ lā
 how you cut-M tree-DET WH
 'How come/why did you cut the tree?'
 b. yĚsŌ ñ dĪĪÈ sūŌ lā
 how you cut-M tree Wc[wh]
 'How come/why did you cut the tree?'
 c. sŌ ñ ñá ñ ká sūŌ dĪdŌ/dĪĪÈ/*dĪ
 like-this I said I FUT-A tree-DET cut-M/*cut
 'It's like this that I said you cut a tree.'

and with manner adjuncts, the verb have the suffix as in the previous case , as well as a reduplication of the newly formed verb:

- (131) a. yĚsŌ ñ dĪdŌdĪdŌ sūŌ lā
 how you cutM-cut-M tree-DET WH
 'How did you cut the tree?'
 b. yĚsŌ ñ ká sūŌ dĪdŌdĪdŌ lā
 how you FUT-A treeDET cutM-cutM WH
 'How will you cut the tree?'

The special morphology on the verb cannot occur if there is no *Wh*-movement, or if the extracted adverbial is a PP:

¹⁴C is a consonant copied from the preceding consonant, V is either the vowel E or O, the [-ATR], for the phonological feature Advanced Tongue Root, counterparts of /e/ and /o/, DET and A are for determiners and auxiliaries respectively. Accent-marking are: ' for High tone, ˆ Mid High, ˜ Mid, and ˘ Low. Notations are original to Koopman and Sportiche.

- (132) a. \dot{n} dĪ/*dĪdÒ(dĪdÒ) sūŌ fáfá
 I cut/*cut-M tree-DET quickly
 'I cut the tree quickly.'
 b. \dot{n} ná \dot{n} ká sŌ sūŌ dĪ/*dĪdÒ(dĪdÒ)
 I said I FUT-A like-this tree-DET cut/*cut-M
 'I said I will cut the tree like this.'
- (133) yĪ gbŪ \dot{n} ká sūŌ dĪ/*dĪdÒ
 what reason you FUT-A tree-DET cut/*cut-M
 'Why are you going to cut the tree?'

Although the agreement facts in Vata appear to contradict the claim that adjunct extraction can never trigger agreement, there are many details that we need to look into before we can reach any firm conclusion. It is unsurprising that PPs do not trigger agreement. They typically do not occur in a Spec position other than the final landing site in cases of *Wh*-movement. What is puzzling about the language is that only some specific non-PP adverbials like manner and reason/cause require adjunct morphology on the verb. Why should the semantics of the adverbials make a difference with respect to the adjunct morphology? Spec-head agreement seems to have no semantic correlates, but is a formal expression of certain relationship. In fact, many languages like Chinese and Japanese have to formal markings by Spec-head agreement in languages like English and French. Yet, virtually the same semantics obtains. It is then very obscure whether the verbal morphology triggered by extraction of adjuncts with a certain semantic property (Manner versus Reason) is a case of Spec-head agreement. In fact, if Koopman (1984) is correct in that [SPEC, CP] is to the right of C in Vata, then it could not possibly be.

It thus seems that only a more detailed study of the syntax and semantics of reduplication in the language would reveal adjunct morphology in Vata is and how agreement theory should account for it. In sum, facts about Vata verbal morphology in constructions involving extraction of adjuncts in Vata are not necessarily counterexamples to the claim that (Spec-head) agreement does not obtain for adjuncts.

Thus, whether we can maintain her analysis of the lack of complementizer agreement

in adjunct extraction hinges on the solution to that particular problem. On the other hand, not only does the expletive replacement account cover all the paradigms of complementizer agreement concerning argument extraction we have discussed, it also takes care of the agreement facts regarding adjunction extraction in French, without additional assumptions. This is a welcome result.

3.6. Conclusions

In this section, I proposed that complementizer agreement be accounted for by abstract verb movement to C, as a consequence of FI. Complementizers with agreement features are suggested to be freely inserted into syntactic structures just like other categories, but they eventually have to be replaced. The condition for replacement is that their ϕ -feature-sets be non-distinct. By the HMC, agreeing complementizers can only be replaced by the finite verb in the local INFL. The apparent agreement between the complementizers and the local subject is simply a reflection of the fact that the local subject agrees with the finite verb which at LF replaces the complementizer, with which the verb has a non-distinct set of ϕ -features. In cases where expletive replacement fails, the representations are filtered out by FI.

Complement agreement obtains regardless of *Wh*-movement. Thus, with the expletive replacement analysis, there is no need to enrich agreement theory for complementizer agreement. The theory suggested here affords us an explanatory account based on independently justified principles of grammar.

Chapter 4

Abstract Verb Movement and Proper Government

4.1. Introduction

Facts about extraction of embedded subjects in West Flemish relative clauses we considered in Chapter 3 immediately raise the question of how the traces of the extracted subjects are licensed with respect to the ECP. In this chapter, I argue that the expletive replacement account of complementizer agreement provides a natural explanation for the lack of the *that*-trace effect in some languages, as well has desirable consequences for theory of proper government. Specifically, with the finite verb moves abstractly at LF to C, we need not appeal to complementizers being proper governors. This is one step forward in exploring the possibility that the class of possible proper governors includes all and only lexical categories.

That the lack of the *that*-trace effect in some languages should be accounted for by abstract verb movement to C also gives a new way of looking at the *that*-trace effect. I show that the reason why the effect shows up in languages like English is because of the interaction of the Principle of Economy and a theory of legitimate LF-objects, effectively blocking verb movement to C at LF.

The chapter is organized as follows. Section 4.2 claims that antecedent-government of the subject trace the irrelevant in the *that*-trace effect, and shows that it is head-government that is at issue. In section 4.3, we consider what is the correct structural condition for head-government, as well as the class of proper head-governors. In section 4.4, we will return to the expletive replacement account of complementizer agreement to

see how it bears on the licensing conditions for embedded subject traces. Parametric variations with respect to the *that*-trace are shown in section 4.5 to follow from the possibility of verb movement to C. In section 4.6, we examine some consequences of the conjunctive formulation of proper government. Section 4.7 argues that some apparent cases of ECP violations in constructions involving subject extraction in interrogatives are independent of theory of proper government. Some conclusions are in section 4.8.

4.2. Antecedent Government and the *That*-Trace Effect

When we look at some examples involving subject extraction in West Flemish, English and French, we exhaust all the possibilities of extraction of embedded subjects¹:

- (1) Den vent [_{CP} O [da [_{IP} Jan zegt [_{CP} da/die [_{IP} t hier geweest heet]]]]]
the man that Jan thinks that here been has
'The man who Jan says has been here'
- (2) *The man [_{CP} who [_{IP} you think [_{CP} that [_{IP} t_i left]]]]
- (3) L'homme [_{CP} O [que [_{IP} tu crois [_{CP} qui/*que [_{IP} t_i chante]]]]]?
'The man who you think is singing?'

Abstracting away from the phonetic realizations of the complementizers, let us subsume the three examples in (1), (2) and (3) under a single rubric *that*-trace phenomena (cf. Pesetsky (1982a)). The relevant part of the structure involving a *that*-trace sequence would be that in (4), where XP is some operator:

- (4) XP ... [_{CP} t [C° [_{IP} t ...]]]

We thus have the following three logically possible outcomes of the *that*-trace phenomena in CP-complements to verbs of saying or thinking like English *think* or others

¹The anti-*that*-trace effect in English relative clauses of the sort illustrated in (i) is dealt with in section 5.5:

- (i) The man [_{CP} O [that [_{IP} t left]]]

like it in other languages. It is always good in West Flemish, but always bad, as in the case of English. In French, the *that*-trace sequence as in (4) is sometimes good, and sometimes bad. The *qui*-trace sequence is good, but the *que*-trace is bad. The issue that we now want to address is that why at S-structure, the representations in (1), (2) and (3) all apparently contain the same complementizer-trace sequence in the same environment as in (4), but not all of them are grammatical. As the configuration in (4) shows, there are two traces that might bear on the ECP. One is the original trace in [SPEC, IP], and the other is in [SPEC, CF]. In this section, I argue that it is the original trace that is relevant to the *that*-trace effect.

Assuming an earlier view of clause structure where there is only one COMP position where both complementizer and *wh*-phrases may appear, Lasnik and Saito (1984) argue that the offending trace in the *that*-trace effect is that in COMP (= [SPEC, CP]). They claim that a (bridge) verb in the following schematic structure cannot possibly head-govern the trace in [SPEC, CP]. The crucial example comes from LF adjunction extraction in Japanese. The example in (5a) is ungrammatical with *naze* 'why' understood as modifying the lower clause (labelled right brackets are for reading convenience):

- (5) a. S-structure: *Hanako-ga Taro-ga
 naze sore-o te-ni ireta tte itta koto-o sonnani okotteru no?
 why it.ACC obtained COMP said fact.ACC so much be angry Q
 'Why are you so angry about the fact that Hanako said
 that Taro obtained it?'
- b. LF: * $[_{CP} [_{IP} [_{NP} [_{CP} [_{IP} \text{Hanako-ga}$
 $[_{CP} [_{IP} \text{Taro-ga } t \text{ sore-o te-ni ireta }]_{IP} \text{ tte } t]_{CP} \text{ itta }]_{IP}]_{CP} \text{ koto }]_{NP-O}$
 \uparrow \uparrow
 $\text{sonnani okotteru }]_{IP} \text{ naze }]_{CP} \text{ no?}$
 \uparrow

They consider the LF-representation in (5b) and argue that the original trace is not the issue, since it is possible to have it in the same position, if the clause that contains it is not embedded in a *wh*-island:

(6) a. S-structure: Bill-wa [John-ga naze kubi-ni natta tte] itta no?

why was fired COMP said Q

b. LF: $[_{CP} [_{IP} \text{Bill-wa}$

$[_{CP} [_{IP} \text{John-ga } t \text{ kubi-ni natta }]_{IP} \text{tte } t]_{CP} \text{itta }]_{IP} \text{naze }]_{CP} \text{no ?}$

The diagram shows the LF structure for (6b). It consists of a main CP containing an IP 'Bill-wa' and another CP. This inner CP contains an IP 'John-ga t kubi-ni natta]IP tte t]CP itta]IP naze]CP no ?'. A horizontal line connects the trace 't' in the Spec of the inner IP to the trace 't' in the complement of the inner IP. Two arrows point upwards from this line: one to the trace 't' in the complement of the inner IP, and another to the trace 't' in the Spec of the inner IP.

It must be that both traces in (6b) are properly governed, given its grammaticality. The same two traces appear in the ungrammatical example in (5). The relationship between the two traces, and that between the intermediate trace in COMP and the matrix verb are exactly the same in the two examples. Therefore, it cannot be one of these two relationships that causes the ungrammaticality of the example in (5). The relationship between the extracted adjunct *naze* 'why' and the intermediate trace in COMP is different in the two examples, they point out. There is an NP-barrier between these two elements in (5), but not in (6)². In other words, antecedent-government of the intermediate trace fails in (5) because of the NP-barrier. In a framework of disjunctive formulation of proper government, the intermediate traces of adjuncts in COMP cannot be lexically governed (i.e. head-governed) by the matrix verb³.

However, in the conjunctive formulation of proper government, the grammatical patterns of the examples (5) and (6) can be accounted for in a simple fashion: antecedent-government being required in addition to head-government. Thus, the reason why the example in (5) is ungrammatical is because of the failure of antecedent of the intermediate adjunct trace in [SPEC, CP] (the trace in the Spec of the upper CP would be the offending trace if we assume the derivation in footnote 3).

²It would make no difference if the argument of the matrix predicate is a DP.

³An alternative derivation as in (i) would be grammatical if we allow government of the trace in [SPEC, CP] by the head noun *koto* 'fact':

(i) $[_{CP} [_{IP} [_{NP} [_{CP} [_{IP} \text{Hanako-ga}$
 $[_{CP} [_{IP} \text{Taroo-ga } t \text{ sore-o te-ni ireta }]_{IP} \text{tte } t]_{CP} \text{itta }]_{IP} t]_{CP} \text{koto }]_{NP} \text{-o}$
 $\text{sennani okotteru }]_{IP} \text{naze }]_{CP} \text{no?}$

The diagram shows an alternative derivation (i). It consists of a main CP containing an IP 'Hanako-ga' and another CP. This inner CP contains an NP 'koto]NP-o' and another CP. This innermost CP contains an IP 'Taroo-ga t sore-o te-ni ireta]IP tte t]CP itta]IP t]CP koto]NP-o'. A horizontal line connects the trace 't' in the Spec of the innermost IP to the trace 't' in the complement of the innermost IP. Two arrows point upwards from this line: one to the trace 't' in the complement of the innermost IP, and another to the trace 't' in the Spec of the innermost IP.

While Lasnik and Saito assume that N^o's do not govern into the Spec position of its complement, Chomsky (1986b) suggests that it may be that nouns assign an oblique Case to its complement, hence imposes an inherent barrier to government. This would effectively block government of the trace in the Spec of the upper CP in (i). Cf. section 4.6.4.

In fact, as far as the locality condition for government is concerned, it is difficult to see why the matrix verb, which is closer to the intermediate trace, cannot govern it, but the extracted *wh*-phrase can, despite its being farther away. Returning to the *that*-trace sequence embedded in a non-*Wh*-island, we can see that the trace in [SPEC, CP] is governed by the matrix verb:



The CP is selected by the matrix verb, hence is L-marked by it. There would be no barrier intervening between the verb and the trace in [SPEC, CP]. Head-government of the trace obtains. Since there is no *wh*-islands in which the configuration of (7) is embedded, antecedent-government also obtains.

Chomsky (1986b) suggests that the presence of the complementizer induces a Minimality effect with respect to antecedent-government of the trace in [SPEC, IP], since the complementizer *that* is a closer governor than is the trace [SPEC, CP]. Thus, the original trace in [SPEC, IP] is protected from government by any elements c-commanding the complementizer. When there is no overt complementizer, however, the Minimality effect is absent. The lack of the Minimality effect can be accounted for by assuming that the empty complementizer ϵ with no features is not qualified for the choice of δ in the Minimality Condition given in (8):

- (8) In the structure
 $\dots \alpha [_{\gamma} \dots \delta \dots \beta \dots]$
 α is barrier for β if γ is (a projection, the immediate projection)
of δ , a zero-level category distinct from β .

The reason why the featureless complementizer ϵ is not qualified as a close governor may be because it does not project an immediate projection. That is, the immediate level of projection X' is not present when the head-position of that projection does not contain any features.

Uriaregeka (1988) points out some conceptual problems with Chomsky's account of the *that*-trace effect. Specifically, what would a structure look like if it has a trace in its Spec, a complement, but no intermediate level of projection? Presumably, it would look something like one of the structures in (9):

- (9) a. ... [_{CP} *t'* [_{IP} *t* ...
- b. ... [_{CP} *t'* [_C [_C *e*] [_{IP} *t* ...
- c. ... [_{CP} *t'* [_C *e*] [_{IP} *t* ...
- d. ... [_{CP} [_C *t'*] [_{IP} *t*

The structure in (9a) is impossible since there is no head for the CP. Those in (9b) and (9c) do not conform to X'-theory. In (9b)⁴, the empty C *e* looks like being adjoined to the IP, violating the constraint on adjunction (the adjoining category must have the same bar-level as the adjoined-to category). The structure in (9c) is not possible since it has both a specifier, and an IP-complement immediately dominated by CP. Lastly, the structure in (9d) has the trace *t'* in the head-position of the CP, violating the constraint on XP-movement. XP-movement may not move through a head-position. Thus, none of the structures in (9) is well-formed. Consequently, we cannot appeal to the absence of an immediate projection in order for the trace in [SPEC,CP] to govern the trace in [SPEC,IP].

Uriagereka (1988) then suggests a slightly different analysis for the *that*-trace effect. Leaving aside many technical details in his analysis, let us simply note that in the specific constructions involving a *that*-trace sequence that we are considering here, he proposes that C may govern the trace in [SPEC,IP] only if C is co-indexed with it by agreement:

⁴Uriagereka claims that the upper C projection in (9b) would be a barrier for the embedded subject trace *t*, since it dominates both the empty complementizer *e* and the IP-complement including the trace *t*, but excludes the trace *t'*. However, since barriers are limited to maximal projections (Chomsky (1986b: 14)), the upper C projection is thus not a barrier for the original trace *t*.

- (10) a. Who_i ... [*t*'_i [C° [*t*_i ...
 b. *Who ... [*t*'_i [that [*t*_i ...

The co-indexation of the trace *t*' and the empty C° in (10a) is possible since the latter would agree with the former trivially in that feature-less empty C°'s have no conflicting feature-values with those of the trace⁵. Sanctioned by agreement, the ϕ -features of the trace *t*' in [SPEC, CP] are assigned to the empty C°, which would agree with the trace *t* by transitivity (*t* is co-indexed with *t*'. There is a mixed use of co-indexation here. It is used for both movement and agreement). Having the same index, the C° thus governs and L-marks the IP. As a result, the intermediate trace *t*' can (antecedent-)govern the original trace *t*⁶.

For the structure in (10b), however, the overt complementizer *that* is assumed to have features. Hence, it does agree with the trace in its Spec. Having features, *that* is thus a closer governor than the intermediate trace *t*', preventing it from governing the original trace *t*.

There are some conceptual and empirical problems with Uriagereka's analysis, however. Conceptually, if the empty complementizer *e* may be assigned ϕ -features, it is not clear why it is any less eligible for being a closer governor than the feature-bearing complementizer *that*. The Minimality condition should be violated in both (10a) and (10b). Empirically, the analysis has the same problem as those which invoke some sort of Minimality effect to explain the impossible *that*-trace sequence in general, namely, the problem in accounting for the possible *that*-trace sequence in West Flemish. As we saw in Chapter 3, it is quite possible to have a *that*-trace sequence in West Flemish. This is exactly the opposite of that in English:

⁵Contrary to ours, the implicit assumption here is that two agreeing elements need not have any feature in common here.

⁶In Uriagereka's (1988) system, the ECP is stated as a filter against a trace marked as [- γ], and γ -marking crucially involves government. Therefore, failure of government entails lack of a [+ γ]-feature, hence there is no mention of proper government as such in his analysis.

- (11) a. $\overbrace{\text{Wien peinst Jan}}_{\text{CP}} \left[\text{da} \left[\text{IP } t \left[\text{VP Marie gezien } t \right] \text{I+heet} \right] \right]$
 'Who does Jan think that Marie saw?'
- b. $\overbrace{\text{*Wien peinst Jan}}_{\text{CP}} \left[\left[\text{IP } t \left[\text{VP Marie gezien } t \right] \text{I+heet} \right] \right]$
 'Who does Jan think saw Marie?'

Although the ungrammaticality of (11b) might be attributed to the impossibility of having an empty complementizer quite independently of the ECP, as the obligatoriness of the complementizer in the example in (12) shows:

- (12) Jan zegt da/* \emptyset Marie goat weggoan.
 said that go leave
 'Jan said that Marie is going to leave.'

The grammaticality of (11a) remains unexplained, if we adopt the idea that complementizers with features prevent government.

On the one hand, the account for the *that*-trace effect in complement clauses in English cannot be carried over to West Flemish short of stipulating that complementizers are proper governors in West Flemish but not in English. On the other hand, even internal to English, we would have the problem of the anti-*that*-trace effect in relative clauses (cf. section 5.6). Unless we attribute some special property to the complementizer in relative clauses but not to that in complement clauses, or the other way round, we could not invoke the Minimality Condition. The same sequence appears in the two constructions. We either admit or reject the sequence in both of these two environments. But the fact is that it is good in one, but not the other.

Two conclusions that we can make here are that intermediate traces in [SPEC, CP] can be governed by the matrix verb (we henceforth omit the representation of the intermediate trace in discussions of the *that*-trace phenomena), and that the offending trace in the *that*-trace effect must be the original trace in [SPEC, IP]. In addition, it can be easily seen that the intermediate trace in [SPEC, CP] antecedent-governs the original trace in

[SPEC, IP]. The IP is not a barrier (by stipulation, Chomsky (1986b)). Therefore, the only reason for the *that*-trace effect is head-government of the original trace, an issue that we turn to next.

4.3. On Head-government

If we are to attribute the ungrammatical cases of the *that*-trace sequence to the lack of a head-governor, then we must find out (i) what the possible proper (head-)governors are, (ii) the structural condition(s) for government, as well as (iii) the level of representation at which the ECP applies. Since the three logically possible grammatical outcomes of a *that*-trace sequence are all attested, the question now is how the variations are to be captured. One possible line of approach is that there is some parameters in the three factors that are relevant for theory of proper government. Since these three factors are closely related to one another, we will discuss the class of head-governors in conjunction with the other two factors at the same time.

Consider the relevant part of an S-structure representation containing a *that*-trace sequence in (13):

$$(13) \quad \dots [_{CP} [C^{\circ} [_{IP} t [I^{\circ} V^{\circ} \dots$$

Two obvious candidates for proper governors are the finite verb and the complementizer. Let us now consider these two possibilities in turn. Besides the level of representation where the ECP applies, the structural condition for government is also crucially relevant. Therefore, in each discussion of the two possible proper governors, we will consider some modifications of the structural condition to see if they can be made to work and the consequences that follow.

4.3.1. Head-government by Verbs in INFL

If government is defined in terms of c-command, then the embedded subject trace is not governed by the verb, even when it moves to INFL (at LF in English, cf. some discussion of verb raising below):

$$(14) \quad \dots [_{CP} [C^{\circ} [_{IP} t [I^{\circ}+V^{\circ} \dots$$

This is because the intermediate projection I' branches. Thus, elements that are under the I' -projection would not c-command anything outside the I' . Therefore, if government is defined in terms of c-command, then a proper governor, whatever it might be, in a *that*-trace sequence cannot possibly be structurally under the I' -projection, regardless of the level of representation where the ECP applies. This would give the correct result for English *that*-trace and French *que*-trace sequences (both are ungrammatical), but fail to account for the *that*-trace sequence in West Flemish and the *qui*-trace in French (both are grammatical).

Suppose now that we define government in terms of m-command (Chomsky 1986b), Baker (1988)), and that West Flemish is a language in which the verb move to INFL to pick up inflectional morphology, an independently necessary assumption if we assume there is verb movement to C in the language:

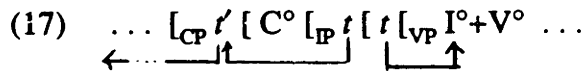
$$(15) \quad \dots [_{CP} [C^{\circ} [_{IP} t [I^{\circ}+V^{\circ} [_{VP} t \dots$$

then indeed the finite verb in INFL head-governs the embedded subject trace t_i , the correct result, since the *that*-trace sequence is always good in the language. What about English, a language that does not allow the *that*-trace sequence? In order to address this question, it is necessary to take a brief digression on verb movement in English.

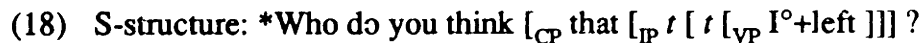
Recall that facts about adverb placement in English call for the assumption that INFL moves to V, not V to INFL (Emonds (1976, 1978)):

- (16) a. John never tells lies.
 b. *John tells never lies.

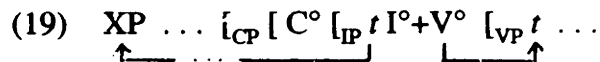
On the assumption that adverbs like *never* are adjuncts to VP, the grammatical patterns of (16) show that main verbs (i.e. thematic verbs, those that assign a θ -role. Cf. Pollock (1989)) like *tell* stays put in its base-position at S-structure:



At S-structure, then, finite thematic verb is not in a position to govern the embedded subject trace. The reason is simply that the verb does not m-command the embedded subject trace: there being a projection, namely, the VP, dominating V but not the trace. The *that*-trace effect in the familiar sentence like (18a) would be accounted for, the embedded verb *left* is not in a position to m-command the embedded subject trace:



It is crucial that the ECP be applied at S-structure, since at LF, the chain (t_j, I_j) is illegitimate (Chomsky (1989)), hence the V+I complex in (17) must raise back to INFL so as to eliminate that illegitimate chain. The structure of (17) at LF would be something like (19), and the S-structure in (18) would become something like (20) after LF-raising of the V+I complex:



In (19), the $I_j + V$ complex does m-command the embedded subject trace t_i , hence governs it. If the ECP applied at LF, then we would incorrectly predict that the English *that*-trace sequence is grammatical. In the representation in (20), the complex $I + \text{left}$ does m-command the embedded subject trace.

The *that*-trace sequence in West Flemish is also correctly accounted for by the assumption that m-command is a condition on government. At S-structure, the verb in INFL does m-command the embedded subject trace. However, there are several cases that an analysis assuming m-command for government and the ECP at S-structure fails. Besides the obvious problem of incorrectly ruling out INFL-lowering at S-structure for languages like English, it also fails to account for cases involving auxiliaries. The fact that an auxiliary like *have* (others are *do* and *be*) or a modal like *will* may precede the main verb as in (21) indicates that they raise to INFL (Jackendoff (1972), Emonds (1976). cf. Poillock (1989) for an explanation of verb-raising in English and French):

- (21) a. John has never told lies.
 b. John will never tell lies.

(22) $[_{IP} [_{I^{\circ}+Aux^{\circ}} [_{VP} \text{never} [_{VP} t [_{VP} V^{\circ}]]]]]$
 ↑

Thus, in a sentence like that in (23) that contains an auxiliary verb in INFL, the embedded subject trace is m-commanded by the auxiliary, and thus should be governed by it. Yet the sentence is ungrammatical:

(23) S-structure: *Who do you think $[_{CP} \text{that} [_{IP} t [_{VP} \text{has} [_{VP} \text{left}]]]]$
 ↑

Such an analysis also fail for French, moreover. Recall that French is also a language in which the verb moves to INFL:

- (24) a. Jean aime beaucoup Marie.
 'Jean loves Marie a lot.'
 b. *Jean beaucoup aime Marie.
 'Jean loves Marie a lot.'

So at S-structure, in a configuration like (15), the I+V complex does m-command, hence governs the embedded subject trace t_i . If the ECP applies at S-structure in French as in English, then we have the correct result for the *qui*-trace sequence, but incorrect for the *que*-trace sequence.

One possible account for the parametric difference between English and West Flemish with respect to the *that*-trace effect, albeit an unenlightening one, is that the structural condition for government differs in the two languages. In particular, if we assume that c-command is the relevant condition for English, and m-command for West Flemish, then the difference would be accounted for, the level of representation at which the ECP applies being irrelevant. Apart from the question how the parametric choice of structural condition for government is related to other differences in the two languages, it would fail to explain the grammatical contrast of the *qui*-trace sequence and the *que*-trace sequence in French. We would either admit (with m-command) or reject (with c-command) both of them.

The conclusions that we can draw from the discussion in this section is that the embedded subject trace cannot be head-governed by the finite verb in INFL or in its base-position, regardless of the structural condition for government as well the level of representation where the ECP applies. In other words, the proper head-governor must be above the IP-projection. Because of the Minimality Condition, it cannot be anything other than the one in the (local) C position:

$$(25) \quad \dots [_{CP} C^{\circ} [_{IP} t [\underbrace{V^{\circ}+I^{\circ}} \uparrow] \dots$$

Putting aside for the moment what exactly can be a proper head-governor, let us consider the structural condition for government.

If the proper head-governor occupies the C position, it would both c-command and m-command the embedded subject trace. It might appear that either command condition would do. However, facts about verb movement suggest that it must be c-command that is relevant for government. This is because at LF, the V+I complex ends up in INFL, regardless whether INFL moves to V or V to INFL at S-structure. If m-command is the structural condition for government, then at LF the V+I would govern the embedded subject trace. In fact, the Minimality Condition would prevent anything outside of the IP-

projection from governing the trace. To sum up our discussion of the structural condition for government, and the position where the head-governor should be, we get a table like (26), where “*” means “incorrect predications”:

(26)		SS	LF		SS	LF		SS	LF
	m-command	ok	ok		*	*		*	*
	c-command	*	ok		ok	ok		*	ok
		West Flemish			English			French.	

As indicated in the table, there is exactly one combination that would give us the correct result. That is the combination of having c-command as the structural condition for head-government, and LF as the relevant level of representation where the ECP applies.

Saito (1984) is thus correct in that the relevant structural condition for head-government is c-command, and many others who suggest that the ECP applies at LF (Kayne (1981c), Koopman (1981), Jaeggli (1982) and Rizzi (1982) among many others). What is significant is that we now have grounds to exclude m-command and S-structure as being the irrelevant considerations for theory of proper government.

4.3.2. Head-government by Complementizers


The other obvious candidate for proper head-governor is the complementizer C. The question now turns on whether we should allow complementizers to be proper head-governors. Before we address this general issue, let us see how the disparate patterns of grammaticality might be accounted for if they can in principle be proper head-governors.

To account for the difference between the grammatical *that*-trace sequence in West Flemish and the sequence *qui*-trace in French on the one hand, and the ungrammatical *that*-trace sequence in English and the sequence *que*-trace, we have to say that complementizers in West Flemish and French *qui* are proper head-governors, but those in


English and French *que* are not. This is perhaps due to the presence of some features in French *qui* and its counterparts in West Flemish, which have morphological manifestation, and a lack of such features in English complementizers and French *que*. On this view, then, the reason why a *that*-trace sequence is good or bad depends on the inherent nature of the complementizer itself, namely, whether it has some features or not. However, there seems to be good reason to assume that the class of proper head-governors should not include complementizers, an issue we take up directly below.

4.3.3. The Class of Proper Head-governors

In order to find out whether features such as ϕ -features are relevant to government, let us look at the uncontroversial proper head-governors that clearly may have ϕ -feature morphologies, namely, verbs. In a sentence like that in (27), where the object *what* has been extracted, leaving a trace *t*:




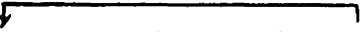


(27) What does John think that Mary reads *t* ?


the object trace *t* is clearly properly head-governed by the verb *reads*, which does have ϕ -features, as indicated by the singular agreement morpheme *s* on the verb. Given the ECP and the grammaticality of the sentence, it must be that the object trace in (27) is properly governed. However, in a sentence like that in (28), the verb 'eat' clearly has no ϕ -feature morphologies, since it is non-finite and has no agreement at all:

(28) What did you want to eat *t* ?


Yet, the object trace *t* is still properly governed by the non-finite verb *eat*, given its grammaticality.

Consider now the Dutch sentence in (29) (Bennis (1986)), the German sentence in (30) (Sternefeld (1989)), and Icelandic (118) (Maling and Zaenen (1978), putting aside the question of whether or not there is empty operator in (31)):

- (29) a.  Wie zei je [dat [*t* die appel opgegeten heeft]] ?
 who think you that the apple eaten has
 'Who do you think ate the apple?'
- b.  Die man denk ik niet [dat [*t* veel haast zal maken]]
 that man think I not that much haste will make
 'That man I don't think will hurry much'
- (30) a.  Wer glaubst du, [dass [*t* mich gerufen hat]] ?
 who think you that me called has
 'Who do you believe has called me?'
- b.  Die Leute, die (wo) du glaubst, [dass [*t* sowas getan haben könnten]]
 the people who COMP you believe that this done have could
 'The people who you believe that could have done this'
- (31) a.  Þetta er maðurinn_i, sem þeir halda [að [*t*_i sé of heimskur]]
 this is man-the that they think that is too dumb
 til að vinna verkið.
 in order to do job-the
 'This is the man that they think is too dumb to do the job.'
- b.  Það er Ólafur_i, sem þeir segja [að [*t*_i muni koma]]
 it is Olaf that they say that would come
 'It is Olaf who they say would come'

Since no specific morphologies in accord with the ϕ -features borne by the embedded subjects show up on the complementizers in the sentences in (29)-(31), there seems to be no independent motivation for assuming that Dutch *dat*, German *dass* and Icelandic *að* have ϕ -features. Yet, the *that*-trace sequences in (29)-(31) are allowed. If we take complementizers to be proper head-governors, then ϕ -features are again irrelevant.

We might conjecture that the ability of assigning θ -role (i.e. theta-government (Stowell (1981), Chomsky (1986b)), or Case is relevant to proper government. Thus, verbs like *like* and *eat* are thus proper head-governors since they assign both a θ -role and Case to their complements. However, a verb like *expect*, which assigns Case but no θ -role to the embedded subject in (32), can also be a proper head-governor, as the grammaticality of (32) shows:

(32) Who do you expect [*t* to see John]?



Additional evidence indicating that quite generally the ability to assign θ -roles or Case is irrelevant to the qualification of being a proper head-governor comes from constructions involving modals. The verb *must* in (33) seems to assign neither a θ -role nor Case to its VP-complement, yet we must assume that it properly head-governs the trace *t* left behind by the VP:

(33) (John said he must fix the car tomorrow, and)

[fix the car], he must *t*



Even if we assume that the ability to assign θ -roles or Case is a requisite for the property of being a proper governor, it would be of no help. This is because complementizers do not seem to have θ -role or Case-assigning ability⁷; these two functions are then irrelevant to complementizers. If this is correct, then it is unclear what is the property that complementizers in West Flemish, German, Dutch, and French *qui* have that makes them proper governors, and why English *that* and French *que* lack it.

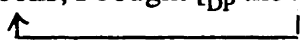
When we consider the question of characterizing the set of proper governors, we even have better reason not to include complementizers in the class. Complementizers do not all behave alike with respect to the possibility of occurring next to a trace. This is particularly true in French where the *qui*-trace sequence is good, but the *que*-trace sequence is bad, as we have seen. So the class of complementizers is not homogeneous with respect to the *that*-trace sequence even within the same language. To regard them as

⁷Koopman (1984) suggests that verb movement to C in Germanic languages like German and Dutch is motivated by Case theory. In embedded clauses where the verb does not move to C, it must be that complementizers assign Case to the subject in [Spec, IP] (cf. also Platzack (1983, 1986a, 1986b)). However, Nominative case is mostly associated with Tense (i.e. Nominative case is assigned by the element bearing Tense). We thus need to make some special assumption about how the Tense morphology is attached to the verb in embedded clauses, given that the complementizer must have Tense in order to assign Case to the embedded subject. One further problem of assuming Tense in C is that the morphology on the complementizer does not alternate with respect to present/past Tense distinction. Even if Cs can assign Case, if the argument presented in the text against the Case-assigning ability as the qualification for proper head-government is correct, then we still cannot appeal to Case theory to include complementizers as proper head-governors.

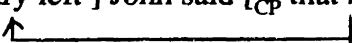
proper governors would make the characterization of the class of proper governors very difficult, if possible at all. Given that the categories that often appear to act as proper governors are those definable in terms of lexical categories, namely, in terms of $[\pm N, \pm V]$, as Chomsky (1981) suggests, it thus seems reasonable to keep this well-defined class to the exclusion of complementizers. Besides this conceptual advantage, there is another advantage in restricting the class of proper head-governors to that of lexical categories.

Empirically, we make a strong claim about natural language, namely, no language may have any category other than a lexical category as a licenser of a trace. This claim seems to be supported in a variety of constructions in English that involve extraction of complements of a functional category.


Assuming the DP-analysis for noun phrases (Barwise and Cooper (1981), Brame (1981), Szabolcsi (1983), Abney (1987) and others), extraction of an NP complement to a D is impossible:

(34) *Books, I bought [_{DP} the *t*]


The ungrammaticality of (34) can be accounted for if determiners, being non-lexical categories, are not proper head-governors. Furthermore, extraction of IPs is also not possible⁸:

(35) a. John said [_{CP} that [_{IP} Mary left]
 b. * [_{IP} Mary left] John said [_{CP} that *t*]



⁸Note that we cannot appeal to Case theory to rule out the example in (35b) as we can in that in (i):

(i) * [_{IP} Mary to be intelligent] John believed *t*


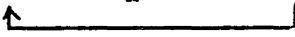
Hoekstra (1984) argues that *Mary* is not assigned Case in (i). In (35b), however, *Mary* is assigned nominative case.

The ungrammaticality of (35b) would automatically follow if functional categories, which complementizers are, are not proper governors. One explanation for the obligatory presence of an auxiliary verb *do* is that the trace of the extracted VP in (36) must be properly head-governed by a lexical category (cf. Zagana (1988) for an alternative view), although there is one complication in showing this point:

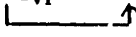
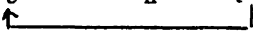
(36) a. (John said that he would fix the car), and

$$[\text{VP fix the car}] \text{ he } *(\text{did}) t$$


Recall that English is a language where INFL lowers to V at S-structure. In principle, there are two derivations for the example in (36) without the auxiliary *do*, which are ungrammatical. In one derivation, INFL has yet to lower to V, the VP is fronted:

(37) * ...
$$[\text{VP fix the car}] [\text{IP he } [\text{INFL } t]]$$


The ungrammaticality of (37) can be attributed to INFL being stranded, under the assumption that it must be morphologically supported (Lasnik (1981)). Another derivation is one in which INFL has lowered to V, and the VP is subsequently fronted:

(38) INFL-lowering:
$$[\text{IP he } [t [\text{VP fix+I the car}]]]$$

 VP-fronting:
$$*[\text{VP fix+I the car}] [\text{IP he } [t t]]$$


There are two traces in (38) after VP-fronting: one is the trace left behind by INFL-lowering, and the other is that of the fronted VP. As an alternative, we might attribute the ungrammaticality of the example in (38) to the trace of INFL violating the ECP (it has no head-governor), rather than that of the VP. That is, the ill-formedness of (38) does not conclusively show that the offending trace is the VP-trace, hence does not support the claim that the insertion of an auxiliary *do* is to provide it with a lexical category to properly head-govern the trace. Nevertheless, the question still remains as to what the status of the VP-trace after insertion of an auxiliary with respect to the ECP. That is, is

the trace left behind by the fronted VP properly head-governed or not? If we are to maintain the ECP maximally general, then we must say that the VP-trace is properly head-governed. More particularly, the proper head-governor is the inserted auxiliary.

If we take that view that a tensed clause without a complementizer is an IP, then it is possible to show that INFL is not a proper governor. Consider the example in (39a) where INFL has lowered to V and the VP is subsequently fronted:

- (39) Mary said that John would fix the car, and
- a. * $[_{VP} \text{fixed the car}] [_{IP} \text{she suspects } [_{IP} \text{he } t \ t]]$
- b. $[_{VP} \text{fix the car}] [_{IP} \text{she suspects } [_{IP} \text{he will } t]]$

In (39a), the trace of INFL is properly head-governed by the matrix verb (cf. Baker (1988) for similar cases of noun-incorporation). The ungrammaticality of the example must then be due the trace of the fronted VP. In sum, it seems that empirical evidence for non-lexical categories as non-proper governors is considerable.

One partial solution to the problem of characterizing the class of proper governors if complementizers were to be included in the class is to say that they generally are not proper governors, but can be turned into one if certain conditions are met (Rizzi (1990a)). On this view, the reason why C in (13) is a proper head-governor is because when the subject moves into the Spec of the embedded CP, by Spec-head agreement, the index of the trace is transferred to the C° (Pesetsky's (1982) COMP-contraction Rule, discussed in section 5.6.3, also Lasnik and Saito (1989)):

- (40) Wh ... $[_{CP} [C^\circ [_{IP} t [I^\circ \dots]]]$

If this is correct, then the grammatical *that*-trace sequence in West Flemish and the French *qui*-trace sequence is accounted for. C in (40) is now turned into a proper governor by transferring the index of the intermediate trace by Spec-head agreement. It is also in a structural position from which it governs the embedded subject trace:

- (41) Den vent [_{CP} O_i [die_i [_{IP} t_i hier geweest heet]]]
 ‘The man who has been here’
- (42) Qui_i crois-tu [_{CP} [qui_i [_{IP} t_i chante]]]
 ‘Who do you think sings?’

Besides the specific empirical problems that we raise in section 3.2.2 for the idea that complementizer agreement obtains by Spec-head agreement in CP (cf. also sections 3.5 and 5.8 for a general discussion of agreement in CP), there are some conceptual issues that we need to address if we are to assume that C^os can be turned into proper head-governors. First, as outlined in section 1.4.2, although it seems legitimate to use indices to indicate that a certain relationship hold (e.g. an antecedent-trace relationship in cases of movement), or that the ϕ -feature sets of the elements bearing the indices are the same. It is not obvious why the sharing of indices has a bearing on proper government, if they are but notational conveniences with no theoretical standing.

Second, it is not clear how parametric differences with respect to the *that*-trace sequence are to captured in a natural way short of assuming that Spec-head agreement or index-transferring is not available in languages that show the *that*-trace effect (cf. Koopman (1983)). To sum up our discussion of the last two sections, we can draw the following crucial conclusion concerning proper government of embedded subject traces in the *that*-trace sequence: the head-governor must be in the C position. Since we have reasons to assume that all and only lexical categories are proper governors, there must be a head-governor in the C position that is not a complementizer. In the next section, I will show how this would come about.

4.4. Expletive Replacement and Proper Government

We recall from section 3.2.1.4 that expletive complementizers like West Flemish *da* ‘that’, French *quel/qui* and English *that* have little semantic content, and that they must be removed by the at LF in accordance with FI. Specifically for those that bear ϕ -features, they can only be replaced, and the element that can replace them is the local V+I complex. Schematically, the structures in which expletive complementizers have been replaced may be represented as something like (43):

$$(43) \text{ Wh}_i \dots [{}_{\text{C}} \text{I+V} [{}_{\text{IP}} t_i [{}_{\text{I}'} t \dots]]] \dots$$

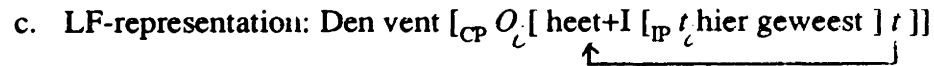
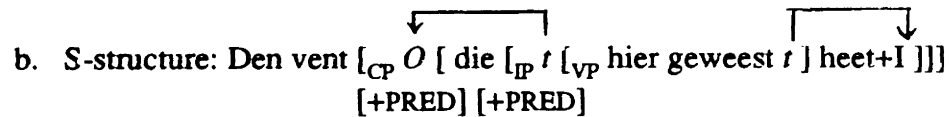
The condition for expletive replacement is that the set of ϕ -features of the V+I complex must be non-distinct from those of the expletive. This is perhaps due to a more general constraint on substitution in that the replacing element must have a non-distinct set of features with that of the element that is being replaced (cf. Chomsky’s (1965) Recoverability Condition on Deletion). At LF, after replacement of the expletive complementizer, the V+I complex is in the C position where it bears a government relation with the embedded subject position.

Since the V+I complex is lexical, it properly head-governs the embedded subject trace in (43). As we discuss in section 4.2, antecedent-government also obtains in constructions containing a *that*-trace sequence, consequently, proper government of the embedded subject results. Schematically, the relevant parts containing a complementizer-trace sequence after expletive replacement would be as in (44):

$$(44) \text{ Wh}_i \dots [{}_{\text{CP}} [\text{I}^\circ + \text{V}_j^\circ [{}_{\text{IP}} t_i [{}_{\text{I}'} t_j \dots]]]] \dots$$

Let us now have a look at some relevant examples in order to see how the above ideas are at work. Consider the West Flemish sentence in (45a) and its S-structure and LF representations in (45b) and (45c) respectively:

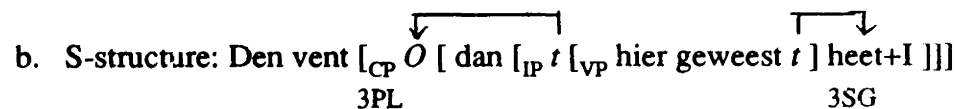
- (45) a. Den vent die hier geweest heet
 'The man that has been here'



At S-structure, *heet* has moved to INFL. By Spec-head agreement, it agrees with the operator *O* which has the feature [+PRED]. So *I+heet* has the feature [+PRED]. *Die* inherently has the feature [+PRED], and none others; therefore, at LF, *I+heet* replaces it, and the resulting LF-representation is a configuration in which *I+heet* head-governs the subject trace. The operator *O* also antecedent-governs it. Therefore, proper government of the embedded subject trace obtains.

Let us now see how proper government might fail. If instead of *die*, we have *dan*, the third person plural form of the complementizer, as in (46):

- (46) a. *Den vent dan hier geweest heet
 that.3PL have.3SG
 'The man that has been here'



The complementizer *dan* has no feature [+PRED], it thus cannot be replaced by the V+I complex, since their Number features do not match. The LF-representation in (46c) would then violate FI. Since *dan* can neither be replaced, nor delete, and is thus extraneous. It also violates the ECP. The subject trace fails to be properly head-governed, hence not properly governed.

Recall that *da* is possible instead of *die* in (45). To see this, consider the derivation of the example in (47 a):

- (47) a. Den vent da hier geweest heet
 'The man that has been here'

b. S-structure: Den vent [_{CP} O [da [_{IP} t [_{VP} hier geweest t] heet+I]]]
 [+PRED.3SG]that.3SG

b. LF-representation: Den vent [_{CP} O_i [heet+I [_{IP} t_c hier geweest] t]]

Although *da* does not have the feature [\pm PRED], it has other features which match some of those of the operator (third Person singular). Since the values of the feature [\pm PRED] are not in conflict, the ϕ -feature-sets of *da* and the operator *O* are non-distinct. The V+I complex, agreeing with the operator, can move to replace the complementizer *da* at LF, as in (47), which is well-formed with respect to FI.

Consider now the French example in (48a) and its S-structure and LF-representation in (48b) and (48c) (irrelevant traces omitted):

- (48) a. *L'homme que tu crois que chante
 'The man that you think sings'

b. S-structure: L'homme [_{CP} O [que [_{IP} tu crois [_{CP} que [_{IP} t [chante+I]]]]]]
 [+OP] [+OP]

c. LF: *L'homme [_{CP} O_i [\emptyset [_{IP} tu crois [_{CP} \emptyset [_{IP} t_c chante+I]]]]]

The *que* in the Spec of the upper CP in (48) is not a problem, since it may occur in the same position in the grammatical example in (49):

- (49) L'homme que tu crois qui chante
 'The man who you think sings'

At issue here is the *que* in the Spec of the lower CP in (48), which does not have the feature [+OP]. Agreeing with the operator *O* (via the trace *t*), the V+I complex has the feature [+OP]. Therefore, *chante+I* will not be able to replace *que*. Consequently, the LF-representation in (48c) would be exactly as their S-structure representation, in which

the embedded subject trace lacks a head-governor. It is thus ruled out by the ECP. The same explanation can be given to the example in (50a):

- (50) a. *Qui crois-tu que chante?
 'Who do you think sings?'
 b. S-structure: $[_{CP} \text{ Qui } [_{+OP}] [_{CP} \text{ que } [_{IP} t [_{+OP}] \text{ chante+I }]]]]$
 c. LF: $*[_{CP} \text{ Qui } [_{+OP}] [_{CP} \emptyset [_{IP} t [_{+OP}] \text{ chante+I }]]]]$

The complementizer *que* may delete, however, since it bears no features. But the deletion of *que* is of no help because the finite verb *chante* is still not in a position to properly govern the trace *t* if it stays in INFL. We will return to the question why the verb does not move to C after deletion in section 4.5.4 where we discuss the *that*-trace effect in English, a case completely parallel to *que*-trace in French.

Now, why are the examples in (51a) and (52a) grammatical? This is not difficult to see when we look at their S-structure and LF-representations:

- (51) a. L'homme que tu crois qui chante
 'The man that you think sings'
 b. S-structure: $\text{L'homme } [_{CP} O [_{+OP}] [_{CP} \text{ que } [_{IP} \text{ tu crois } [_{CP} \text{ qui } [_{IP} t [_{+OP}] \text{ chante+I }]]]]]]$
 c. LF: $\text{L'homme } [_{CP} O_i [_{+OP}] [_{CP} \text{ que } [_{IP} \text{ tu crois } [_{CP} \text{ qui } [_{IP} t_i [_{+OP}] \text{ chante+I }]]]]]]$
 (52) a. Qui crois-tu qui chante?
 'Who do you think sings?'
 b. S-structure: $[_{CP} \text{ Qui } [_{+OP}] [_{CP} \text{ crois-tu } [_{CP} \text{ qui } [_{IP} t [_{+OP}] \text{ chante+I }]]]]]]$
 c. LF: $[_{CP} \text{ Qui}_i [_{+OP}] [_{CP} \text{ crois-tu } [_{CP} \text{ qui } [_{IP} t_i [_{+OP}] \text{ chante+I }]]]]]]$

As in (48) and (50), the V+I complex has the feature [+OP], which *qui* also has. At LF,

the complex can move to C to replace *qui*, as the LF-representations in (51c) and (52c) show. Now the V+I complex is in a position to head-govern the trace *t*. The ECP is observed, and the representations are thus well-formed.

From our discussion of head-government of traces of embedded subjects emerges an important conclusion about the level at which the ECP applies: it must not apply at S-structure, but at LF. In West Flemish, the embedded subject trace is not properly head-governed at S-structure. At this level of representation, the finite verb is still in INFL. Expletive-replacement does not take place until LF. In French, if the ECP applied at S-structure, we would correctly rule out the *que*-trace sequence, but would incorrectly rule out the *qui*-trace sequence as well. The complementizer *qui* is not replaced, and the verb does not end up in the C position, until LF. Moreover, independently of head-government of the embedded subject trace, given that INFL in English lowers to V (cf. section 4.3.1), the trace of INFL would violate the ECP if it applied at S-structure. The ECP requires the raising of V+I from the base-position of V to INFL at LF, which only works if it applies at LF.

Notice that antecedent-government obtains in the constructions containing a *that*-trace sequence, as the grammaticality of the examples in (51a), (52a) and (45). It thus might appear that antecedent-government is irrelevant for proper government. Nevertheless, antecedent-government is crucially necessary for proper government to obtain, particularly when we deal with extraction out of *wh*-islands, the constructions which we discuss in section 4.6.1.

4.5. Parametric Variations in the *That*-Trace Effect

In this section, we consider the possibility of verb movement to C at LF after expletive-deletion. I argue that languages having no *that*-trace effect have abstract verb movement to C, a property that these languages independently have, and those that show the *that*-trace effect have no such movement. In addition, the Principle of Last Resort effectively prevents verb movement in the latter group of languages.

4.5.1. Expletive Deletion and Proper Government

Expletives bearing no ϕ -features are allowed to delete at LF (cf. section 3.2.1.4). In fact, they must delete in accordance with FI. Examples of deletable expletive complementizers are French *que*, and English *that*. Consider the (simplified) S-structures in the a-representations in (53)-(56) and their LF-representations after deletion of the expletive complementizers as in the b-representations (\emptyset indicates the deletion site)⁹:

(53) a. S-structure: Jean crois [_{CP} [que [_{IP} Marie est intelligent]]].
'Jean believes that Mary is intelligent.'

b. LF: Jean crois [_{CP} [\emptyset [_{IP} Marie est intelligent]]].

(54) a. S-structure: Qui crois-tu [_{CP} [que [_{IP} Marie a vu *t*]]]?
'Who do you believe that Mary saw?'

b. LF: Qui_i crois-tu [_{CP} [\emptyset [_{IP} Marie a vu *t*_i]]]?

(55) a. S-structure: John believes [_{CP} [that [_{IP} Mary is intelligent]]].

b. LF: John believes [_{CP} [\emptyset [_{IP} Mary is intelligent]]].

(56) a. S-structure: Who does John believe [_{CP} [that [_{IP} Mary saw *t*]]]?

b. LF: Who_i does John believe [_{CP} [\emptyset [_{IP} Mary saw *t*_i]]]?

A question that naturally arises is that after expletive-deletion, what stops the verbs from moving to the vacated C positions? For object extraction as in the examples in (53)-(56),

⁹Since the deletion of the complementizer *that* is at LF, the sentence in (56a) is not related to that in (ia) in that one is not derived from the other, which has the LF-representation (ib) identical to that in (56b):

(i) a. Who does John believe Mary saw?

b. S-structure: Who does [_{CP} John believe [_{CP} [*e* [_{IP} Mary saw *t*]]]]?

c. LF: Who_i does [_{CP} John believe [_{CP} [\emptyset [_{IP} Mary saw *t*_i]]]]?

If there is an empty complementizer *e* in the head of the embedded clause as in (ib), then it would be deleted as in (ic), by FI. On the other hand, if it is just an empty position, then no expletive-deletion takes place. In either case, the representation in (ib) still obtains. One other possibility is that the embedded clause in (ia) is simply an IP. Cf. section 4.6.5.

no consequences follow since these examples are grammatical: either there are no traces, as in (53) and (55), hence no problem for the ECP, or the object trace *t* is properly head-governed by the verb. There are no barriers between the *wh*-phrases and the intermediate traces, nor between the intermediate traces and the original extraction sites, as in (54) and (56). Antecedent-government of the trace in argument position does obtain.

However, this is not the case in constructions with subject extraction. Consider the ungrammatical sentences in (57a) and (58a), the well-known illustrations of the *that*-trace effect in English and the ungrammatical *que*-trace sequence in French:

- (57) a. *Who do you think that left?
 b. S-Structure: $[_{CP} \text{ Who } [_{CP} \text{ [do you think } [_{CP} \text{ [that } [_{IP} t \text{ left }]]]]]]$?
 c. LF: $[_{CP} \text{ Who}_i \text{ [do you think } [_{CP} \text{ [} \emptyset \text{ } [_{IP} t_i \text{ left }]]]]]?$
- (58) a. *Qui crois-tu que chante?
 ‘Who do you think sings?’
 b. S-structure: $[_{CP} \text{ Qui } [_{CP} \text{ [crois-tu } [_{CP} \text{ [que } [_{IP} t \text{ [chante }]]]]]]]]$?
 c. LF: $[_{CP} \text{ Qui}_i \text{ [crois-tu } [_{CP} \text{ [} \emptyset \text{ } [_{IP} t_i \text{ [chante }]]]]]?$

After deletion of *that* and *que* at LF, the LF-representations would be something like in (57c) and (58c) respectively. As in the case of the sentences in (54) and (56), there is no problem with antecedent-government of the argument trace. However, we have to ensure that the finite verbs *left* in (57) and *chante* ‘sing’ in (60) do not move to the now empty C position after deletion of the expletive, as in (59) and (60) where the finite verb *left* and *chante* move into the vacated C positions, and are in a position to head-govern the embedded subject trace in the respective examples. We would incorrectly admit these LF-representations as well-formed:

- (59) $[_{CP} \text{ Who}_i \text{ [do you think } [_{CP} \text{ [left } [_{IP} t t_i]]]]]]$
 (60) $[_{CP} \text{ Qui}_i \text{ [crois-tu } [_{CP} \text{ [chante } [_{IP} t t_i]]]]]?$

One way to achieve the blocking of a derivation like (59) and (60) is to stipulate that the rule Move- α does not operate after expletive-deletion. It would then be possible to block the derivations as in (59) and (60). However, there seem to be some empirical evidence showing that stopping the operation of the rule Move- α after expletive-deletion does not quite cover the range of facts. The evidence comes from verb second languages that allow a *that*-trace sequence, but the complementizers do not alternate morphologically.

4.5.2. Complementizer Agreement and the Verb Second Property

Complementizer agreement like West Flemish also exists in Bavarian (Bayer 1984), Frisian (Hoekstra and Marácz 1990) (cf. also some dialects of Dutch as reported in Goeman 1980):

- (61) a. I woass dassst du a Spitzbua bist.
 I know that.2SG you a rascal are
 'I know that you are a rascal.'
- b. I woass dassts ihr Spitzbuam seits.
 I know that.2PL you rascals are
 'I know that you are rascals.'
- (62) a. Hy tinkt datst do jûn komst.
 he thinks that.2SG you tonight come.2SG
 'He thinks that you are coming tonight.'
- b. Hy tinkt dat se jûn komt.
 he thinks that.3SG she tonight comes
 'He thinks that she is coming tonight.'

One noticeable common thread among them is that they are verb-second languages

that have complementary distribution of complementizers and finite verbs¹⁰. Since it would take too far afield to provide an explanation for the verb-second property, for concreteness, let us assume that there is some constraint K in these languages from which it follows that the finite verb moves to C when there is not a complementizer. We might now wonder whether complementizer agreement is related to the verb-second property in that languages with this kind of agreement must have this property.

The connection seems natural and appealing. This is because without the verb-second property, there is no independent way to move the finite verb to C to replace the expletive complementizer; as a result, all structures with agreeing complementizers would be ruled out by FI. The consequence of this is that the language would produce only ungrammatical sentences. However, there seem to be both empirical evidence and conceptual motivations for not assuming a connection between complementizer agreement and the verb-second property.

First, facts about the French *quel/qui* alternation indicates that it is not necessary for a language to have the verb-second property in order to have complementizer agreement. Although French is not verb-second; it does have some sort of (limited) complementizer agreement, namely, the *quel/qui* alternation. If it were true that languages with complementizer agreement must be verb-second, then a language like French cannot exist.

¹⁰Frisian has some exceptions. With some verbs and under certain conditions (cf. de Haan and Weerman 1986), the finite verbs may appear clause-medially with the presence of a complementizer. The sentence in (ib) is an alternative to that in (ia):

- (i) a. Ik leau dat hy him wol rêde kin.
 I think that he him save can
 'I think that he can take care of himself.'
 b. Ik leau dat hy kin him wol rêde.
 c. Ik leau [_{CP} dat [_{CP} hy [kin_i [_{IP} t him wol rêde t_j]]]]

It seems plausible that the sentence in (ib) has a double-CP structure for the complement of the matrix verb *leau* 'think' (cf. Vikner (1990)). In light of the facts in (i), the property that German, Dutch, West Flemish and Frisian share would be that an empty C position must be filled by a finite verb. This is to be contrasted with Scandinavian languages, where the absence of a complementizer does not necessarily trigger verb movement, although showing one way or the other is not a trivial matter. We will be concerned with the German/Dutch type of verb-second in the discussion that follows.

Second, recall that we have the following independently motivated principles of Universal Grammar: Move- α , FI and theory of expletive removal. If a language happens to have complementizer agreement, then with these principles in the grammar, expletive complementizers would be removed without any additional mechanism. Thus, the grammar of a language with complementizer agreement is no more complicated than one without.

4.5.3. The Lack of the *That*-trace Effect in Verb Second Languages

We have seen three of verb second languages in section 4.3.2.2, namely, Dutch, German and Icelandic, which show no morphological alternation of the complementizer, and no *that*-trace effect. The examples (29), (30) and (31) are repeated here as in (63), (64) and (65) respectively:

- (63) a. $\overbrace{\text{Wie zei je } [\text{CP} \text{ dat } [\text{IP} t \text{ die appel opgegeten heeft }]] ?}$
 who think you that the apple eaten has
 ‘Who do you think ate the apple?’
- b. $\overbrace{\text{Die man denk ik niet } [\text{CP} [\text{ dat } [\text{IP} t \text{ veel haast zal maken }]]]}$
 that man think I not that much haste will make
 ‘That man I don’t think will hurry much.’
- (64) a. $\overbrace{\text{Wer glaubst du, } [\text{CP} [\text{ dass } [\text{IP} t \text{ mich gerufen hat }]]] ?}$
 who think you that me called has
 ‘Who do you believe has called me?’
- b. $\overbrace{\text{Die Leute, die (wo) du glaubst,}}$
 the people who COMP you believe
 $\overbrace{[\text{CP} [\text{ dass } [\text{IP} t \text{ sowas getan haben könnten }]]]}$
 that this done have could
 ‘The people who you believe that could have done this’
- (65) a. $\text{petta er maðurinn}_i \text{, sem peir halda}$
 this is man-the that they think
 $[\text{CP} \text{ að } [\text{IP} t_i \text{ sé of heimskur }]] \text{ til að vinna verkeið.}$
 that is too dumb in order to do job-the
 ‘This is the man that they think is too dumb to do the job.’

- b. það er Ólafur_i, sem þeir segja [_{CP} [að [_{IP} t_i muni koma]]]
 it is Olaf that they say that would come
 'It is Olaf who they say would come.'

Again, antecedent-government is not the issue, but the issue is head-government. In order to explain the grammaticality of the sentences in (63), (64) and (65), a simple account would be to say that Dutch *dat*, German *dass* and Icelandic *að* are proper governors. With this stipulation, we need not appeal to verb movement to C to account for the grammaticality of these examples. But since we have confined the class of proper governors to all and only lexical categories (cf. section 4.3.2.2), this account is not available.

Another possibility is that Dutch *dat*, German *dass* and Icelandic *að* behave just like West Flemish complementizers in that they have ϕ -features. Therefore, they can only be replaced. With this assumption, the finite verbs must move to C to replace the feature-bearing expletive complementizers. The LF-representations would then be something like those in (66), (67) and (68) respectively in which the finite verb head-governs the embedded subject trace, the correct result:

- (66) a. [_{CP} Wie_i [zei je [_{IP} [heeft [_{IP} t_i [die appel opgegeten t]]]]]]
 ↑
 b. Die man_i, denk ik niet [_{CP} [maken [_{IP} t_i [veel haast zal t]]]]
 ↑
- (67) a. Wer_i glaubst du, [_{CP} [hat [_{IP} t_i [mich gerufen t]]]]
 ↑
 b. Wer_i glaubst du, [_{CP} [hat [_{IP} t_i [mich gerufen t]]]]
 ↑
- (68) a. Þetta er maðurinn [_{CP} O_i [sem [_{IP} þeir halda [_{CP} [sé [_{IP} t_i [t of heimskur til að vinna verkið]]]]]]]]
 ↑
 b. Það er Ólafur_j, sem þeir segja [_{CP} [koma [_{IP} t muni t_j]]]
 ↑

Although this latter possibility cannot be rejected out of hand, even though Dutch *dat*, German *dass* and Icelandic *að* do not alternate morphologically with respect to the ϕ -features of the embedded subjects, evidence for it appears to be weak. On the other

hand, if we assume that the complementizers in these languages have no ϕ -features, then they can delete. In fact, they must by FI. Again, after deletion, the finite verb may move to the vacated C positions in the respective examples. But this is impossible if we do not allow Move- α to apply after expletive-deletion.

At this point, we might consider the possibility of accounting for the parametric variations with respect to the *that*-trace sequence by having the rule Move- α operate after expletive-deletion or not. That is, for the languages that allow the *that*-trace sequence, they have the operation of the rule Move- α after expletive-deletion, and for those that do not, they lack such an operation. However, some conceptual issues immediately arise under such approach.

First, although it is subject to the subjacency condition, the rule Move- α applies quite generally and does not seem to be so constrained as to stop operating at some other points in syntax. Second, there are logically many points in the grammar where the rule Move- α could be inoperative, why is it that the partitioning of languages with respect to the *that*-trace effect cuts precisely at the point of expletive-deletion? Third, how are other differences between the two groups of languages related to this partitioning. Thus, there appears to be no strong motivation for limiting the generality of the rule Move- α in this way.

One way to get around the problem of limiting the full generality of the rule Move- α is to manipulate the point at which the ECP applies with respect to LF-operations. That is, before or after a certain LF-operation, the representation is checked against the ECP. More specifically, LF-representations are universally checked against the ECP after expletive replacement. Thus, languages with complementizer agreement must lack the *that*-trace effect.

With respect to expletive deletion, languages might differ in that there is an option of

applying the ECP before or after expletive deletion. In languages that allow the *that*-trace sequence (but lack complementizer agreement), the ECP would apply after the expletive deletion. In these languages, then, after the C position has been vacated by expletive deletion, abstract verb movement to C takes place under the rule Move- α . As a result, the embedded subject trace comes to be properly head-governed by the verb in the C position.

For languages that do not permit the *that*-trace sequence, they will have the ECP apply before expletive deletion. Since the C position has not been vacated at the point at which the ECP applies, the finite verb cannot possibly move up. Hence, when the ECP applies, the embedded subject trace still does not have a proper head-governor. The representation is thus ruled out by the ECP. After the application of the ECP, the verb is free to move up when the C position has been vacated by expletive deletion. But this is of no help. The representation has already been marked as ill-formed before the verb has a chance to move up, the correct result.

In this conception of proper government, the rule Move- α operates quite freely (subject to the subjacency condition, perhaps the only constraint on movement). In this sense, the generality of the rule Move- α is preserved. However, the major problem of this approach is that we have no principled reason why languages pick one option, rather than the other, with regard to the point where the ECP applies. Even if this might be a parameter whose value particular languages may set positively or negatively, it is not clear how this parameter is related to the rest of the grammar, nor is it obvious that the parametric difference with respect to the *that*-trace effect can be tied to other differences among grammars of particular languages.

One common conceptual problem that the various possibilities we just discussed all share is that they make no empirical prediction. Depending on what the facts are with respect to the *that*-trace effect, it would belong to one of the two logically possible

groups of languages. In the next section, I would like to propose an account in which none these problematic issues arise. More specifically, I suggest that the lack of the *that*-trace effect is closely related to some independent constraint requiring verb movement to C, the presence of the effect is a consequence of the Principle of Last Resort preventing abstract such verb movement.

4.5.4. Overt and Abstract Verb Movement to C

As is well-known, a prominent property that languages like German and Dutch have is that the finite verb is clause-medial in matrix clauses, and clause-final in embedded clause, as the following pair of German sentences illustrated:

- (69) a. Hans kaufte das Buch.
 bought the book
 ‘Hans bought the book.’
 b. Maria sagt, dass Hans das Buch kaufte.
 says that the book bought
 ‘Maria says that Hans bought the book.’

Sentences with the finite verb appearing clause-finally in main clauses, and clause-medially in embedded clauses in the presence of a complementizer are ungrammatical:

- (70) a. *Hans das Buch kaufte.
 ‘Hans bought the book.’
 b. *Maria sagt dass Hans kaufte das Buch.
 ‘Maria says that Hans bought the book.’

If we assume with Koster (1975) and den Besten (1977) that the finite verb must move to the C position, when it is not occupied by a complementizer, then the complementary distribution of the complementizer and the finite verb is accounted for. That the finite verb actually moves to the C position when it is empty is corroborated by the sentences in (71) (some speakers prefer the embedded verb be in the subjunctive Mood *sei* ‘be’ in (71)):

- (71) a. Maria glaubt, [_{CP} dass [_{IP} Hans krank ist]]
 thinks that sick is
 ‘Maria thinks that Hans is krank.’
 b. Maria glaubt, [_{CP} Hans [ist [_{IP} t krank t]]]
 c. *Maria glaubt, [_{CP} [_{IP} Hans krank ist]]

Some verbs like *glauben* ‘think’ allows their complements to have main clause word order (cf. Holmberg (1986) and Vikner (1990) for similar facts in Scandinavian languages), but only if the complementizer is absent

In Icelandic, however, it is not obvious that the finite verb moves to C main clauses, since it also appears clause-medially in embedded clauses with a complementizer:

- (72) a. Jón las aldrei bókina.
 Jon read never books
 ‘Jón never read books.’
 b. María segir að Jón las aldrei bókina
 said read never books
 ‘Maria said that Jón never read books’

However, Icelandic is a language in which the finite verb must be in the second position

not only in main clauses, but also in embedded clauses¹¹:

- (73) a. María segir að bókina las Jón aldrei.
 said books read never
 ‘Maria said that books, Jón never read’
 b. *María segir að bókina Jón las aldrei.

Depending on the assumptions about Icelandic clause structure and Case theory, a main clause like that in (72a) or an embedded clause like that in (72b) may or may not be a CP. Within the set of assumptions that we are adopting here, the examples in (72) are consistent with IP or CP being the projection of these clauses (the structures are of course compatible with the VP-internal Subject Hypothesis. They are being simplified here.):

- (74) a. [_{IP} Jón [las [_{VP} aldrei [_{VP} t bókina]]]]
- b. María segir [_{CP} að [_{IP} Jón [las [_{VP} aldrei [_{VP} t t bókina]]]]]]
- (75) a. [_{CP} Jón [las [_{IP} t [t [_{VP} aldrei [t bókina]]]]]]]]

¹¹There are some exceptions to this generalization. In embedded questions, the finite verb is not in the second position (Thráisson (1986)):

- (i) Ég veit ekki hvern María hefur kysst.
 I know not who has kissed
 ‘I don’t know who Mariam kissed.’

Some adverbials like *loksins* ‘finally’, *enfaldlega* ‘simply’ and *bara* ‘simply’ may intervene between the subject and the finite verb (Maling (1980), Thráisson (1986)):

- (ii) a. Pagar ég loksins fann lagið.
 when I finally found tune
 ‘When I finally found the tune.’
 b. Hann einfaldlega kann ekkert.
 he simply knows nothing
 ‘He simply knows nothing.’
 c. Ég bara veit ekkert um það.
 I just know nothing about it
 ‘I just know nothing about it.’

The fact that the finite verb in (i) appears in the third position is not necessarily a counter-example to the constraint, from which the finite verb must be in the second position in main clauses. The issue is the exact position where the finite verb is, not the apparent linear order. Yiddish has the same distribution of the finite verbs as in Icelandic.

b. María segir [_{CP} að [_{CP} Jón [las [_{IP} t [t [_{VP} aldrei [_{VP} t bókina]]]]]]]]]

However, the structure of (73a) must be a CP as in (76a), not an IP as in (76b) with the subject stays in its base-position (Rögnavaldsson and Thráisson (1990)):

(76) a. María segir [_{CP} að [_{CP} bókina [las [_{IP} Jón [t [_{VP} aldrei [_{VP} t t]]]]]]]]]

b. María segir [_{CP} að [_{IP} bókina [las [_{VP} Jón [_{VP} aldrei [_{VP} t t]]]]]]]

The reason why the example in (73a) must have the structure as in (76b) is that because of our assumption that [SPEC, IP] is a position to which subjects move for Case-checking. If some other elements moved there, then the subject would have no way to be Case-checked. As a result, the subject would not be visible for θ -role assignment, and ultimately a representation like that in (76b) would violate FI. The point relevant to your discussion of the verb movement in German and Dutch is that the CP-complement to the complementizer *að* ‘that’ in (76a) must have an empty position for the finite verb to move in. In this respect, Icelandic is like German and Dutch in that the finite verb must move to the C position when it is not occupied by a complementizer¹².

A variety of reasons have been offered to explain syntactic verb movement to C in German and Dutch (cf. Kayne (1982), Holmberg (1983), Platzack (1983, 1986a, 1986b), Koopman (1984), Travis (1984), Safir (1985), Weerman (1989) among many others). Since it would be outside the scope of this dissertation to provide an explanation for the syntactic verb movement to C of this sort, for concreteness, let us assume that there is some constraint K, from which it follows that the finite verb must move to the C position when it is not occupied by a complementizer.

In embedded clauses with a complementizer, the finite verb is thus prevented from

¹²As we mentioned in footnote 10, some apparent cases of a clause-medial finite verb in the presence of an overt complementizers plausibly have a double-CP structure. If that is correct, then Frisian is just like German, Dutch, Icelandic, and West Flemish in that the finite verb must move to the unoccupied C position.

moving into the C position at S-structure. As a result, the constraint **K** is not satisfied at S-structure. Suppose we have a stronger constraint **K**, however, in that it must be satisfied at LF, if it has not already been satisfied at S-structure. This stronger constraint would then require verb movement to C, provided the C position is vacated.

It seems reasonable to assume that the absence of overt morphological agreement indicates the absence of ϕ -features. Given that expletive complementizers like Dutch *dat* or German *dass* have no ϕ -features (they have no morphological alternations), they can delete at LF. In fact, they must delete according to FI. After deletion, the constraint **K** requires that the finite verb move to the vacated C position, from which it properly head-governs the embedded subject position. As the Frisian German and Icelandic examples would receive the same derivation, we will illustrate here how the embedded subject trace is properly head-governed in (77) for the Dutch examples in (65):

- (77) a. S-Structure: $\overline{\text{Wie}}_j \text{ zei je } [_{\text{CP}} \text{ dat } [\text{ }_t [_{\text{IP}} \text{ die appel opgegeten } t] \text{ heeft+I }]]$
- b. LF-deletion: $\text{Wie}_j \text{ zei je } [_{\text{CP}} \emptyset [_{\text{IP}} t_j \text{ die appel opgeten heeft+I }]]$
- c. Verb-second property requires verb movement to C:
 $\text{Wie}_j \text{ zei je } [_{\text{CP}} [\text{heeft+I}]_k [_{\text{IP}} t_j \text{ die appel opgeten } t_k]]$

As in West Flemish, the finite verb in German, Dutch, Icelandic and Frisian ends up in a C position at LF, the lack of the *that*-trace effect is accounted for. A very natural consequence now follows from the constraint **K**. In languages with this constraint, finite verbs uniformly end up in a C position at LF, in both embedded clauses and main clauses.

The empirical prediction under this view is that languages that have the verb-second property must lack the *that*-trace effect. In those languages that do not have this property, the *that*-trace effect must show up in constructions without no complementizer agreement. English is a typical example of of the latter group of languages, as we show

in the next section. It is important to bear in mind that a necessary consequence of the expletive replacement analysis of complementizer agreement is that a language must allow a *that*-trace sequence in constructions with complementizer agreement, even if it does not have the verb-second property. French is one such language, as we have seen.

4.5.5. The *that*-trace effect and the Principle of Last Resort

Let us now return to languages like English in which the *that*-trace shows up. Recall that our assumption that expletive complementizers like English *that* must delete, by FI. The question that we raised was that after the deletion of the expletive, what stops the verb from moving to the vacated C position:

- (78) a. S-structure: $[_{CP} \text{Who} [_{IP} \text{do you think } [_{CP} [\text{that } [_{IP} t \text{ left }]]]]]?$
 b. LF expletive deletion:
 $[_{CP} \text{Who}_i [_{IP} \text{do you think } [_{CP} [\emptyset [_{IP} t_i \text{ left }]]]]]?$
 c. LF abstract verb movement:
 $[_{CP} \text{Who}_i [_{IP} \text{do you think } [_{CP} [\text{left } [_{IP} t_i t]]]]]?$
-

We would, incorrectly, admit the LF-representation in (78) as well-formed, abstract verb movement takes place as indicated.

Notice first that the constraint K is not observed in English, the verb would not end up in a C position because of the absence of the constraint. However, this does not seem to be sufficient. We need a general principle that actually prevents the verb from moving to C. I would like to suggest that the Principle of Last Resort and theory about legitimate LF-objects (Cf. section 1.8) would disallow verb movement to C in languages like English.

Compare the example in (78) showing an ungrammatical *that*-trace sequence, and the sentence in (79):

- (79) a. S-structure: You think $[_{CP} \text{that } [_{IP} \text{John left }]]$
 b. LF deletion: You think $[_{CP} \emptyset [_{IP} \text{John left }]]$

c. No LF abstract verb movement: You think [_{CP} ∅ [_{IP} John left]]

The complementizer *that* must delete at LF by FI in both (78) and (79). The LF-representation in (78b) differs minimally from that in (79b) in that it has an LF-object operator-variable chain (*who_i, t_i*). However, according to clause (e) of the list of legitimate LF_objects in section 1.8, the chain is a legitimate LF-object. As far as LF-objects are concerned, the representation in (78b), just as that in (79b), has no impermissible objects at LF. Therefore, just as no movement is allowed in the representation in (79b), by the Principle of Last Resort. In other words, the LF-representation (78b), but not that in (78c), would obtain for the S-structure in (78a). We would thus correctly predict that the example is ill-formed.

4.6. Consequences of the Conjunctive ECP

In this section, we will look at some consequences of the conjunctive formulation of proper government. We will see that although it adequately accounts for quite a number of facts in a natural way, there are still some constructions that raise non-trivial problems for the conjunctive ECP. We will see that it can explain facts about extraction of arguments and adjuncts out of *wh*-islands, long-distance movement of subjects, and that we must assume a functional projection AGRP of Chomsky (1989), without which the distinction between objects and adjuncts is lost in the conjunctive formulation of proper government. We will also discuss cases of long-distance movement out of an embedded clause without an overt complementizer, where we will see that if we are to refrain from positing abstract C°'s acting as proper governors for the subject trace, then an account for these cases has some repercussions elsewhere in the grammar.

4.6.1. Extraction out of *Wh*-islands in West Flemish

The complementizer *ofda* ‘whether’ in West Flemish also shows agreement with the embedded subject. The agreement of *ofda* is given in (80):

- (80) a. K weten nie ofdan-k/*da-se (k) keunen kommen
I know not whether.1SG.PRON/whether.3SG.PRON.FEM I can come
‘I don’t know whether I can come.’
- b. K weten nie ofda-se/*ofdan-k (jij) keu kommen
I know not whether.3SG.PRON/*whether.1SG.PRON.FEM she can come
‘I don’t know whether she can come.’
- c. K weten nie ofdan-ze/ofda-se (zunder) keunen kommen
I know not whether.3PL.PRON/*whether.3SG.PRON.FEM they can come
‘I don’t know whether they can come.’

At first glance, it looks like a problem. We cannot replace this complementizer, which has significant semantic content, namely, it heads a CP which denotes an indirect interrogative. Furthermore, extractions out of *ofda*-clauses are impossible, just like out of *whether*-clauses in English (notice that there is still agreement between *wien* ‘who’ and *ofda* in (81b)):

- (81) a. K weten ofda/*ofda-se Jan Marie goan vroagen
I know whether.3SG.MASC/*whether.3SG.PRON.FEM go ask
‘I know whether Jan goes ask Marie.’
- b. *Den vent da-j gie weet ofda t Marie goat vroagen
‘The man that you know whether he go ask Marie’

Suppose *ofda* is not a single-morphed complementizer, but is composed of two morphemes. One is some element *of* and the other is the complementizer *da* that we have seen in many examples¹³. Crucially, *of* is in the Spec of *da*, as in (82):

¹³In a different context, Déprez (1990) attributes this possibility to David Pesetsky.

The idea that antecedent-government is crucial for proper government is further supported by judgments on extraction out of *whether*-clause in English. Sobin (1985) reports that although there are some speakers allow the *that*-trace sequence¹⁴, the *whether*-trace sequence is almost universally found to be unacceptable. The judgments on this divergent acceptability are very sharp. Suppose the S-structure of a sentence with an embedded *whether*-clause like that in (87a) is as in (87b)¹⁵:

- (87) a. *Who did you wonder whether left?
 b. *Who did you wonder [_{CP} whether [_{C'} Φ [_{IP} *t* left]]]
-

where the embedded CP is headed by a phonetically null complementizer Φ and *whether* is in the Spec of Φ . The virtually universal rejection of *whether*-trace sequence can be straightforwardly accounted for in my analysis just like in the case of extraction out of *ofdat*-clause in West Flemish.

In (87b), the presence of *whether* prevents the *wh*-phrase *who* from making a transition in the Spec of the embedded CP, which in turn becomes a barrier for the trace *t* since it inherits the barrierhood from a non-L-marked IP dominating the trace. Antecedent-government thus fails, exactly like the case of West Flemish discussed above for the LF-representations (84) and (86c).

¹⁴If these dialects are otherwise identical to those that disallow the *that*-trace sequence, then we do not seem to have a better explanation than to say that head-government is a less severe violation of the ECP than antecedent-government. It is very likely that there are other differences between the dialects. Only through a careful study of these dialects would reveal insights into the underlying differences. The same remarks apply to the difference between Standard Swedish (which disallows the *that*-trace sequence) and Finland Swedish (Engdahl (1985)).

¹⁵Kayne (1990) points out the grammatical contrast a pair of sentences like that in (i) and argues for *whether* being in [Spec,CP] and *if* is a C°:

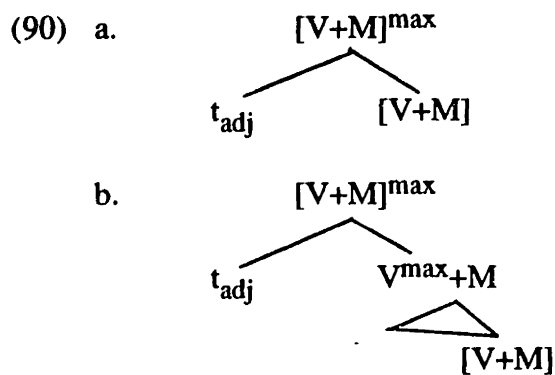
- (i) a. ?John wondered whether to leave.
 b. *John wondered if to leave

4.6.2. Adjunct Extraction in Vata

Some data about adjunct extraction in Vata can apparently be accommodated within the conjunctive formulation of proper government. According to Koopman and Sportiche (1986), short-distance extraction of adjuncts is possible, but long-distance extraction out of *wh*-islands are impossible (notice that there is adjunct morphology on the verb in the examples in (88), cf. section 3.5.3. REL is a marker that the clause is a relative clause):

- (88) a. yĚsÓ`n̄ dĪdÒdĪdÒ sūŌ lá
 how you cut-M-cut-M tree-DET WH
 ‘How did you cut the tree?’
 b. yĚsÓ`n̄ dĪĪÈ sūŌ lá
 how you cut-M tree-DET WH
 ‘How come/why did you cut the tree?’
- (89) a. *yĚsÓ`n̄ ylá nyni [zĒ`n̄ dĪdÒdĪdÒ-ŃŌ [e]] lá
 how you wonder thing you cut-M REL WH
 ‘How do you wonder what you cut?’
 b. *yĚsÓ`n̄ nĪ [zĒ`Ō ká -ŃŌ [e] dĪdÒ]
 why you NEG-A thing he FUT-A] REL cut-M
 ‘Why don’t you know what he cut?’

They argue that the trace of the extracted adjunct is lexically governed (in our terms, properly head-governed) by the adjunct morphology in the structure in (90a), or that in (90b) where V is the head of the theta projection V^{\max} and M the head of the projection of [V+M]:



Since the examples in (89) are ungrammatical, it must be that lexical government is not sufficient.

However, facts about extraction in Vata appear to be problematic. According to Koopman (1984), subject extraction must use a resumptive pronoun, even if there is no *wh*-island intervening between the antecedent and the trace. She claims that *wh*-phrases move to the left of the clause, and COMP (= [SPEC, CP] is to the right); hence, the extracted *wh*-phrase, not being in COMP, cannot antecedent-govern its trace. A resumptive pronoun thus must be used. Koopman and Sportiche (1986) propose the condition in (91) to constrain extraction out of *wh*-islands¹⁶:

(91) **Condition on Long Extraction**

x is a possible long extraction site iff *x* is a theta-position.

Now, if [SPEC, IP] is a θ' -position, then it would follow from (91) that subject extraction out of *wh*-islands is impossible in languages like English, French and Vata. One problem is that there is no adjunct morphology on the verb with extraction of PPs. What this means is that PPs must be antecedent-governed. But PP *wh*-phrases also move to the left of the clause, just like subjects. If *wh*-phrases in subject extraction cannot antecedent-govern their traces because they are not in COMP, then there should also be no antecedent-government of PP-traces, contrary to fact (cf. section 3.5.3. *gbU* in (92) is a postposition):

- (92) $y\bar{I}$ $gb\bar{U}$ \bar{n} ka $s\bar{u}\bar{O}$ $d\bar{I}$
 what reason you FUT-A tree-DET cut
 ‘Why are you going to cut the tree?’

Another problem is that in long-distance subject extraction out of a *wh*-island, the

¹⁶The implicit assumption here appears to be that “long extraction” in (91) means extraction out of a *wh*-island. Otherwise, long-distance extraction out of non-*wh*-island, which is possible for non-subjects in Vata, would be incorrectly disallowed.

presence of a resumptive pronoun does not improve grammaticality (R is for resumptive, NA is a marker of subordination):

- (93) a. àlÓ Ò/*[e] nÙ mÍ la
 who he-R did it WH
 'Who did it?'
 b. àlÓ ò gùgù na Ò/*[e] nÙ mÍ lá
 who you thought NA he-R did it WH
 'Who did you think did it?'
- (94) *àlÓ ò nÍ [zĒ mĒmĒ gbÚ Ò dÍ -bÒ mÉ] yì lá
 who you NEG-A reason it-it for he-R cut REL it know WH
 'Who don't you know why cut it?'

It is not clear why the resumptive pronoun in (94) does not save the structure from an ECP violation the way it does in (93). One conceptual problem is why the government relationship between a governor and a trace depends on whether or not there is a *wh*-island intervening between the antecedent and the trace. Therefore, it must be said that it is very unclear what additional assumptions are necessary in order to accommodate all the Vata facts presented here.

Putting aside some intricate issues raised by the structure of the verbal projection involving adjunct morphology, particularly with respect to X'-theory, let us accept Koopman and Sportiche's claim that traces of (non-PP) adjuncts are lexically governed by the verb and adjunct morphology complex. However, within the conjunctive formulation of proper government, antecedent-government is also required for proper government. The ungrammaticality of the examples in (89) now follows straightforwardly from the lack of antecedent-government of the adjunct traces. Thus, we need not make the assumption that the condition in (91) holds.

4.6.3. Long-distance Dependency in Welsh

Sproat (1985) claims that the subject position in Welsh is not properly governed, a conclusion that is inconsistent with the assumption that the verb moves to C¹⁷. The grammatical contrast in the pair of examples in (94) is supposedly parallel to the pair of English sentences in (95) (due to Kayne (1983)) in that properly governed empty categories must be contained in clauses that are themselves properly governed. (Notice that there is no resumptive pronoun in (94b). We return to this dialectal variations below):

- (94) a. *Dyma'r llyfrau [_{S'} O_i [_S a brynasant hwy [e]_j
 here the books prt bought.3PL they
 [_{S'} heb wybod [_S os byddai [_S darllen [e]_i] yn syniad da]]]]
 without know whether would-be read (subject position) prt idea good
 'Here are the books which they bought without knowing whether reading
 would be a good idea.'
- b. ?Dyma'r llyfrau [_{S'} O_i [_S a brynasant hwy [e]_i
 here the books prt bought.3PL they
 [_{S'} heb wybod [_S os byddai rhaid iddynt [_{S'} darllen [e]_i]]]]]
 without know whether would-be necessity to-them read (object position)
 'Here are the books which they bought without knowing whether
 it would be necessary for them to read.'
- (95) a. *Here are the books [which [they bought e_i
 [without knowing whether [reading e_i] would be a good idea]]]
 b. ?Here are the books [which [they bought e_i
 [without knowing whether it would be necessary for them [to read e_i]]]

¹⁷If we adopt the definition of government as in (i), from Stowell (1981), then the subject position is not properly governed by the verb when it is fronted to the left of the subject (Sproat (1985)):

- (i) In the configuration [_γ ... β ... α ...], α governs β where:
 (a) α = X⁰, and γ = Xⁿ (i.e. γ is an X'-projection of α) and
 (b) for each maximal projection δ, δ ≠ α, if δ dominates β,
 then δ also dominates α.

The problem with the definition in (i) is that a head would never govern its own trace when it undergoes head-to-head movement:

- (ii) [_{CP} What [did [_{IP} Johh [t [_{VP} see t]]]]]

The difference between the a-examples and the b-examples is that the empty categories in the former are in the subject position, a non-properly governed position, and those in the latter are in the object position, a properly governed position.

However, it is not clear if the ungrammaticality of the example in (94a) is due to the subject trace not being properly governed, or because of the grammar of Welsh does not allow sentential subjects:

- (96) a. Mae'n amlwg [bod Mair wedi dod yn ôl]
 is prt obvious be prt come back
 'It is obvious that Mair has come back.'
 b. *Mae [bod Mair wedi dod yn ôl] yn amlwg.
 is prt come back prt obvious
 'That Mair has come back is obvious.'

According to Jones and Thomas (1977:222), sentential subjects always extrapose:

- (97) a. Mae'n poeni John [bod Mair wedi dod yn ôl]
 is prt worry be prt come back
 'It worries John that Mair has come back.'
 b. *Mae [bod Mair wedi dod yn ôl] yn poeni John
 is prt prt come back prt worries
 'That Mair has come back worries John.'

I would now like to argue nonetheless that there is some indirect evidence showing that the subject position is not properly governed, a necessary consequence if the verb does not move to C as I suggested in section 2.4.1. This is one advantage for theory of proper government alluded to earlier of positing an IP-structure for Welsh declaratives, and a complementizer occupying the C position in interrogatives blocking verb movement. However, since Welsh allows null subjects, we thus need some way to tell when the null subject is an instance of a trace, and when an instance of a phonetically null pronominal *pro*.

The agreement patterns in Welsh are quite peculiar. There is full (Number, Person) agreement with pronominal subjects, but non-pronominal subjects always occur with a verb in third Person singular (Harlow (1981)):

(98)	darllena i s (i)	darllenasom (ni)
	read.1SG I	read.1PL we
	darllena i st (ti)	darllenasoch (chwi)
	read.2SG you	read.2PL you
	darlleno d d (hi/ef)	darllenasant (hwy)
	read.3SG she/he	read.3PL they

- (99) a. Darllenodd y dyn y llyfr.
 read.3SG the man the book
 'The man read the book.'
- b. Darllenodd y dynion y llyfr
 read.3SG the men the book
 'The men read the book.'

As indicated in the examples in (98), the pronominal subjects can be phonetically null. By the Projection Principle, the subject position must be occupied by a null pronoun (i.e. *pro*), rather than simply being empty. A representation for an example like that in (100a) with null subjects would be something like (100b):

- (100) a. Darllenasoch y llyfr
 read.2PL the book
 'You read the book.'
- b. [_{IP} Darllenasoch [_{VP} *pro* [_t y llyfr]]]
-

There is one complication, however. If the extracted subject is third Person, singular, we cannot be absolutely certain that the subject position is occupied by a *pro* or a trace. That is, an example like that in (101a) is compatible with both the representations in (101b) and (101c):

- (101) a. Pa ddyn darllenodd y llyfr?
 which man read.3SG the book
 'Which man read the book?'

- b. [_{CP} Pa ddyn [a [_{IP} [darllenodd [_{VP} *pro* [*t* y llyfr]]]]]]
- c. [_{CP} Pa ddyn [a [_{IP} *t* [darllenodd [_{VP} *t* [*t* y llyfr]]]]]]
-

As we see in section 2.4.2.1, structures of the sort in (101b) involving long-dependencies are possible in Welsh. Nonetheless, if the verb has Number, Person agreement features other than third Person singular, then it must be the case that the subject position is occupied by a *pro*.

Consider now the case where the extracted subject is third Person plural. Just as we expect, there is no agreement with non-pronominal subjects:

- (102) [_{CP} Pa ddynion [a [_{IP} *t* [darllenodd [_{VP} *t* [*t* y llyfr]]]]]]
- which men prt read.3SG the book
- ‘Which men read the book?’
-

Since the non-pronominal subject in (102) starts out in [SPEC, IP], and subject-verb agreement is established through Spec-head agreement, the lack of agreement falls out naturally from the assumption that the subject has moved from [SPEC, IP] to [SPEC, CP].

When there is some sort of long-distance dependency spanning over two clauses, as in (103), the verb in the lower clause has Number, Person agreement:

- (103) Pa ddynion y dywedodd Siôn y darlhenasant/*darllenodd y llyfr?
- which men prt said prt read.3PL/*read.3SG the book
- ‘Which men did Siôn say read the book?’

By the conclusion we reached in connection with the examples in (100), there must be a *pro* in [SPEC, IP]. The structure of the example (103) must then be something like (104), a structure in which there is no movement involved:

- (104) [_{CP} Pa ddynion [y [_{IP} dywedodd [_{VP} Siôn [*t*]]]]]
-

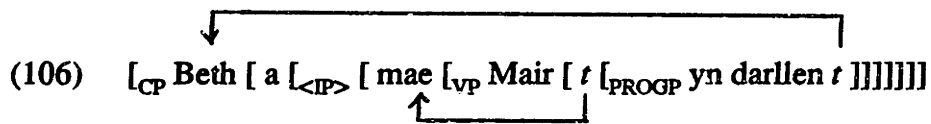
[_{CP} y [darllenasant [_{VP} *pro* [t y llyfr]]]]]]]]]
↑

Given our discussion of long-distance dependency involving an object in section 2.4.2.1, which was argued not to involve movement, it is not at all surprising that the same is true of long-distant dependency involving a subject. In a theory of bounding with two parameters, the fact that there is no long-distant extraction follows from the settings [+lexical bounding] [+functional bounding], which make both CP and IP (among others) bounding, movement of the subject from the embedded clauses in (103) would cross two bounding barriers, violating subjacency.

According to Jones and Thomas (1977), some dialects of spoken Welsh allow the possibility of dropping the resumptive pronouns in object positions. Alongside with the example in (105b) with a resumptive pronoun in the formal register, the examples in (105c) and (105d) without a resumptive pronoun are also possible (the particle *y* is usually dropped in colloquial Welsh):

- (105) a. Mae Mair yn golchi 'r car
 is prt wash the car
 'Mair is washing the car.'
 b. Beth y mae Mair yn ei olchi?
 what prt is prt it wash
 'What is Mair washing?'
 c. Beth y mae Mair yn olchi
 'What is Mair washing?'
 d. Beth a mae Mair yn golchi
 'What is Mair washing?'

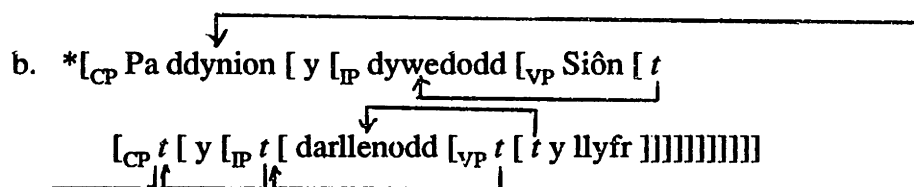
Some speakers retain the mutation caused by the object clitic, as in (105c), some others do not. One explanation for the possibility of dropping the object clitics is that these dialects are like English in having the parameter [-lexical bounding], which makes PROGP non-bounding (modulo some problems with PROGP, cf. section 2.4.2.4). Suppose the structure for the example in (105d) A derivation for the example in (105c) would be something like (106):



Movement of the object to [SPEC, CP] thus observes subjacency. The difference between the dialects that do not permit dropping of the resumptive pronouns and those that do is reduced to the different value of the same parameter. That is, with the parameter [-lexical bounding], dialects that allow dropping of the object resumptive pronoun have operator movement to [SPEC, CP] without violating subjacency. Those dialects that do not allow dropping of the object resumptive pronoun have the parameter [+lexical bounding], operator movement would incur a subjacency violation.

However, no dialects have been reported to allow the example in (107a), which involves long-distant movement of the subject from the embedded clause, as in (107b):

- (107) a. *Pa ddynion y dywedodd Siôn y darllenodd y llyfr?
 which men prt said prt read.3SG the book
 ‘Which men did Siôn say read the book?’





The singular Number feature on the verb of the embedded clause would be as expected if the extracted subject passes through the Spec of the embedded IP, the position where Spec-head agreement obtains (cf. (102)). Its ungrammaticality thus shows that it is not possible to extract the embedded subject. This is surprising from the point of view of the dialects that allow long-distant extraction of objects (cf. (105c) and (105d)). Since the position where the subject starts out is higher than that of the object, long-distance extraction of subjects should be possible in these dialects that allow long-distance object extraction. There seems to be no issue with respect to subjacency. An ECP account seems plausible.


Recall our assumption about clause structure in Welsh is that the verb does not move to C (cf. section 2.4.1). In the structure in (107b), antecedent-government of the trace in the Spec of the embedded IP obtains, but head-government fails. It is not governed by a proper head-governor. The verb in INFL does not c-command it. The disjunctive formulation of proper government incorrectly admits the representation as well-formed. In the structure in (107), the embedded subject trace lacks a proper head-governor, however. It seems that the conjunctive formulation of proper government, which requires both antecedent-government and head-government to satisfy the ECP, makes the correct prediction.

4.6.4. Argument/non-argument Distinction

One consequence for the conjunctive ECP for adjunct extraction is that adjuncts are always head-governed. Consider some simple cases of adjunct extraction in (108):

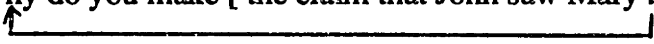
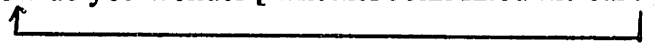
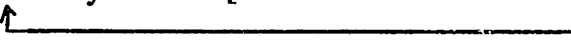
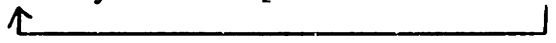
- (108) a. Why do you think [that John saw Mary *t*]

 b. How do you think [that John fixed the car *t*]


Since the examples are grammatical, it must be that the adjunct traces are properly head-governed. Rizzi (1990a) suggests the configuration in (109a), where Reason adverbials are adjuncts to TP and Manner adverbials are adjuncts to VP:

- (109) a. [_{IP} I° [_{TP} [_{TP} T° [_{VP} [_{VP} V°] Manner-Adv]] Reason-Adv]]
 b. [_{IP} [_I° I° [_T° T° V°]] [_{TP} [_{TP} *t* [_{VP} [_{VP} *t*] Manner-Adv]] Reason-Adv]]


Since verbs, Tense and INFL merge at some point, the verb would end up in INFL at LF, where the complex I°+T°+V° would govern the TP-adjoined position, and the trace of the T°+V° complex in T would also govern the VP-adjoined position. Thus, head-government of adjunct traces would always obtain, and would thus be unproblematic.

Consider now adjunct extraction out of islands. The examples in (110) are ungrammatical with the construal of adjuncts with the lower clause:

- (110) a. *Why do you make [the claim that John saw Mary *t*]

 b. *How do you wonder [whether John fixed the car *t*]

- (111) a. ?Who do you make [the claim that John saw *t*]

 b. ?What do you wonder [whether John fixed *t*]


The extraction in the examples in (110) and (111) both violate subadjacency. However, since there is a grammatical contrast, it must be that something else is involved. Let us consider the status of the traces with respect to the ECP. If adjuncts in their base-positions are always properly head-governed, just like objects, then there must be a difference with respect to antecedent-government, given the mild ungrammaticality of extraction of objects out of islands. A reasonable conjecture would be that objects are always antecedent-governed, but not adjuncts.

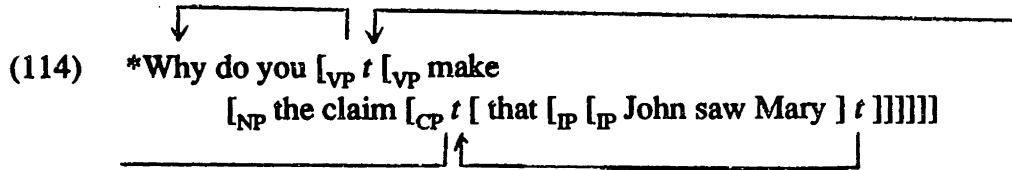
Suppose phrase structures involving a transitive verb include a functional projection AGRP, as suggested in Chomsky (1988), then the grammatical difference between the examples in (110) and those in (111) can be accounted for. In the structures for the examples in (111) given in (112), the object trace can be γ -marked by its antecedent when it moves to the [SPEC, AGRP]¹⁸:

¹⁸There are some technical details about γ -marking that need to be worked out here. Lasnik and Saito (1984) define γ -marking as in (i) (lexical government is head-government by a lexical head) and a filter in (ii), which are for them a two-part formulation of the ECP:

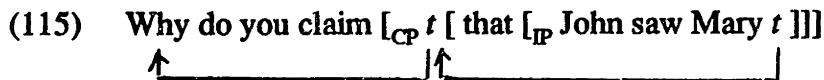
- (i) a. $t \rightarrow [+ \gamma]$ when lexically governed or antecedent-governed.
 b. $t \rightarrow [- \gamma]$ otherwise.
- (ii) * ... t ...
 [- γ]

Since the *that*-trace effect is the result of failure of head-government, we must assume that a subject trace cannot be marked [+ γ] by antecedent-government.

The solution given to the structure (113a) with the complement to the verb matrix a DP is an improvement over that suggested in Chomsky (1986b), which assume NPs for nominal projections. Consider the structure in (114) with an NP as the complement to the matrix verb:



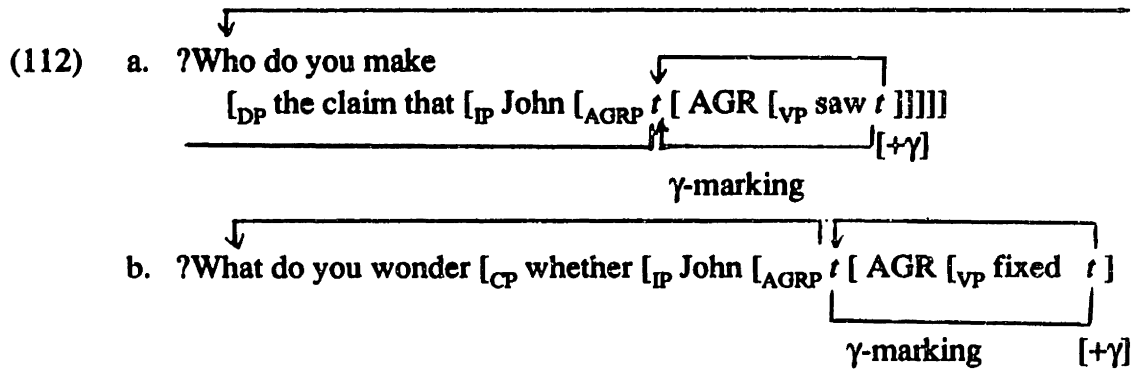
That the initial trace is not the offending trace can be seen from the grammaticality of the example in (115):



According to Chomsky's (1986b) framework, the trace in the [SPEC, CP] in (114) is the offending trace since the noun *claim* assigns an oblique case to its CP-complement, which imposes an inherent barrier to government.

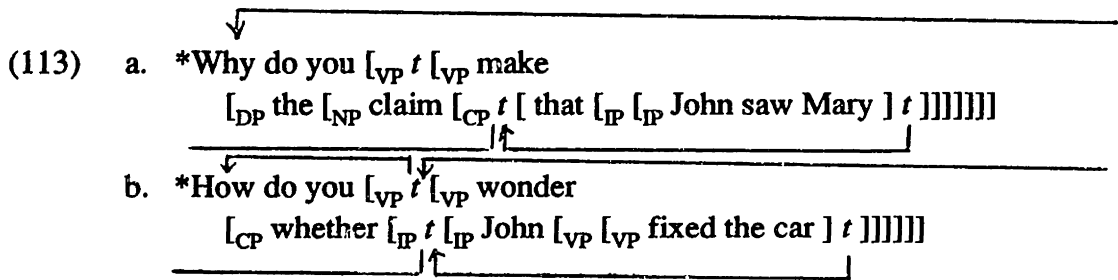
However, to the extent that N°s are lexical categories, and specifically those that are derived from verbs, it seems quite natural that N°s can L-mark their complements just like their verbal counterparts can. Thus, the N° *claim* in the structure in (113a) would L-mark its CP complement and properly head-govern the trace in [SPEC, CP]. But this would have no undesirable consequences for the theory of conjunctive ECP. Antecedent-government of this trace still fails, as discussed.

That in general N°s may L-mark their complements, and can properly head-govern the trace in the Spec position of the complements does not give incorrect results. One other case bearing on this point is Raising in nominals. It has long been noticed that while Raising is possible in constructions like that in (116), Raising in nominals as in (117) is impossible:



Intermediate traces after the movement to the [SPEC, AGRP] can then delete.

However, as Lasnik and Saito (1984, 1989) show, even when the initial trace of the adjunct can be γ -marked inside a *wh*-island, some other intermediate trace would fail to be γ -marked since antecedent-government is impossible across an island. Suppose the structures for the examples in (111a) and (111b) are as in (113a) and (113b) respectively:



In these structures, the adjunct can only be adjoined to the matrix VP in accord with the structure-preserving constraint on movement (cf. section 2.4).

In (113a) the initial trace of the adjunct can be γ -marked by the trace in [SPEC, CP], but the latter trace itself would not be γ -marked by the trace that is adjoined to the matrix VP. Antecedent-government fails here because the DP is a barrier to antecedent-government. It inherits the barrierhood of the non-L-marked NP, even though the DP itself is L-marked. In (113b), the initial trace of the adjunct can again be γ -marked by its antecedent, the IP-adjoined trace. But the latter trace cannot be antecedent-governed by the trace that is adjoined to the matrix VP, because of the intervening CP barrier. The CP dominates an IP, which is a BC, and hence is a barrier by inheritance. The IP-adjoined trace thus cannot be γ -marked.

- (116) a. It is likely [that John will win the race]
 b. John is likely [*t* to win the race]
 ↑
 (117) a. The likelihood that John will win the race
 b. *[John's likelihood [*t* to win the race]]
 ↑

Clearly, we must have government of the subject trace in (116b), since the sentence is grammatical; and this is possible only if the adjective *likely* can L-mark its complement. Now, if L-marking by nominals is also assumed, then an ECP account for the ungrammaticality of the example in (117b) would not be possible.

In fact, we need not have an ECP account for the example in (117b), which can be ruled out independently by the Uniformity Condition (section 1.5.5). In this structure, the chain (*John*, *t*) is not θ -marked by the adjective *likely*, hence it cannot be assigned inherent Case, of which Genitive case is an instance.

4.6.5. Long-distance Subject Extraction in English

In the previous discussions of the consequences of the conjunctive ECP, we see that it can explain an array of data in a variety of languages in a very simple way. However, as we will see in this section, there are some facts about long-distance subject extraction in English that seem to present some serious problems for it, solutions to which have repercussions elsewhere in the grammar.

The English examples in (118)-(120) immediately raise the question of how the subject trace is properly governed, if there actually is movement involved, and the structures are as indicated:

- (118) [_{CP} Who [[_{IP} *t* left]]
 ↑
 (119) [_{CP} Who [do [_{IP} you think [*t* left]]]]]
 ↑
 (120) John wondered [_{CP} who [_{IP} *t* left]]
 ↑

For ease of reference, let us call cases of extraction to the local [SPEC, CP] like (118) and (120) as *short subject questions*, and those like that in (119) as *long subject questions*. We defer the discussion of short subject questions until section 5.7, and consider long subject questions in this section.

It is not obvious that the subject trace in the examples above has a head-governor. This issue is not of primary concern in the disjunctive ECP, since the subject trace can be antecedent-governed by the *wh*-phrase in [SPEC, CP]. But the matter is much less straightforward for the conjunctive ECP. Rizzi (1990a) suggests that contrary to appearance, there is an abstract complementizer in the C positions in the examples in (118)-(120), which can be turned into a proper head-governor by Spec-head agreement when the *wh*-phrase moves through its Spec position. On this view, then, the structure of these examples would be something like (121)-(123), where the co-indexing between a C° and an element in its Spec is obtained by Spec-head agreement:

(121) [CP Who_i [C°_i [IP t_i left]]

(122) [CP Who_i [do [IP you think [CP t_i [C_i [IP t_i left]]]]]]

(123) John wondered [CP who_i [C°_i [IP t_i left]]]

This possibility of course can not be rejected out of hand, but independent motivation for the existence of such abstract complementizers does not appear to be very strong. Specifically, it is not at all very clear why an abstract C° may be turned into a proper head-governor, but its overt counterpart *that* may not. Compare the structure in (122) and that in (124):

(124) *[CP Who_i [do [IP you think [CP t_i [that [IP t_i left]]]]]]

They differ in exactly one respect, namely, an phonetically null complementizer in the former, but an overt one in the latter. Given that the overt complementizer *that* also bears

a Spec-head relation with the trace in its Spec, just like the case with the abstract complementizer C° and the trace in its Spec, it is not at all clear why Spec-head agreement obtains in (122), but not in (124). We of course can make the assumption that the abstract C° is an instance of AGR, but the overt complementizer *that* is not. Nonetheless, without independent motivation for this difference, the assumption appears to be a restatement of facts.

A more general issue is that if we are to admit abstract C° 's as proper head-governors, then we must give up the idea that the class of proper governors contains all and only lexical categories. This in itself is not as undesirable as it might appear at first glance, as long as we have a principled way to determine whether an element belongs to the class or not. It is not immediately obvious that there is some common property that abstract C° 's shares with lexical categories that makes them proper head-governors. It is even much less clear why the overt C° *that* is disqualified from being a proper head-governor because it lacks that property.

In the next two sections, we will explore some solutions to the problem of head-government of the subject trace in the examples in (118)-(121). We should note on the outset that we do have sufficient resources to have head-government of the subject trace. Suppose the structures of these examples contain an abstract complementizer C as in (121)-(123). By FI, it must delete. Subsequently, the verb undergoes head-movement to C . As a result, the subject trace would be head-governed. However, we should be careful about verb movement to C in these cases, since the same movement would also be possible in the ungrammatical cases.

Consider a case of long subject questions. Assuming that the embedded clause in the example in (119) is a CP as in (122), repeated here as in (125), the LF-representation for this example would be exactly the same as that for the example in (124) after deletion of the complementizer *that*, given in (126b):

- (125) a. S-structure: $[_{CP} \text{ Who } [_{do} [_{IP} \text{ you think } [_{CP} t [C [_{IP} t_i \text{ left }]]]]]]$
 b. LF expletive deletion: $[_{CP} \text{ Who}_i [do [_{IP} \text{ you think } [_{CP} t_i [\emptyset [_{IP} t_i \text{ left }]]]]]]$
- (126) a. S-structure: $*[_{CP} \text{ Who } [_{do} [_{IP} \text{ you think } [_{CP} t [\text{that } [_{IP} t \text{ left }]]]]]]$
 b. LF expletive deletion: $[_{CP} \text{ Who}_i [do [_{IP} \text{ you think } [_{CP} [\emptyset [_{IP} t_i \text{ left }]]]]]]$

If we allowed verb movement to C in (125), we would also permit it in (126), an incorrect result since the example in (126) is ungrammatical. Recall that we crucially appeal to the Principle of Last Resort to prevent verb movement to C in (126b), the same principle would of course block the movement in (125b). It seems that there is no natural way to allow verb movement in one case, but not in the other.

One possibility is that the embedded clause in (119) is not a CP at all, but an IP (Mas-sam (1985)). If that is the case, then head-government of the embedded subject trace would be unproblematic:

- (127) $[_{CP} \text{ Who } [do [_{IP} \text{ you think } [_{IP} t \text{ left }]]]]$

The IP is L-marked by the matrix verb *think*, hence is not a barrier for the embedded subject trace. Head-government is thus obtained. However, the assumption that a tensed embedded clause without an overt complementizer is an IP has ramifications elsewhere in the grammar, especially for binding theory. Consider a sentence like that in (128):

- (128) Mary believed $[_{IP} \text{ he is intelligent }]$

In the version of the binding theory which simply stipulates that Nominative case pronominal must be free in the minimal category containing it¹⁹, then the pronominal in

¹⁹Chomsky's (1980) Nominative Island Constraint:

(i) A Nominative anaphor cannot be free in S'.

(128) is indeed free in the IP. No problem would arise. However, in versions of binding theory which crucially depend on government of the pronouns in defining governing categories, then a question would arise as to why a violation of the condition (B) of the binding theory is not violated in (129), where *John* and *he* have the same reference (annotated by the same indices), if the matrix verb actually governs the embedded subject:

(129) John_i believed [_{IP} he_i is intelligent]

The matrix clause would then be the governing category for the pronominal, which in turn means that the pronominal may not be coreferential with the matrix clause, contrary to fact.

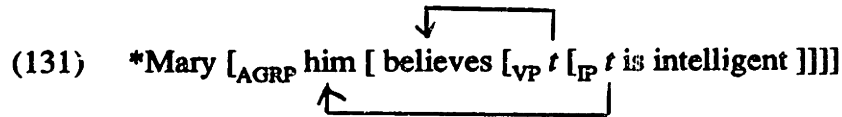
One possible explanation for the possible coreference in (129) is to use of the Minimality condition on binding in that a pronoun must be free in the minimal category that contains a Case-assigner for it (cf. section 1.5.9). In the conception of Case-assignment as Case-feature matching as in Chomsky (1989), a Case-assigner for a category is the head of a projection, in the Spec of which the category is Case-checked (that is, AGR and [+TENSE] INFL for structural Case). The grammaticality of (129) now follows from the fact that the pronoun *he* is indeed free in the IP which contains its Case-assigner, namely, the tensed INFL.

In fact, there seems to be independent reason to assume the Minimality condition on Case-assignment. The grammatical contrast in (130) seems to have nothing to do with binding theory:

- (130) a. Mary believes [_{IP} he is intelligent]
b. *Mary believes [_{IP} him is intelligent]
c. Mary believes [_{IP} him to be intelligent]

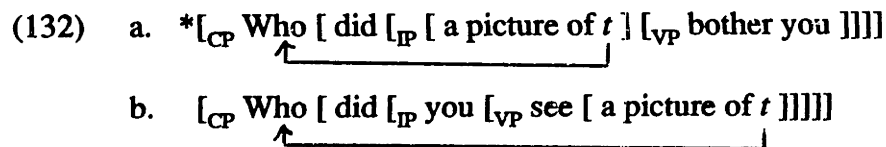
The question is why the sentence in (130b) is ungrammatical. Intuitively, the Case-assigner in the embedded clause has an overriding privilege with respect to Case-

assignment. Formally, the grammatical patterning in (130) falls out naturally from the Principle of Last Resort. The only way the embedded subject can get Accusative case is to raise to the Spec of the matrix AGRP (at LF):

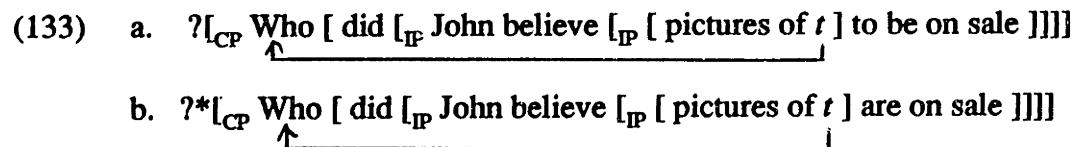


By the Principle of Last Resort, the embedded subject cannot raise. It is already visible in the embedded clause. In addition, the movement as in (131) also violates the Chain Condition. The chain (*him*, *t*) has two Case-marked positions. In sum, assuming the embedded clause as IP does not seem to present a problem of binding theory.

Cases that are more problematic for the assumption that an embedded clause without an overt C° is an IP are the CED violations. The reason why extraction out of the embedded subject in (132) is not allowed is that the embedded subject itself is not head-governed:



Extraction of the *wh*-phrase *who* is possible if it is contained in a phrase in the object position, but not if it is in the subject position. The same argument would also explain the grammatical contrast in (133):



If the embedded subject in (127) is governed by the matrix verb, then the same should obtain in (133b). Insofar as government is involved in extraction, we should expect that the extraction in (133b) is just as acceptable as that in (133a), which does not seem to

co-occur with the fact. We should note, though, that there is a Tense factor involved here. As is well-known, extraction out of a tensed clause is usually worse than that from an infinitival clause:

- (134) a. ?What did you wonder where to put?
b. ?*What did you wonder where you put?

But the contrast does not seem to be as sharp as that in (133). It is quite unclear what might explain the grammatical difference in (133) if the embedded clause is IP.

Although it seems plausible that embedded clauses without an overt complementizer are IPs, an assumption that is crucial for the conjunctive formulation of proper government without abstract C^o's acting as proper head-governors, such an assumption has repercussions elsewhere in the grammar. But we cannot a priori rule out the possibility of looking at the CED violation in a different way, which may turn out to be compatible with the conjunctive ECP. I will leave this possibility for future research.

4.7. Subject Extraction in West Flemish and Dutch Interrogatives

In this section, we will look at subject extraction in interrogatives in West Flemish and Dutch. The primary goal of the section is to show that the grammatical patterning in these constructions has nothing to do with the ECP, but with the distribution of the expletive *er* in the respective language. Unfortunately, it remains unclear what the account for its distribution might be.

4.7.1. West Flemish expletive *er*

Liliane Haegeman (personal communication) points out that extraction of embedded subject in questions is quite marginal in West Flemish:

- (135) ?*Wien peinz-je dat Jan gezien eet?
who think-you that seen has
'Who do you think that Jan saw?'

However, with the presence of *er* in (135), the grammaticality of the example is considerably improved:

- (136) **Wien peinz-je dat er Jan gezien eet?**
who think-you that seen has
'Who do you think that Jan saw?'

One might think that the *that*-trace effect obtains after all in West Flemish (at least in these particular constructions). Some additional facts about other constructions appear to suggest that the grammaticality of the examples in (135) and (136) has to do with the distribution of *er*, rather than with the trace of the embedded subjects left behind by *Wh*-movement.

First, if the extracted subject is complex *wh*-phrase rather than a bare *wh*-phrase, then the result is better²⁰:

- (137) a. ??Wavuomen vent peinz-je dat er Jan en Marie gezien eet?
which man think-you that seen has
'Which man do you think saw Jan and Marie?'
- b. ??Wavuoren venten peinz-je dan der Jan gezien een?
which men think-you that seen have
'Which men do you think saw Jan?'

The Number agreement on the finite verb of the embedded clauses in (137) shows clearly that it is the subjects that have been extracted from the Spec of the embedded IP.

The grammatical patterns in the examples in (135)-(137) seem to correlate with that in extraction of subjects in main clauses. In the examples in (138), *er* is also obligatory:

²⁰The form *der* instead of *er* shows up in (137), which seems to suggest some phonological rule is operative here. For concreteness, we will assume that the underlying form of *er* is /er/, which could also surface as *der* or *ter*.

- (138) a. *Wien komt *(er)?*
 who comes
 'Who is coming?'
 b. *Wien peinst Jan dat *(er) komt?*
 who thinks that comes
 'Who does Jan think is coming?'
 c. *Wien peinst Jan dat *(er) gekomen is?*
 who thinks that come is
 'Who does Jan think came?'

Unlike long-distance extraction, short extraction of subjects requires the presence of *er*, even when the extracted subjects are D(iscourse)-linked (Pesetsky (1987)):

- (139) a. *Wavuomen vent komt *(er)?*
 which man comes
 'Which man is coming?'
 b. *Wavuomen vent is-*(ter) gekomen?*
 which man is come
 'Which man came?'
 c. *Wavuoren venten peinst Jan dan *(der) kommen?*
 which men thinks that come
 'Which men does Jan think are coming?'

The same grammatical judgment obtains as well in short extraction of subjects in constructions involving definite objects. West Flemish differs from Dutch in this respect (cf. the next section on the Dutch expletive *er*):

- (140) a. *Wien eet *(er) nen boek gekocht?*
 who has a book bought
 'Who bought a book?'
 b. *Wavuomen vent eet *(er) nen boek gekocht?*
 which man has a book bought
 'Which man bought a book?'
- (141) a. *Wien eet *(er) dienen boek gekocht?*
 who has this book bought
 'Who bought this book?'
 b. *Wavuomen vent eet-er dienen boek gekocht?*
 which man has this book bought
 'Which man bought this book?'

The expletive *er* is only marginally possible in relative clauses (cf. also Dutch *er* in the next section):

- (142) a. Den vent dan Jan en Marie peinzen die (??er) komt
 the man think comes
 'The man that Jan and Marie think is coming'
 b. De venten da Jan peinst dan (??er) dienen boek gekocht eet
 the men thinks this book bought has
 'The men that Jan thinks bought this book'

Given that the relevant part of the structure involving a subject gap is the same in both relative clauses and interrogatives, it seems that the presence of *er* has nothing to do with the ECP:

- (143) a. ... Wh ... [CP t [C° [IP t ...
 ↑ ...]]
 b. ... O ... [CP t [C° [IP t ...
 ↑ ...]]

Moreover, the expletive *er* also shows up in existential sentences with indefinite subjects like *drie studenten* 'three students', but not with a definite subject like *Jan* (Haegeman (1990)):

- (144) a. ... dan *(der) drie studenten da boek gekocht een.
 that three students that book bought have
 '... that three students have bought that book.'
 b. ... dan (*er) Jan da boek gekocht eet.
 '... that Jan has bought that book.'

Although the expletive *er* in (144a) can be separated by a sentential adverb, as in (145a), it cannot intervene between the complementizer and a definite subject:

- (145) a. ... dan der gisteren drie studenten dienen boek kochten.
 that yesterday three students that book bought
 '... that three students bought that book yesterday'

- b. * ... dan gisteren Jan dienen boek kocht
 that yesterday that book bought
 '... that Jan bought that book yesterday'

One possibility is that subjects are base-generated in the Spec of VP, and stay in their base-position if they are indefinite, but otherwise raise to the Spec of IP at S-structure, perhaps for Case reasons (Haegeman (1990)):

- (146) a. ... [_{CP} dan [_{IP} der [_{VP} gisteren [_{VP} drie student [dienen boek kocht]]]]]
 b. ... [_{CP} dan [_{IP} Jan [_{VP} gisteren [_{VP} t [dienen boek kocht]]]]]

To have a uniform LF-representation, we might assume that indefinite subjects raise at LF to the Spec of IP, adjoining to the expletive (cf. Chomsky's (1986a, 1989) for English *there*. For concreteness, we assume *er* is of the category PP. This choice does not affect our discussion here, however):

- (147) LF raising of indefinite subjects:
 [_{CP} dan [_{IP} [_{PP} er [_{NP} drie student]]
 [_{VP} gisteren [_{VP} t [dienen boek kocht]]]]]

It may be that definite subjects are Case-checked at S-structure, but the indefinite ones are Case-checked at LF. Nevertheless, the question of why the expletive *er* has to appear at all at S-structure is very obscure. Since the distribution of *er* in West Flemish is very much like Dutch, except for some differences pointed out above, we will have a more detailed discussion of it in the connection of the distribution of the Dutch expletive *er* in the next section.

4.7.2. The Dutch expletive *er*

Bennis (1986) points out that with some provision for individual variations, there seems to be a consensus that the example without *er* in (148a) is less than fully grammatical, while the same judgement obtains for the example in (148b) with *er*:

- (148) a. *Wie denk je dat ??(er) komt?*
 who think you that come
 ‘Who do you think is coming?’
 b. *Wie denk je dat (??er) dat boek gekocht heeft?*
 who think you that that book bought have
 ‘Who do you think bought that book?’

The ungrammaticality of the example in (148) is hardly surprising, given that in main clause questions, it is unacceptable without *er*:

- (149) *Wie komt *(er)?*
 who comes
 ‘Who is coming?’

If the structure of (149) is as in (150), namely, *er* in [SPEC, IP] covering up the trace left behind by the *wh*-phrase *wie* ‘who’:

- (150) [_{CP} *Wie* [*komt* [_{IP} *er* [*t*]]]]
- ↑

then we should expect that *er* should show up in the structure for a declarative like that in (151a), given in (151b), according to theories for verb-second languages where there is verb movement to C followed by fronting of the subjects in declaratives (Koster (1975), den Besten (1977), Koopman (1984), Platzack (1986), Vikner and Schwartz (1991) among others). In fact, it is impossible:

- (151) a. *Jan komt (*er)?*
 ‘Jan is coming.’
 b. [_{CP} *Jan* [*komt* [_{IP} *er* [*t*]]]]
- ↑

If the presence of *er* is required in (149) because of the ECP, there is no reason *er* does not show up in (151). It is thus quite difficult to see how an ECP account might work for the distribution of the Dutch expletive *er*.

German thus differs from Dutch in that not only is an expletive impossible in a declarative like that in (151b), it is also impossible in an interrogative like that in (149):

- (152) a. $[\text{CP Hans } [\text{kommt } [\text{IP} (*\text{es}) [t]]]]$
 comes
 'Hans is coming.'
- b. $[\text{CP Wer } [\text{kommt } [\text{IP} (*\text{es}) [t]]]]$
 who comes
 'Who is coming?'

That *er* is impossible in a declarative clause as in (151) appears to be prima facie evidence for Travis' (1984) and Zwart's (1990) proposal that verb-second clauses are not necessarily CPs, but are IPs (at least when the subject occurs sentence-initially). More specifically, if *er* appears in Spec of IP, as in (150), then there is simply no position for *er* in (153):

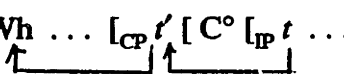
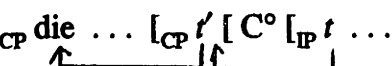
- (153) $[\text{IP Jan } [\text{kamt } [\text{VP } t]]]$.
 'Jan is coming.'

Nonetheless, these two latter theories of verb-second clauses still do not explain why the expletive *er* must show up in a structure like that in (150). If we had a trace in the same position as *er* in (150), we do have both head-government (by the verb in C), and antecedent-government (by the *wh*-phrase in the Spec of CP). Therefore, as far as the ECP is concerned, there is no reason why *er* should appear in the Spec of IP. This then suggests that an ECP account for the distribution of the expletive *er* does not seem to be on the right track.

One further piece of data showing that the presence of the expletive *er* has nothing to do with the ECP comes from the structure of relative clauses. As in the case of West Flemish, the Dutch expletive *er* is only marginally possible in relative clauses (Bennis (1986)):


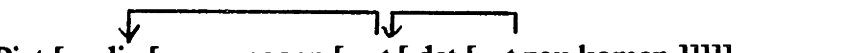
- (154) a. De jongen [_{CP} die [_{IP} ik denk [_{CP} dat [_{IP} (?er) komt]]]]
 the boy who I think comes
 'The boy who I think is coming'
- b. De jongen [_{CP} die [_{IP} ik denk
 the boy who I think
 [_{CP} dat [_{IP} (?er) [op school een boek leest]]]]
 at school a book reads
 'The boy who I think is reading a book at school'

Given that the relevant part of the structure of relative clauses and interrogatives are identical (the part concerning the original trace. Recall that *die* here is in Dutch):

- (155) a. $?*[\text{CP Wh} \dots [\text{CP}' \uparrow [\text{C}^\circ [\text{IP} t \dots$

- b. $?NP [\text{CP die} \dots [\text{CP}' \uparrow [\text{C}^\circ [\text{IP} t \dots$


The representation in (155a) should not constitute an ECP violation any more than that in (155b). There is no island between the original trace and its antecedent in (156), so antecedent-government should obtain. Since the structure in (155b) is grammatically possible, it must be that the original trace is properly head-governed, according to the conjunctive ECP. Indeed, head-government of the original trace should obtain in the structure in (155a) by verb-raising to C (cf. section 4.5.2 for a discussion of head-government in verb-second languages). In sum, the ECP should be satisfied in these structures.

A structure virtually identical to that in (155b) is arguably observed in Topicalization and Clefting (Chomsky (1977)), where *er* does not show up either, according to Bennis:

- (156) a. 
 [_{CP} Die man [denk [_{IP} ik niet [_{CP} t [dat [_{IP} t veel haast zal maken]]]]]]
 that man think I not that much haste will make
 'That man, I don't think will make much haste.'
- b. 
 [_{CP} die [ze zeggen [_{CP} t [dat [_{IP} t zou komen]]]]]]
 it is who they say would come
 'It is Piet who they say would come.'

Again, it seems very obscure how an ECP account for the distribution of *er* might work.

That a syntactic account for the distribution of the expletive *er* does not seem to be very plausible is corroborated by the following array of data, pointed out in Koopman (1983b) and Bennis (1986). The expletive *er* does not occur in constructions in which one of the arguments of the verb is a strong pronoun or definite:

- (157) a. Wie denk je dat (??er) het leest?
 who think you that it reads
 'Who do you think reads it?'
 b. Wien koopt (??er) het?
 who buys it
 'Who is buying it?'
- (158) a. Wie koopt (?er) dat boek van Reve?
 who buys that book of Reve
 'Who is buying that book of Reve?'
 b. Wien denk je dat (??er) dat boek gekocht heeft?
 who think you that that book bought has
 'Who do you think bought that book?'

The grammatical judgment reverses, if the object of the verb in the example in (157a) is indefinite:

- (159) Wie koopt ?(er) een boek van Reve?
 who buys a book of Reve
 'Who is buying a book of Reve?'

Thus, from a syntactic point of view, it remains very unclear how the distribution of the Dutch expletive *er* is to be accounted for.

Bennis (1986) suggests a pragmatic account for the Dutch expletive *er*. Specifically, it is proposed that the occurrence of *er* is regulated by the pragmatic constraint given in (160):

- (160) **Empty Presupposition Condition (EPC)**
 The configuration: [_S (W) X (Y) V° (Z)]
 is pragmatically not well-formed unless X ≠ ∅ and
 X is presuppositional.

where the degree of being presuppositional is defined according to the hierarchy (161), where the feature [\pm SPEC] stands for specificity (W for weak, S for strong):

(161) **Presuppositional Hierarchy (PH)**

+Presuppositional	–Presuppositional
Pron.W - pron.S - names - def.NP - indef.NP	indef.NP - indef.NP
[+SPEC]	[–SPEC]

Bennis argues that the EPC and the PH are justified independently, on which the data in (162) have a bearing:

- (162) a. ... dat een jongen werkt.
 that a boy works
 ‘... That a boy works.’
 b. ... dat er een jongen werkt.
 that a boy works
 ‘... that a boy works.’

According to Bennis, the example in (162a) can only have a generic reading (meaning boys generally work), whereas that in (162b) can only have a non-specific indefinite reading (meaning some boy or another works). If we assume, as Bennis suggests, that the noun phrase *een jongen* ‘a boy’ in (162a) is presuppositional, i.e. it belongs to the class of definite noun phrases, then no *er* is required since *een jongen* ‘a boy’ already is. On the other hand, *een jongen* ‘a boy’ in (162b) is interpreted as non-specific indefinite. If there is no *er* inserted as an empty presupposition, then the sentence would be out by EPC. Being a weak pronoun, *er* can fulfill the function of being presuppositional (cf. (161)). The EPC also explains the different judgments in (163):

- (163) a. ... dat een jongen dat doet.
 that a boy that does
 ‘... that a boy does that.’
 b. ?? ... dat er een jongen dat doet.
 that a boy that does
 ‘... that a boy does that.’

By the PH, demonstrative pronoun *dat* ‘that’, a strong pronoun, in the example in (163a) is presuppositional; therefore, it is well-formed in accord with the EPC, and no *er* is required. In the example in (163b), however, the weak pronoun *er* is presuppositional, and so is *dat* ‘that’ the demonstrative pronoun. If we assume that *er* is present only if there is no constituent with that pragmatic function present, then the unacceptability of (163b) follows from the fact that there is no need for two presuppositions in the example.

Bennis’s particular pragmatic account appears to have some conceptual and empirical problems. Conceptually, it is not clear what notion of presupposition is involved here. Intuitively, presupposition appears to entail some prior knowledge about the entities or their existence that are being discussed. For instance, the sentence in (164a) seems to be implicitly saying that John is married, and that in (164b) appears to imply that some book or another is in existence, which John bought:

- (164) a. John loves his wife.
 b. John bought a book.

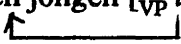

We might say that the existence of John’s wife or some book is presupposed here. If this is correct, then it is unclear what it is to be an empty presupposition, a function that the expletive *er* supposedly fulfills. With the problematic notion of empty presupposition, it is now not obvious why the EPC has anything to do with pragmatics.

It seems possible to account for the distribution of the Dutch expletive *er* in constructions with indefinite subjects of the form [*een* N°] without the feature [±SPEC]. We can derive its interpretation by virtue of the structural position where the subject appears. Suppose subjects are base-generated in [SPEC, VP] at D-structure, and that indefinite subjects may stay in-situ in languages like Dutch and West Flemish (Haegeman (forthcoming)), the S-structures for the examples in (162) would then be as in (165):

- (165) a. . . . [CP dat [IP [VP een jongen] werkt]]
 ‘ . . . that a boy works’

- b. ... [_{CP} dat [_{IP} er [_{VP} een jongen] werkt]]
 '... that a boy works.'

We might assume that it can be interpreted as specific or non-specific, depending on where it ends up at LF. At least for checking of agreement features, *een jongen* 'a boy' in (165b) must raise to [SPEC, IP] at LF. If there is nothing in the [SPEC, IP] as in (165a), then the DP *een jongen* 'a boy' simply raises there, and if the expletive *er* is present, then the expletive adjoins to it, (cf. Chomsky (1986a, 1989)):

- (166) a. [_{CP} Dat [_{IP} een jongen [_{VP} *t* werkt]]]

 b. [_{CP} Dat [_{IP} [_{PP} er [_{DP} een jongen]] [_{VP} *t* werkt]]]


We then might have a semantic interpretive rule saying that a DP in [SPEC, IP] by itself is interpreted as specific, and that adjoined to some constituent in the [SPEC, IP] as non-specific. Consider now the following S-structure, which differs from (166) in that [SPEC, IP] is empty:

- (167) [_{CP} Dat [_{IP} [_{VP} een jongen] werkt]]

Since there is nothing in the Spec of IP, there is no possibility of adjunction for the DP *een jongen* 'a boy'. Consequently, the DP cannot be interpreted as non-specific. Notice that the subject *een jongen* 'a boy' in (167) must raise to [SPEC, IP] at LF for Case-checking. If it stays there at LF, there would be two things wrong with it. One is that it cannot be Case-checked, and is thus invisible for θ -role assignment. The representation is ultimately ruled out by FI. The other thing that is wrong with it is that it would be uninterpretable as specific or non-specific, even if it were possible to devise some other way to assign Case to it. It is not interpreted as specific, since it is not in [SPEC, IP], and not as non-specific, since it is not adjoined to something in [SPEC, IP]. The representation is again ultimately ruled out by FI.

In fact, the account just sketched not only covers for the distribution of *er* in em-

bedded clauses, it also explain the interpretations of indefinite subjects in main clauses as well. In contrast to English, it is almost impossible to interpret indefinite subjects as non-specific in main clauses if they are in [SPEC, CP] (or [SPEC, IP] if one adopts subject-initial non-interrogative root-clauses are IPs):

- (168) a. Een man heeft (*er) een boek gelezen.
 a man has a book read
 'A man read a book.'
 b. [_{CP} Een man [heeft [_{IP} t [t [_{VP} t [een boek gelezen]]]]]]
-

If the structure of the example is as in (168b) then the fact that it is very difficult to interpret the indefinite subject *een man* 'a man' as non-specific follows from it not being adjoined to an element in the [SPEC, IP]. While *er* is possible in (168) with the locative interpretation (in this case, it is perhaps an adjunct to the VP), it is impossible on the existential interpretation (i.e. as an expletive). If we assume that the expletive *er* occurs in [SPEC, IP], with the possibility that it moves to [SPEC, CP] in root-clauses, then the impossibility of having *er* as an expletive in (168) would follow from FI. It cannot undergo Chomsky's (1986a) expletive replacement (by having the associate (i.e. the subject) adjoined to it). On this view, then, the expletive *er* can be freely inserted into constructions with indefinite subjects, an interpretive rule would assign a specific or non-specific in accord with the position where the subject ends up at LF.

The impossibility of having *er* in an example like that in (168a) with the specific reading follows from Bennis' account. Without the presence of *er*, the EPC requires that the subject be interpreted as specific. However, the EPC as formulated in (160) would not rule out the presence of *er* with the non-specific reading. If we take S in (160) as IP, X as *er*, then *er* presumably can fulfill the presuppositional function. It would then be possible to construe the subject as non-specific indefinite.

Although the distribution of *er* in constructions with indefinite subjects appear to be adequately accounted for, it is not at all very clear how it can be extended to the cases of

subject extraction in interrogatives that we have seen. The problem is that in the constructions with indefinite subjects, the presence or absence of *er* simply yield different interpretations. This is not the case for subject extraction in interrogatives, where it is simply very difficult to omit *er*, regardless of interpretation. The semantic account for the distribution of *er* suggested above simply would not explain the near-obligatoriness of *er* in these latter cases.

On the other hand, the EPC does not seem to be significantly more adequate when we look at main clause subject extraction. The example in (169b) is repeated from (149):

- (169) a. $[\text{CP } \text{Wie} [\text{is} [_{\text{IP}} *(\text{er}) [_{\text{VP}} \text{gekomen}] t]]]$
 who is come
 'Who came?'
- b. $[\text{CP } \text{Wie} [\text{komt} [_{\text{IP}} *(\text{er}) [t [_{\text{VP}} t] t]]]]$
 who comes
 'Who is coming?'

The EPC correctly requires that *er* be inserted in (169a), since nothing else in the example is interpreted as presuppositional. While the EPC also correctly requires that an empty presupposition *er* be inserted in (169b), the position where the EPC specifically prescribes is to the left of the verb (cf. the position where the X appears in (160)). If *er* is to be inserted in this position, then the verb would end up in the third position. It would thus be ruled out by the verb-second constraint independently. The presence of *er* to the right of the verb is also unexpected, given the EPC as formulation in (160).

It thus seems that a coherent account for distribution of *er* in constructions with indefinite subjects and some cases of subject extraction in interrogatives is not very straightforward. Indeed, given the difficult and unclear judgments in constructions with *er*, an explanatorily adequate explanation for it is all the more problematic. If *niemand* 'no one' is not presuppositional, then we should expect *er* to be possible in (170a). In fact, it is quite marginal:

- (170) a. Niemand komt (?*er).
 noone comes
 'Noone is coming.'
 b. Wie koopt (er) dit boek?
 who buys this book
 'Who is buying this book?'

Some speakers accept the example in (170b) with *er*, even though there is a definite object *dit boek* 'this book', which is presuppositional according to Bennis' PH in (161). The judgment in (170b) is consistent with that in (171a), where the subject is heavily D-linked (possibly understood as presuppositional):

- (171) a. Welke van deze jongens denk je dat ??(er) komen?
 which of these boys think you that come
 'Which of these boys do you think are coming?'
 b. Wie denk je dat ??(er) komt?
 who think you that comes
 'Who do you think is coming?'
 c. Wie denk je dat morgen komt?
 who think you that tomorrow comes
 'Who do you think is coming tomorrow?'

There is no practically no grammatical difference between the example in (171a) and the familiar (171b), repeated from (148). According to Reuland (1985), some speakers even accept the example in (171c), where instead of *er*, an adverbial like *morgen* 'tomorrow' appears after the complementizer *dat*. It is not clear, though, if the adverbial is in [SPEC, IP] or is an adjunct to VP in (171c) since the example with *er* is possible, which shows that the adverbial *morgen* 'tomorrow' is an adjunct to VP:

- (172) Wie_i denk je [_{CP} dat [_{IP} er [_{VP} morgen [_{VP} t_i komt]]]]
 'Who do you think is coming tomorrow?'

The same situation obtains for main clause subject extraction. Some speakers accept the example in (173) without *er*, but with an manner adverb following the verb:

- (173) Wie werkt (er) ijverig?
who works industriously
'Who works industriously?'

The descriptive problem appears to be that for some obscure reason, [SPEC, IP] is preferably not immediately followed by a verb.

4.8. Conclusions

In this section, I argue that the expletive replacement analysis not only accounts for the grammaticality of constructions involving complementizer agreement, it also explains the lack of the *that*-trace effect in these constructions. Specifically, I show that antecedent-government is irrelevant, and the ungrammatical instances of the *that*-trace sequence are due the failure of head-government. On this view, the trace of embedded subjects are properly head-governed by a verb which has undergone abstract movement to C. One desirable consequence that follows is that the class of proper head-governors can be restricted to all and only lexical categories. A new way of looking at the parametric variations with respect to the *that*-effect emerges. A *that*-trace sequence is acceptable only if abstract movement to C is possible. Although there are still some cases that the conjunctive formulation of proper government cannot handle without complicating other modules of the grammar, facts about extraction out of *wh*-islands are shown to be adequately covered by the conjunctive ECP, where head-government obtains but antecedent-government fails.

Chapter 5

Abstract Verb Movement and Theory of Predication

5.1. Introduction

In this chapter, I argue that there must be S-structure operator movement in relative clause, and that predication theory motivates abstract verb movement to C. Specifically, I show that the adoption of a predicate principle according to which a lexical head must fill the head-position of a relative clause would account in a straightforward way for the anti-*that*-trace in relative clauses, without appealing abstract agreeing complementizers acting as proper head governors. The account suggested here thus affords a unified treatment of the complementizer *that* in both relative clauses and complement clauses despite the fact that the *that*-trace effect and the anti-*that*-trace shows up with the same complementizer. The grammatical difference is reduced to motivation of verb movement to C.

The chapter is organized as follows. Section 5.2 points out some of the issues in theory of proper government raised by the structure of relative clauses. Section 5.3 goes over some proposals in the literature dealing with these issues, and discusses their implications. In section 5.4, we will be concerned with the syntax and semantics of relative clauses; specifically, we will look at the distribution of overt *wh*- and empty operators as well as the bearing of predication theory on these constructions. I argue that operator movement must occur in accord with predication theory, and that a predicate principle requires abstract verb movement to C in relative clauses. I show in section 5.5 that the conclusions reached in the last section have desirable consequences for theory of proper government. The grammatical difference between the *that*-trace sequence in complement

clauses and that in relative clauses will be shown in section 5.6 to follow straightforwardly from the possibility of abstract verb movement to C. We discuss in section 5.7 cases of short subject extraction in main clauses and embedded clauses. I argue that abstract verb movement to C motivated by the predicate principle is not applicable in these cases, and suggest that there be some independent constraint on root-clauses, of which the rule of *do*-support at S-structure is an instance, to the effect that the head position of a root-clause must be filled at LF, if not already at S-structure. In the end of the chapter is an appendix briefly mentioning some grammatical short subject zero-relatives in some dialects of English.

5.2. Issues in Relative Clauses

Before we dwell on the details of relative clauses, let us first fix some terminology to avoid confusion and misunderstanding. In a structure like the ones in (1) (putting traces aside):

- (1) a. The man [who John saw]
- b. The man [that John saw]
- c. The man [John saw]
- d. The book [which John saw]

We will refer to the bracketed constituents in (1) as **relative clauses** (or simply **relatives**), whereas *who* in (1a) or *which* in (1d) as **relative pronouns**, as traditional grammars would call them. For relative clauses like those in (1) in which an object is extracted, we refer to them as **object relativization**. For convenience, let us call a relative with an overt *wh*-phrase serving as a relative pronoun like the ones in (1a) and (1d) as a ***wh*-relative**, one with a complementizer *that* like the one in (1b) as a ***that*-relative**, and one with neither a complementizer nor a relative pronoun like the one in (1c) as a **zero-relative**. We will also refer to the entire expressions in (1a)-(1d) as **relativized noun phrases**, and the noun in the position of *man* or *book* in (1) as the **relative head**. With this terminology in mind, let us now consider cases of subject extraction in relative

clauses that have only one embedding CP (henceforth short subject relatives) like those in (2):

- (2) a. The man who saw John
- b. The man that saw John
- c. *The man saw John

Besides the question of what structures we should assign to the examples in (1) and (2), some issues for theory of proper government immediately arise if there is movement in these examples. This is particularly true for the conjunctive formulation of proper government which requires both head-government and antecedent-government of traces, if the ECP is not to be violated. It is not obvious that head-government obtains in the examples in (2b) and (2c).

Suppose the structures for the examples in (1) are approximately like those in (3), where *O* is an empty operator (We henceforth refer to both empty operators and relative pronouns as relative operators. Cf. the discussion of operators and their distribution in section 5.4.3. The labels on the constituent bracketing here unspecified until the point where the categorial features of these projections become relevant):

- (3) a. The man [who [*t* saw John]]
 ↑
 b. The man [*O* that [*t* saw John]]
 ↑
 c. *The man [*O* [*t* saw John]]
 ↑

the questions for theory of proper government would then be: (i) what is the head-governor of the subject trace in (3a) and (3b)? (ii) why is the same not true in (3c)? Of course, we would also ask the question of whether there is movement in short subject relatives, and how much the structures of these examples have a bearing on theory of proper government.

The grammatical contrast between (3b) and (3c) immediately reminds us the reverse contrast in complement clauses with respect to the *that*-trace sequence:

- (4) a. Who do you think [*t* left]
 b. *Who do you think [that [*t* left]]
-

If the grammatical difference between (4a) and (4b) is what is called the *that*-trace effect, then that between (3a) and (3b) should perhaps be called the anti-*that*-trace effect (Taraldsen (1986b)). Some of the issues in this connection would be: (i) are the complementizer *that* in relative clauses and the one that appears in complement clauses one and the same? If the answer is negative, then the question would be (ii) what is the difference between them that renders the observed grammatical contrast? If the answer to (i) is positive, as an optimal theory of grammar should aim for given that they have the same phonetic make-up, then the questions would be (iii) why is the *that*-sequence possible in relatives, but impossible in complement CPs? and (iv) what principles underly the grammatical difference? In the next several sections, we will consider some answers to these questions.

5.3. Abstract and Agreeing Complementizers in Relative Clauses

Rizzi (1990a) suggests that contrary to appearance, there is actually an abstract complementizer with a null phonetic matrix filling the head-position in the structure of a *wh*-relative like that in (2a), the structure of which would then be something like that in (5):

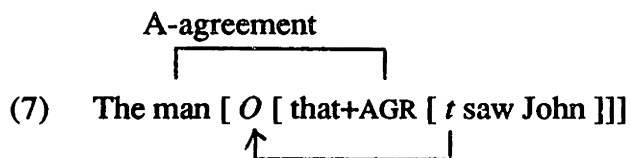
- (5) The man [*who*_{*i*} [AGR_{*i*} [*t*_{*i*} saw John]]]

This abstract complementizer is the result of expanding the category C into a bundle of agreement features:

- (6) C → $\left\{ \begin{array}{l} \textit{that} \\ \text{AGR} \end{array} \right.$

In addition, according to Rizzi, when an overt *wh*-operator moves into the Spec of CP, agreement in C is turned into a proper governor by virtue of Spec-head agreement. The co-indexing of the relative pronoun *who* and AGR in (7) thus indicates the agreement. Consequently, the abstract C comes to head-govern the subject trace, and head-government requirement for the conjunctive ECP is thus satisfied.

For *that*-relatives, Rizzi claims that there is A-agreement (that is, agreement with an A-position) between the complementizer *that* and the relative head. Thus, although the complementizer *that* is basically inert for proper government, as can be seen in the ungrammatical *that*-trace sequence in a complement clause like that in (4b), by A-agreement, the complementizer *that* in (2c) is turned into a proper governor. The structure of the example in (2c) would be something like that in (7):




Rizzi cites the Arabic example in (8a) (where ? is the representation for the glottal stop), due to Borer (1984), to support the idea of A-agreement, if it has the structure as in (8b):

- (8) a. Ra?ay l-fatata ?allati yuridu ?ax-i an yatawwaza-ha
 'I saw the girl that+AGR want my brother that .narry-her'
- b. Ra?ay l-fatata [_{CP} O_i [?allati [_{IP} yuridu ?ax-i an yatawwaza-ha_i]]]

In (8b), if *?allati* is a complementizer, agreeing with the relative head *l-fatata* 'the girl' in grammatical features (according to Borer (1984), the relevant features here are Number, Gender and Case), and the presence of a resumptive pronoun *ha* 'her' is taken to indicate that there is no movement involved (in other words, no empty operator is involved), then the complementizer *?allati* cannot possibly agree with an empty operator in its Spec. (cf. section 5.8 on agreement in COMP).

For zero-relatives, however, Rizzi suggests that the empty operator is anaphoric, and that there is general incompatibility of anaphoric elements with agreement processes; therefore, the abstract null complementizer C would not be turned into a proper governor as a result of such an incompatibility. Let us formally represent the lack of agreement between the null complementizer and the empty operator as the absence of co-indexing, as in (9):

(9) *The man [O [C° [t saw John]]]


The ungrammaticality of (9) is then due to the lack of a head-governor for the subject trace. As for the incompatibility of anaphoric elements with agreement processes, Rizzi adopts the ideas found in Aoun and Clark (1985) and Contreras (1986) that an empty operator is intrinsically incompatible with a local construal with agreement, and this is perhaps a consequence of the anaphoric properties of null operators. Rizzi also points out the suggestion made in Tellier (1988) that the ungrammaticality of (7) can also be accounted for if we assume deletion of Spec of CP, leaving no features; therefore, there are no features in the Spec of CP for the null complementizer to agree with. The difference between the grammatical short subject *wh*-relatives and the ungrammatical short subject zero-relatives is then reduced to the assumption that unlike overt *wh*-operators, empty operators are anaphoric, or that they have no inherent features.

Although the idea of abstract and agreeing complementizers adequately accounts for the grammatical patterns of short subject relativization, there are certainly some issues that we need to address. The first issue is the notion of A-agreement. It is not quite clear what exactly A-agreement is. Consider the familiar subject-verb agreement in IP:

(10) [IP John [I' is [VP running]]]

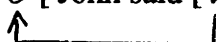
In most theories, the Spec of IP is an A-position, at least when it is occupied by the subject. Agreement with the Spec of IP is thus a case of A-agreement, if A-agreement

really is agreement with an A-position. However, the structural relation for the agreement between the complementizer and the relative head as in (10) is definitely not the same as that between the Spec of IP and I^{NFL}. That is, while the subject-verb agreement in (10) is simply the familiar Spec-head agreement, licensed by the X'-theoretic Spec-head relation, agreement between the complementizer and the relative head as in (7) is not. Thus, A-agreement then must be something other than agreement with an A-position. For description purposes, let us continue to use the term A-agreement to refer to the agreement between the complementizer of the relative clause and the relative head.

The strongest evidence for A-agreement is the Arabic example given in (11) where there is morphological alternation of the complementizer, if it is indeed a complementizer. Thus, if it turns out that the example can be given a plausible alternative analysis, then the notion of A-agreement has no independent justification. As we will see in section 5.8 that one such alternative is available. However, it seems that even if it can be established that there is A-agreement in some language L, it does not necessarily follow that English also has A-agreement as well. In order to claim that English has A-agreement, we need to show that (i) the language L and English share some property P, and that (ii) the property P is responsible for A-agreement. To the extent that English and Arabic have some common properties, it is not clear which property among them can be claimed to be responsible for A-agreement.

The second issue that we need to address is the idea that there is general incompatibility of empty anaphoric elements with local agreement processes, assuming of course that empty operators are anaphoric elements. With respect to the property of being anaphoric, the empty operator in (11) should have exactly the same properties as that in (9):

(11) The man [*O* [John said [*t* [has left]]]]



The issue here is of course not the embedded subject trace, but the compatibility of empty operators and agreement processes. Nevertheless, the grammatical difference between (9) and (11) immediately raises some questions about the claim that empty operators are not compatible with agreement processes.

To the extent that there is morphological manifestation of agreement, it seems quite possible to have agreement between the relative head and some element inside the relative clause. In fact, empty operators, just like overt *wh*-operators, may agree with some element that is arbitrarily deeply embedded inside the relative clause, as illustrated in (12) and (13):

- (12) a. The man [*O* [John said [Bill claimed [*t* was/*were here]]]]
 ↑ _____|
 b. The men [*O* [John said [Bill claimed [*t* were/*was here]]]]
 ↑ _____|

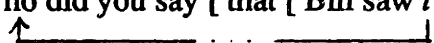
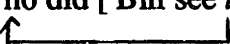
- (13) a. The man [who [John said [Bill claimed [*t* was/*were here]]]]
 ↑ _____|
 b. The men [who [John said [Bill claimed [*t* were/*was here]]]]
 ↑ _____|

There is of course the question of how to capture the apparent agreement between the relative head and the verb with which it has the same set of ϕ -features. If the analysis for the agreement suggested in section 5.8 is correct, according to which the agreement is mediated by the empty operator, then the agreement facts in (11), (12) and (13) would be very difficult to account for if we assume that there is general incompatibility of empty

operators with agreement processes¹.


The difference between the example in (9) and those in (11), (12) and (13) is that we have local extraction in (9), but long-distance extraction in the latter examples. Unless we want to claim that empty operators are compatible with long-distance agreement processes, but not with those of short distances, it seems that, quite generally, empty operators are entirely compatible with agreement processes. When we look at other phenomena that have a bearing on the difference between long-distance versus short distance, we observe exactly the other way round.

In English, whenever we can extract an element over a long-distance domain, take for example *wh*-movement as in (14a), we can also extract it over a shorter distance, as in (14b):

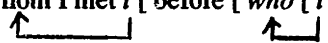
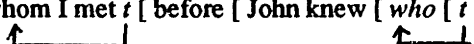
- (14) a. Who did you say [that [Bill saw *t*]]

 b. Who did [Bill see *t*]


In Welsh, although we can extract an argument in short distance, we cannot extract it long-distance (Sadler (1988). Cf. section 2.4.2.):

¹Rizzi (1990a: Chapter 2, fn 28) points out the ungrammaticality of the example in (i) as support of the idea that empty operators are not compatible with agreement processes:

- (i) *The guy whom I met *t* [before [*O* [*t* left]]]


However, it is far from clear that the ill-formedness of the example has anything to do with agreement. According to Rizzi, overt *wh*-operators have no problem with agreement processes. However, a *wh*-operator in the same environment as in (i) is impossible:

- (ii) a. *The guy whom I met *t* [before [*who* [*t* left]]]

 b. *The guy whom I met *t* [before [John knew [*who* [*t* left]]]]


The ungrammaticality of (iib) shows that we say that the reason why (iia) is impossible is because a *wh*-phrase is in the Spec of the complement of *before*, which does not take a [+WH] complement. It seems that whatever rules out the examples in (ii) would also disallow that in (i). The reason why the *before*-clause cannot serve as a relative clause predicated of the relative head *guy* is due to it not being a syntactically well-formed relative clause, according to the theory of predication suggested in section 5.4.3.

- (15) a. Pwy a welodd Mair *t*?
 who prt saw.3SG
 'Who did Mary see?'
 ↓
- b. *Pwy y dywedodd Siôn y gwelodd Mair *t*?
 who prt said.3SG saw.SG
 'Who did John say that Mary saw?'

For PPs, however, we can extract them over long-distances, as in (16a). As we expect, we can also extract them over shorter distances, as in (16b) (cf. section 2.4.1.3 for a discussion of the extraction asymmetry between nominal projections and PPs):

- (16) a. A bwy y dyweddodd Siôn yr oedd Mair yn siarad *t*?
 with who prt said.3SG prt was prt speak
 'Who did John say that Mary was speaking with?'
 ↓
- b. A bwy yr oedd Mair yn siarad *t*?
 with who prt was prt speak
 'Who was Mary speaking with?'

The Welsh data presented above thus indicate that if processes over long distances are possible, then the same processes are also possible over shorter distances.

The same line of argumentation would also apply to the idea of deletion in [SPEC, CP]. If the reason why the example in (9) is impossible is because the operator in the Spec of CP is deleted, leaving no features behind to turn the abstract complementizer into a proper governor, then the same deletion of the operator also apply for the examples in (11), (12) and (14). If the deletion of the empty operator would leave no features behind, then why should the finite verb require a singular verb when the head relative is singular?

The third and fourth issues are quite general. If we are to adopt Rizzi's account of relative clauses, then we need to posit abstract complementizers, which may under certain circumstances act as proper governors. We also need to justify Spec-head agreement in CP in English, the language that we are looking at. Again, although this possibility


cannot be excluded out of hand, independent evidence for it is hard to come by. This is particularly true of abstract complementizers, which have neither phonetic content, nor properties other than proper government, the property that is at issue here. In fact, except complementizers like *if* (and perhaps *whether* as well, cf. Kayne (1990)), namely, those that head interrogative complements, other complementizers like *that* appear to have no semantic content, and in accordance with FI will be removed at LF. If this is correct, then in fact complementizers cannot possibly be proper governors. They are not present at LF.

Again, independently of the question of whether there is Spec-head agreement in CP (cf. sections 3.5 and 5.8), even if it can be established that some language *L* has Spec-head agreement in CP, it does not necessarily follow that English also has it. In fact, just like in the case of A-agreement, in order to claim that English has agreement in CP, we need to show that (i) English and *L* have share some property *P*, and that (ii) the property *P* is responsible for Spec-head agreement in CP. It is not obvious what the property *P* is that is responsible for agreement in CP, let alone whether English has the property *P*.

The fifth issue, which is closely related to the ones we have discussed, is that within Rizzi's assumptions there are apparently some redundancy and inconsistency with the notion of A-agreement. Consider a *wh*-relative like the one in (17):

(17) The man [who [C° [*t* left]]]

Since the example in (17) is grammatical, it must be that the abstract complementizer *C* has features by Spec-head agreement. What this means is that this abstract complementizer *C* may acquire features. Notice that *C* in (17) can also have features by A-agreement with the relative head, whence the redundancy. Consider now a zero-relative with a structure like that in (18), with an abstract complementizer, as assumed in Rizzi's account:

(18) *The man [O [C° [t left]]]


There does not seem to be anything that prevents A-agreement between the abstract complementizer C and the relative head². Yet the example is ungrammatical.

With these issues in mind, let us now explore an alternative in which they do not arise. In particular, let us explore an alternative according to which it is not necessary to appeal to some abstract or agreeing complementizers in relative clauses, or the notion of A-agreement. Instead, I will argue that the grammatical patterns in relative clauses that we saw above can be accounted for by implicating theory of predication and Principles of Full Interpretation and Last Resort, which as we have seen have independent justification.

5.4. Predication Theory and Relative Clauses

In this section, we will discuss some assumptions about the syntax and semantics of relative clauses that a syntactic theory needs to make independently of other modules of grammar. We will first discuss the semantics and the syntactic representation of relativized noun phrases, then turn our attention to the internal structure of the relative clauses, and the distribution of relative operators. We end this section with a syntactic constraint on the lexicality of the head of a relative clause.

5.4.1. The Structure of Relativized Noun Phrases

There was considerable amount of research devoted to the syntax of relative clauses in the early literature on generative grammar. While Chomsky (1965) suggests the D-structure of relative clauses as something like that in (19a) (cf. also Smith (1964)), where the surface structure is derived by extraposing the clause to the right:

²Rizzi (1990a: Chapter 2, fn 30) notes that this might in fact be allowed, given that there are dialects that allow short subject zero-relatives. Cf. Appendix for some remarks on these dialects.

- (19) a. $[_{NP} [_{DET} D^{\circ} S] N]$ b. $[_{NP} D^{\circ} [_{NOM} Nom S']]$
 c. $[_{NP} [_{NP} D^{\circ} Nom] S']$ d. $[_{N''} [_{ART''} D^{\circ}] [_{N'} N' S']]$

Stockwell, Schachter and Partee (1973), and Partee (1975) argue on semantic grounds that the structure in (19b) is to be adopted, whereas Bach and Cooper (1978) claim that a compositional semantics can be provided for the structure in (19c). Jackendoff (1977) on the other hand suggests the structure on (19d) (cf. also Head-raising analysis suggested in Vergnaud (1974) and Schachter (1973)). However, except for the structure in (19b), the rest is not compatible with current assumptions about phrase structures and X'-theory. In fact, we will see that a variant of the structure in (19c) should be adopted.

Proposing the DP-analysis of noun phrase according to which noun phrases are projections of Ds, Abney (1987) suggests that a relativized noun phrase should have the structure as in (22), with the relative clause as a sister to D'³:

- (20) $[_{DP} D^{\circ} NP CP]$

Browning (1988) on the other hand argues for the structure in (21):

- (21) $[_{DP} [_{D'} D^{\circ} NP] CP]]$

³Abney notes the contrast in (i) and (ii), and claims that the CP relative clause is licensed by determiners other than $[_{D} AGR]$ (i.e. possessives):

- (i) a. A/The book that I read
 b. Books that I read

 (ii) My/John's books that I read

He proposes a variant of the structure in (19a) as the D-structure for the relativized noun phrase in (ia), which subsequently extraposes:

- (iii) a. D-structure: [the that I read] book
 b. S-structure: [the] book [that I read]

It is not clear from his exposition what the precise structure of the D-structure in (iiia) is, and why the S-structure of a relativized noun phrase should be as in (20), which apparently violates X'-theory.

She presents the grammatical patterning of definite noun phrases in relative clauses and clefts to support her claim. Browning points out that gaps in relatives appear to be indefinite even when the relative heads are definite (the b-examples were attributed to Noam Chomsky and the c-examples to Schachter (1973)):

- (22) a. *There were the men in the garden.
 b. *John had the question for the teacher.
 c. *We made the headway on the problem.
- (23) a. The men that there were in the garden were all diplomats.
 b. The question that Hohn had for the teacher was a difficult one.
 c. The headway that we made on that problem was not sufficient.

The grammaticality of the sentences in (23) are to be contrasted with the cleft sentences in (24):

- (24) a. *It was the men that there were in the garden.
 b. *It was the question that John had for the teacher.
 c. *It was the headway that we made on that problem.


She claims that the structure in (21) would account for the ungrammaticality of the sentences in (24). In particular, if a sentence like that in (24a) has a structure like something in (25), where *O* is an empty operator, defined in (26) (from Browning (1988)), moving from its base-position to the Spec of CP:

(25) *It was [_{CP} [_{DP} [_{DP} the men] [_{CP} $\overset{O}{\uparrow}$ that [_{IP} there were *t* in the garden]]]]

(26) An empty category is an operator iff it is in the Spec of CP.

The antecedent of the empty operator *O* in (25), according to Browning, is the DP *the man*, which is fully specified for the feature definite. If the empty operator *O* has the same definiteness feature as its antecedent, then the representation in (25) violates the definiteness restriction in the existential *there* environment (Reuland and ter Meulen (1987)), of which the CP in (25) is an instance.

The subject of a sentence like that in (23a), however, has the structure as in (27), an instantiation of the schema in (21):

(27) $[_{DP} [_{D'} [_{D'} \text{The} [_{NP} \text{men}]]] [_{CP} O [\text{that} [_{IP} \text{there were } t \text{ in the garden}]]]]] \dots$


The antecedent of the empty operator *O* is an NP (*men* in (27)), which has no feature specification for definiteness; hence, the definiteness restriction in the existential *there* environments is not violated.

Although Browning's argument seems to be correct, she does not make a distinction between restrictive relatives and appositive relatives. I now argue that a restrictively relativized noun phrase and an appositively relativized noun phrase should have the structures in (27a) and (27b) respectively:

(28) a. $[_{DP} D^{\circ} [_{NP} NP [_{CP} O_i [\text{that} [_{IP} \dots t_i \dots]]]]]]]$
 b. $[_{DP} DP [_{CF} O_i [\text{that} [_{IP} \dots t_i \dots]]]]]$

the CPs in these constructions are not selected, they are thus adjuncts. In (28a) the relative clause is an adjunct to NP, and in (28b) it is an adjunct to DP.

With a restrictive relative as an adjunct to the NP as in (28a), the absence of the definiteness effect in the sentences in (23) is as expected. In the structure for the subject of the sentence in (23a), something like that in (29):


(29) $[_{DP} [_{D'} \text{The} [_{NP} [_{NP} \text{men}]] [_{CP} O_i [\text{that} [_{IP} \text{there were } t_i \text{ in the garden}]]]]]]] \dots$

the antecedent of the empty operator is an NP, which has no definiteness feature. Therefore, the definiteness restriction in the *there*-environment is not violated. However, with the structure as in (28b) for appositive relatives, we can explain the ungrammaticality of the sentence in (30a), which is not covered in Browning's analysis:

- (30) a. *The men, who there were in the garden, were all diplomats.
 b. [DP [DP the men] [CP who_i [IP there were t_i in the garden]]] . . .

As the structure in (30b) clearly shows, the antecedent of the *wh*-operator is the DP *the men* which is fully specified as definite. The definiteness restriction in the *there*-environment is violated here.

With the structural distinction between restrictive and appositive relatives as given in (28), we can also explain the apparent weak cross-over effect in those constructions, an example of which is given in (31) where *the man* and *his* has the same reference:

- (31) a. ?*The man who his mother loves is here.
 b. [DP The [NP [NP man] [CP who [his mother loves t]]]] is here.
- 

The fact that the sentence in (31a) cannot have an interpretation in which the pronoun *his* is co-referential with *the man* can be attributed to some constraint like Vergnaud's (1974) *i*-within-*i* condition or Higginbotham and May's (1981) constraint on referential circularity, according to which a noun phrase cannot have the same reference with a noun phrase it contains. The DP *the man* in (31b) in fact contains the CP containing the pronoun *his*; therefore, the two expressions cannot have the same reference.

This concludes our discussion of the structure of relativized noun phrases. Before we turn to the internal structure of the relative clause itself, let us consider first the question of what semantic interpretation we should ascribe to relative clauses, since it has some consequences for the theory of the internal structure of relatives.

5.4.2. Semantics of Relative Clauses

It is commonly assumed in the semantic literature, that relative clauses are predicates or open sentences (Chomsky (1977)). In the view of Williams (1980), the relative clause is said to be predicated of the relative head. Using Church's (1940) lambda-calculus for predicate-abstraction, we can represent the semantic representation for a relative clause as an lambda-abstract (cf. Partee (1973), Sag (1976) and Williams (1977)). Thus, a (restrictive) relative clause whose surface form as that in (32a), putting aside the determiners and their semantics here, would have a semantic representation like that in (32d):

- (32) a. man who John saw
 b. [man] = $\lambda y(\text{man}(y))$
 c. [who John saw] = $\lambda z(\text{John saw } z)$
 d. [man who John saw] = $\lambda x(\lambda y(\text{man}(y))(x) \wedge \lambda z(\text{John saw } z)(x))$


where the λ -expressions simply denote properties, with λ as the predicate-abstractor, some sort of operator. The λ -expression in (32b) then denotes the property of being a man, and that in (32c) the property of being seen by John. The semantic representation of the relativized noun phrase in (32a) would be something like that in (32d), which denotes the (set-)intersection of the two properties, by the meaning of the logical connective \wedge , that is, the property of both being a man and seen by John.

The semantics of relatives that involve pied-piping is more or less the same as that of subject and object relatives, although the relation between it and S-structure syntax is much less straightforward, since the two representations do not correspond in a simple fashion like the case of relativization not involving pied-piping. Consider the example in (33), which clearly shows movement of subject at S-structure:


- (33) a. D-structure: man [John said [whose parents are rich]]
 b. S-structure: man [whose parents [John said [*t* are rich]]]
 c. Semantics: $\lambda x((\lambda y(\text{man}(y)))(x) \wedge (\lambda z(\text{John said } z\text{'s parents are rich}))(x))$

In contrast with the λ -expression in (13c) where the variable x corresponds to the S-structure *wh*-phrase, that in (33c) does not. In fact, the variable x corresponds to only a subpart of the *wh*-phrase *whose parents*, namely, *whose*. In a sense, it is as if the λ -expression in (33c) is obtained by moving, at LF, the *wh*-phrase *whose parents* back to its D-structure position, then *whose* is extracted to the Spec of CP, something like (34), which is an impossible S-structure:

(34) *man [_{CP} whose [John said [_{IP} [_{DP} t parents] are rich]]]



This is a divergent point between the surface syntax and the LF-syntax. Although the divergence is striking, but there seems to be no other way to derive an LF-representation that corresponds to the λ -expression in a simple way. A similar point can be made for relative clauses with PP-pied-piping. In an S-structure representation like that in (35a), the meaning of the relative clause is the λ -expression given in (35c), which does not correspond to its S-structure representation in any transparent way:

- (35) a. S-structure: book [_{CP} [_{DP} the cover of which] [_{IP} Mary likes t]]
- 
- b. LF: book [_{CP} which _{i} [_{IP} Mary likes the cover of t_i]]
- c. λx (Mary likes the cover of x)

To attain transparency, we appear to have no other option but to reconstruct the pied-piped DP in its base-position, as in (35b). Thus, we will henceforth assume reconstruction for pied-piped constituents (Cf. also section 5.8 for a discussion of agreement in relative clauses involving pied-piping).

5.4.3. The Internal Structure of Relative Clauses

If we assume the semantics of relative clauses as sketched in the last section, then one natural question that we would like to ask is how the semantics is connected to the syntax. In other words, we would want to see what the syntactic form of a relative clause should look like, and the relationship between it and the λ -expression, which we take to be its semantic representation. In this section, we will first look at the issue of operator movement, and see how the structure is related to the semantics of relative clauses. We then consider the question of where the operators eventually rest in the structure, and of the motivation of abstract verb movement to C.

5.4.3.1. On Relative Operators

The fact that there are island effects in relative clauses strongly suggests that movement is involved in these constructions. In languages like English where *Wh*-movement is obligatory in (non-echo, non-multiple *wh*) interrogatives, it is not surprising that operators in relative clauses also move. We will see in section 5.7.3 why interrogative *wh*-phrases must move, let us consider here the question of why relative operators must move. Safir (1986) suggests that the relative head must bind something in COMP (in his term R-binding, binding of the relative pronoun by the relative head):

(36) R-binding cannot be vacuous in COMP.

He claims that the condition in (36) can be derived from a stronger constraint:

(37) **Locality Condition on R-binding (LCR)**

If X is locally R-bound, then X is the structurally highest element in COMP.

The LCR would require that the relative operator move to the Spec of CP, the highest position in the relative clause.

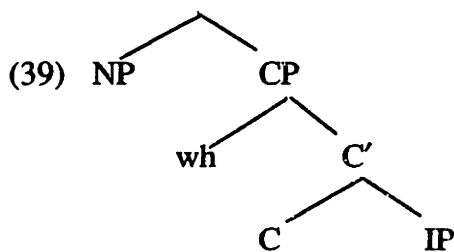
Insofar as the LCR is unrelated to principles or other components of the grammar in any obvious way, it thus appears to be a mere description of the fact that a relative

operator must c-command the rest of the relative clause. In what follows, we will look into the possibility of deriving the LCR from semantic grounds.

Browning (1987) proposes that the movement of relative operators be related to predication theory. Specifically, she suggests that the reason why relative pronouns, or some constituent dominating it, must move to the Spec of CP is due the licensing conditions for subject-predicate relation, given in (38):

- (38) A subject-predicate relation is licensed if
- a. the subject discharges the external θ -role of the predicate; or
 - b. the subject agrees with a chain contained in the predicate.

where an agreement chain is taken to be a chain constituted by the *wh*-operator in [SPEC, CP] and the trace in argument position it binds (cf. also section 5.8):



To our immediate concerns here is the second licensing condition in (38b). Thus, the fact that relative operators must move to the highest [SPEC, CP] is to enter into an agreement chain. Otherwise, the subject-predicate relation between the NP relative head and the CP relative clause would not be licensed. Consequently, failing to enter into a predication relation, the CP would not contribute to the meaning of the representation containing it. FI would then be violated.

Browning's proposal has some initial appeal in that it particularly relates the semantic function of relative clauses to predication theory. However, apart from the problems with the notion of agreement chain in constructions involving pied-piping (cf. section 5.8), there is no obvious reason why an agreement chain should implicate Spec-head agreement with the C° (cf. section 5.8 for a possible account of agreement in relative clauses).

In fact, there is some problematic semantic issue for Safir's proposal as well as Browning's in connection with constructions involving pied-piping. On the one hand, Safir suggests that in the familiar example in (40a):

- (40) a. These reports, the height of the lettering on which
the government prescribes, are tedious.
b. These reports, [_{S'} [_{COMP} [_{which_i} [_{the height of the lettering on t_i}]]_j]]
[_S the government prescribes t_j]], are tedious.

the *wh*-phrase *which* is adjoined to the pipe-pied NP (in our terms, a DP) in COMP, as in (40b). On the other hand, the licensing condition for subject-predicate relations given in (38b) would require that the relative operator *which* enter into an agreement chain to licensed the relation between the relative head, and the relative clause. Specifically for the example in (40), the relative pronoun *which* must end up in a configuration very similar to that in (40b) (cf. section 5.8 for specific mechanism of agreement chain in this case):

- (41) These reports, [_{CP} [_{DP} *which_i* [_{DP} the height of the lettering on t_i]]_j]]
[_{IP} the government prescribes t_j]], are tedious.

The problem with the representations in (40b) and (41) is that it is not clear what the bracketed *S'* or *CP* mean semantically. The λ -expression for the modifying relative clause in the example in (40a), which we take to be its meaning, is that given in (42):

- (42) $\lambda x(\text{the government prescribes the height of the lettering on}(x))$

The representations in (40b) and (41) do not correspond in any straightforward way to the λ -expression in (42). Compare a more transparent representation with respect to the λ -expression, which is the result of reconstructing the S-structure pied-pied DP to its base-position:

- (43) . . . [_{CP} which_i [_{IP} the government prescribes
 [_{DP} the height of the lettering on t_i]]]

The representation in (43) seems to correspond to the λ -expression in a very simple manner, with the S-structure relative pronoun translated as the λ -operator and its trace as the variable at LF.

A much more straightforward answer to the question of why relative operators must move is readily available by appealing to the mapping between LF-representation and semantics. Looking at the λ -expressions of sort illustrated in (44a), we see that they have the form of operator-variable binding, with λ as a sort of operator having scope over the predicate it abstracts:

- (44) a. $\lambda x(\dots x \dots)$
 b. $wh_i [\dots t_i \dots]$

We then should expect the syntactic form of a relative clause to correspond to the λ -expression in some fashion. It seems natural to assume that it should have an operator-variable binding configuration as well. We might take the relative pronoun as the S-structure operator corresponding to the λ -operator in the semantic representation, as Browning observes. Since the λ -operator has scope over the predicate it abstracts, it then follows that the relative pronouns must c-command the clause that corresponds to the predicate. We can take these two conditions as constraints on the syntactic form of relative clauses:

- (45) The syntactic form of a relative clause must:
 a. have an operator-variable binding configuration; and
 b. the relative operator must c-command the clause corresponding to the predicate over which the λ -operator abstracts.

Thus, with this syntactic theory of relative clauses, only the representation in (46a) can be mapped semantically onto a λ -expression like the one in (46d), but not those in (46b) and (46c):

- (46) a. The man [who_i [John saw t_i]]
 b. *The man [John saw who]
 c. ?The man [Bill know [who_i [John saw t_i]]]
 d. λx(John saw x)

Only the representation in (46a) has an operator-variable binding configuration, and the relative operator c-commanding the clause that corresponds to the predicate over which the λ-operator abstracts. Failing to be mapped onto a λ-expression (in fact, they are not mapped onto anything semantically at all), the bracketed constituents in (46b) and (46c) will be uninterpretable, and the representations containing them would be ruled out by FI. Thus, the reason why relative operators must move is to create an representation which could then be translated semantically into a λ-expression. The difference between relative operators and interrogative pronouns would be that while the latter may remain in-situ in some cases, the former cannot. This is particularly clear in cases of multiple-*wh* questions:

- (47) a. Who bought what?
 b. John wondered who bought what?
- (48) a. ?The man [O [John wondered [who saw t]]]
 b. ?The man [who [John wondered [who saw t]]]

The obligatory movement of relative operators explains the less than the fully acceptable status of the examples in (48), a result of mild subjacency violations.

Before we proceed to discuss the distribution of relative operators, specifically, where they move to, let us consider some constructions involving resumptive pronouns in (Modern) Hebrew, since they appear to be *prima facie* counter-evidence to the claim that operator movement must occur.

5.4.3.2. Relative Operators in Hebrew Relative Clauses

Besides the possibility of having a gap in argument position, a resumptive pronoun is also possible in direct relativization (Borer (1984)), where the older form *?asher* is also possible (but only in the uppermost clause):

- (49) a. Ra'iti ?et ha-yeled she-/?asher rina ?ohevet *t*.
saw-I ACC the-boy that rina loves
'I saw the boy that Rina loves.'
b. Ra'iti ?et ha-yeled she-/?asher rina ?ohevet ?oto.
saw-I ACC the-boy that rina loves him
c. Ra'iti ?et ha-yeled she-/?asher ?oto rina ?ohevet.
saw-I ACC the-boy that rina him loves

What is striking is the fact that the resumptive pronoun *?oto* 'him' not only can appear in argument position as in (49b), it can also show up in a non-argument position (which is in COMP according Borer (1984)). It appears that it can only be an IP-adjoined position in current view of clause structure if *she-/?asher* is in C), as in (49c). Thus, if we take the resumptive pronoun as the counterpart of *wh*-relative pronouns in English (cf. the discussion of Borer's suggestion that the resumptive pronouns are operators below), then the examples in (49b) and (49c) would contradict the conditions on the syntactic form of relative clauses in (45b).

It turns out that the distribution of resumptive pronouns in Hebrew can be given an analysis according to which they are not operators, but simply are pronominal elements base-generated in argument positions and subsequently fronted, independently of movement. In sentences like those in (50), the pronoun *?oto* 'him' can appear in the same positions as in (49b) and (49c):

- (50) a. ?amarti le-kobi she-rina ?ohevet ?oto.
said-I to-Kobi that-Rina loves him
'I told Kobi that Rina loves him.'

- b. ?amarti le-kobi she-?oto rina ?ohevet.
 said-I to-Kobi that-him Rina loves
 'I told Kobi that it is him that Rina loves.'

The structure of relative clauses with a resumptive pronoun thus would be as something like (51), with *shel?asher* as a C°:

(51) NP [_{CP} O_i [*shel?asher* [_{IP} . . . pronoun_i . . .]]]

That is, the relative operator is base-generated in the Spec of CP, binding the pronoun in argument position⁴. No operator movement is involved in constructions with resumptive pronouns (Borer (1984)). In cases where the pronoun is not in its base-position as in (49b), we can assume that it has been fronted by whatever process that is responsible for the possibility in (50b) as well as that in (52b), independently of *Wh*-movement:

- (52) a. ?amarti le-kobi she-shalaxti ?eleyhem ?et david.
 said-I to-Kobi that send-I to-them ACC David
 'I told Kobi that I send David to them.'
 b. ?amarti le-kobi she-?et david shalaxti ?eleyhem.
 said-I to-Kobi that send-I ACC David to-them
 'I told Kobi that it is David that I send to them.'

That there is an empty operator in a non-argument position is further evidenced by constructions involving parasitic gaps. The contrast observed in the pair of English examples in (53) is also detectable in Hebrew to some extent:

- (53) a. Which paper did you file without reading?

⁴The structure in (51) is a variant of the suggestion in Sells (1984), who suggests that *she* is actually the operator binding in the pronoun. The problem with this idea is that more than one *she* can appear in relative clauses with embedded clauses (Borer (1984)):

- (i) ra?iti ?et he-yeled she-/?asher dalya makira ?et ha-?isha she-?ohevet ?oto.
 saw-I ACC the-boy that Dalya knows ACC the woman that loves him
 'I saw the boy that Dalya knows the woman who loves him.'

If the topmost *she* is an operator, then we would have to assume that that in the lower clause is something else.

- b. *I filed every paper without reading.
- (54) a. Eyze ma'amar tiyakta bli likro?
 which paper filed-you without read
 'Which paper did you file without reading?'
- b. *Tiyakti kol ma'amar bli likro.
 filed-I every paper without read
 'I filed every paper without reading.'

Chomsky (1982) suggests that parasitic gaps must be licensed at S-structure by a trace that does not c-command it, and the structure of the example in (53a) would be as in (55a):

- (55) a. [_{CP} Which paper_i [did [_{IP} you file t_i
 [_{CP} O_j [without [_{IP} PRO reading t_j]]]]]]]
- b. *I filed every paper [_{CP} O_i [without [_{IP} PRO reading t_j]]]

That is, the licensing gap is locally bound by the fronted *wh*-phrase, and the parasitic gap is locally bound by an empty operator. The ungrammaticality of the sentence in (53b) is explained by the fact that the quantifier *every paper* does not raise until LF. There would thus be no licensing gap for the parasitic gap at S-structure. In a similar manner, the structures of the examples in (54) would be those in (56) (categorical labels are irrelevant here, and are omitted):

- (56) a. Eyze ma'amar_i tiyakta t_i [O_j [bli likro t_j]]
- b. *Tiyakti kol ma'amar [O_j [bli likro t_j]]

The ungrammaticality of the example in (56b) would have the same explanation as that for (55b). Consider now the structure for a relativized noun phrase in (57):

- (57) The paper [_{CP} O_i [that [_{IP} you filed t_i [_{CP} O_j [without [_{IP} PRO reading t_j]]]]]]]

The grammaticality of the example in (57) with a parasitic gap thus suggests that there must be a licensing gap, and that the licensing gap is locally bound by an operator, as

indicated in the structure in (57). The Hebrew counterpart of this example in (57) is also acceptable, with a resumptive pronoun as the licensing gap⁵:

- (58) a. Hama'amar she-tiyakta ?oto bli likro?
 the-paper that filed-I it without read it
 'The paper that I filed without reading'
 b. Hama'amar [O_i [she-tiyakta ?oto_i [O_j [bli likro t_j]]]]

Since the parasitic gap is possible, it must then be the case that it is licensed by a gap that is locally bound by an operator, as the structure in (58b) shows. The relevant point here is that in constructions involving a resumptive pronoun, there is two operators, one locally binding the licensing gap, and one locally binding the parasitic gap.

On the basis of facts about inversion, Borer (1984) argues that the resumptive pronoun is a (pronoun) operator. She points out that when a resumptive is fronted to a pre-IP position, the subject and the verb may optionally appear in the opposite order. The resumptive pronoun ?oto 'him' is fronted to the most deeply embedded clause in the examples in (59b) (59c), and to the intermediate clause in (59d)-(59e):

- (59) a. Ha-?ish she-/?asher xana ?amra she-dalya ma?amina she-kobi pagash ?oto
 the-man that Xana said that-Dalya believes that Kobi met him
 'The man that Xana said that Dalya believes that Kobi met'
 b. Ha-?ish she-/?asher xana ?amra
 the-man that Xana said
 she-dalya ma?amina she-?oto_i kobi pagash t_i
 that-him Dalya believes that-him Kobi met
 c. Ha-?ish she-/?asher xana ?amra she-dalya ma?amina
 the-man that Xana said
 she-?oto_i pagash kobi t_i
 that-him Dalya believes that-him met Kobi

⁵In (58), it is also possible to have a trace instead of a resumptive pronoun as the licensing gap, and a resumptive pronoun instead of a trace as the parasitic gap.

- d. Ha-ʔish she-/ʔasher xana ʔamra
 the-man that Xana said
 she-ʔoto_i dalya maʔamina she-kobi pagash *t*_i
 that-him Dalya believes that Kobi met
- e. Ha-ʔish she-/ʔasher xana ʔamra
 the-man that Xana said
 she-ʔoto_i maʔamina dalya she-kobi pagash *t*_i
 that-him believes Dalya that Kobi met

More crucially is the fact that in the topmost CP, inversion may occur without the presence of the resumptive pronoun:

- (60) a. Ha-ʔish she-/ʔasher ʔoto_i xana ʔamra
 the-man that-him Xana said
 she-dalya maʔamina she-kobi pagash *t*_i
 that Dalya believes that Kobi met
- b. Ha-ʔish she-/ʔasher ʔoto_i ʔamra xana
 the-man that-him said Xana
 she-dalya maʔamina she-kobi pagash *t*_i
 that-Dalya believes that Kobi met
- c. Ha-ʔish she-/ʔasher ʔamra xana
 the-man that-him said Xana
 she-dalya maʔamina she-kobi pagash *t*
 that-Dalya believes that Kobi met

Borer argues that the inversion is possible only if it is triggered by the presence of the resumptive pronoun functioning as an operator, and that cases like (60c) are instances where the resumptive has been fronted, as in (60a), triggering inversion as in (60b), and then deleted at PF. (The trace of the fronted pronoun would still be bound at LF). If her contention is correct, then we would have counter-evidence to the claim that relative operators may not stay in their base-position, and that they do not move part-way (cf. section 3.2.2.2 on West Flemish *die*).

However, it seems that inversion facts can be accommodated in the analysis I suggested, with an empty operator base-generated in [SPEC, CP]. Inversion can be assumed to be triggered by the presence of the fronted resumptive pronoun, just like Borer sug-

gests, but without the assumption that the resumptive pronoun is an operator. In fact, there is some evidence showing that inversion has nothing to do with operator movement. The grammaticality of the declarative sentences in (61b) and (61c) shows that inversion may occur without operator movement:

- (61) a. ?arie taraf yeled ?etmol be-gan ha-xayot.
 lion devoured boy yesterday in-the-zoo
 'A lion devoured a boy yesterday in the zoo.'
 b. ?etmol be-gan ha-xayot taraf ?arye yeled
 yesterday in-the-zoo devoured lion boy
 c. ?et ha-yeled taraf ha-?arie ?etmol be-gan ha-xayot
 ACC the-boy devoured the-lion yesterday in-the-zoo

Moreover, that there is no (overt or abstract) operator movement involved in relative clauses with a resumptive pronoun is further supported by the fact that pronoun fronting obeys subjacency:

- (62) a. Ze ha-sefer she-/?asher ra?iti /et ha-?ish she-/?asher katav ?oto.
 this the-book that saw-I ACC the man that wrote it
 'This is the book that I saw the man who wrote it.'
 b. *Ze ha-sefer she-/?asher ?oto, ra?iti ?et ha-?ish she-/?asher katav t_i .
 this the-book that it saw-I ACC the man that wrote

Thus, if resumptive pronouns are operators, then we should expect the example in (62a) to be impossible, contrary to fact. Therefore, facts about Hebrew relative clauses and inversion do not constitute counter-evidence to the claim that relative operators may not stay in-situ and that they may not move part-way.

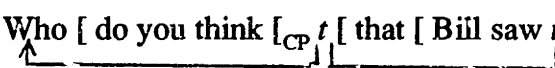
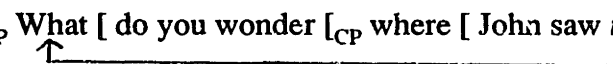
There are some issues that it is not clear how they are to be resolved, however. Although the data on English relative clauses suggest that some sort of operator movement is involved in these constructions, but it is very unclear why it must occur at S-structure. If the function of operator movement is related to predication theory, a reasonable place that we would expect it to occur would be at LF. Yet, the facts seem to indicate that it is not. The data in Hebrew also suggest that operator-variable binding relations in relative

clauses must be established at S-structure, even though there is an option of having no operator movement in this language. Again, it is not clear why it may not be established at LF. Another issue is that the parametric difference between English and Hebrew. Why is the option of having a resumptive pronoun only marginally possible in English?

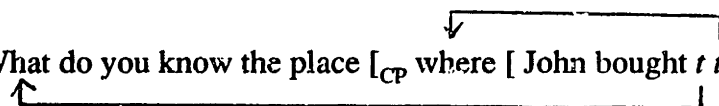
For our concerns of proper government in relative clauses, however, it is immaterial whether the movement is at S-structure or at LF. The trace left behind by movement at S-structure or at LF is subject to the ECP in any event. We now turn to the distribution of relative operators, since it is not immediately clear where the empty operator moves to in zero-relatives, given that it has no phonetic matrix.

5.4.3.3. The Distribution of *Wh*-operators

In interrogatives, it seems clear that we have motivation for assuming that *wh*-phrases occur at S-structure either in the base-position or in the Spec of CP (except of course they may move to [SPEC, IP] for Case reasons), namely, they induce *wh*-island effect. If we adopt the idea that *wh*-movement is successive-cyclic through the Specs of CPs (Chomsky (1973, 1977)), then the contrast in (63) is expected. Whereas there is an escape hatch in (63a) for movement of the *wh*-phrase *who*, no such position is available in (63b).

- (63) a. $[_{CP} \text{Who } [_{\text{do you think } [_{CP} t \text{ [that [Bill saw } t \text{]}}]]]]?$

 b. $??[_{CP} \text{What } [_{\text{do you wonder } [_{CP} \text{where [John saw } t \text{]}}]]]]?$


In relative clauses, the effect is more indirect. Extraction out of relative clauses is impossible because of Huang's (1982) CED. It is therefore not possible to show that the relative pronoun lands in the Spec of CP as its final resting place, and thus occupies the escape hatch for extraction of other *wh*-phrase. That is, the ungrammaticality of the example in (64) can be ruled out independently by the CED:

- (64) $*\text{What do you know the place } [_{CP} \text{where [John bought } t \text{]}]$


Since the ungrammaticality of (64) is more severe than a weak subjacency violation, as that in (65):

(65) ??What did you wonder [_{CP} where [John bought *t t*]]

Hence, we cannot appeal to subjacency to rule out the example in (64).

For sure, *wh*-operators move through the Specs of CPs. In fact, if we assume that they may stay there, the *wh*-island effects can thus be accounted for:

(66) a. *?The man [_{CP} who [John wondered [_{CP} where [John saw *t t*]]]]

b. *?The book [_{CP} which [John asked Mary [_{CP} who [John gave *t t*]]]]

In this respect, *wh*-phrases in general, whether they appear in interrogatives or relative clauses, can be taken to occur in Specs of CPs in addition to their base-positions (we will slightly modify this in section 5.7.3), and there appears to be no particular reason why we should assume that they can occur in other positions.

5.4.3.4. The Distribution of Empty Operators

In *that*-relatives, however, there are no overt relative pronouns. If we adopt an analysis of relative clauses along the lines of Chomsky (1977, 1982) where there is an empty operator moving from the base-position, then we can take empty operators as the null counterparts of the overt *wh*-operators, except that, in English, unlike overt *wh*-operators, empty operators can appear in the Spec of CP headed by the complementizer *that* (cf. Chomsky and Lasnik (1977) Doubly-filled COMP Filter). This is illustrated in (67):

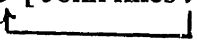
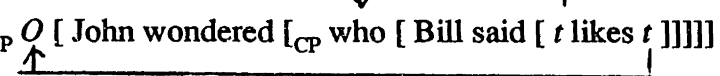
(67) a. *The man [_{CP} who [that [John saw *t*]]

b. The man [_{CP} *O* [that [John saw *t*]]

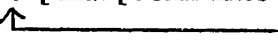
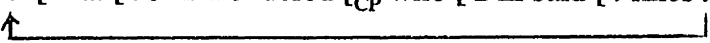
c. $\lambda x(\text{John saw } x)$

According to our assumption about the relation between the syntactic form of a relative clause and the λ -expression to which it is mapped onto, the bracketed CP in (67b) is well-formed. It has an operator-variable binding configuration in which the relative operator c-commands the clause corresponding to the predicate over which the λ -operator abstracts, given in (67c).

The original motivation for positing movement of empty operators is to account for island effects exhibited in constructions without overt operators (Chomsky (1977)), as the grammatical contrast in (68) shows:

- (68) a. This book, [_{CP} *O* [John likes *t*]]

 b. ??This book, [_{CP} *O* [John wondered [_{CP} who [Bill said [*t* likes *t*]]]]]]


A subadjacency violation occurs in the example in (68b), since the escape hatch [SPEC, CP] in the intermediate clause in (68b) occupied by a *wh*-phrase prevents the empty operator from making a transition. The same effect is observed in relative clauses:

- (69) a. The book [_{CP} *O* [that [John likes *t*]]]

 b. ??The book [_{CP} *O* [that [John wondered [_{CP} who [Bill said [*t* likes *t*]]]]]]]]


The same reason explaining the ungrammaticality of the example in (68b) can also be given for the example in (69b). That is, empty operators behave like overt *wh*-operators in that they also move through the Spec of CP. However, it is much less clear where the empty operators land eventually. Since they are phonetically null, direct evidence for the landing site is very difficult to obtain.

Notice that the other function of the empty operators is that they serve to create a

syntactically legitimate relative clause, which is later mapped onto a semantic representation, a λ -expression. More specifically, the function of empty operators in these constructions is then to create an operator-variable binding configuration, very much like that of quantifiers. If this is so, then it seems natural to assimilate the syntax of empty operators to that of quantifiers with respect to the landing site. That is, both empty operators and quantifiers are licensed in an IP-adjoined position:

- (70) a. John saw everyone.
 b. LF: $[_{IP} \text{everyone}_i [_{IP} \text{John saw } t_i]]$
- (71) a. The man John saw
 b. LF: The man $[_{IP} O_i [_{IP} \text{John saw } t_i]]$

As far as syntactic theory of relative clauses is concerned, the IP in (70b) is well-formed. It has an operator-variable binding configuration with the relative operator c-commanding the clause corresponding to the predicate over which λ -operator abstracts (cf. (67c)). It seems that no principles or constraints in the grammar are violated under the assumption that the relative clause in (71b) is an IP; nor are there principles and constraints requiring that it be a CP (with an empty head-position). That is, in the general case, without further stipulation, either an IP or CP with an empty head-position may be a legitimate form of a relative clause:

- (72) a. NP $[_{CP} O_i [\emptyset [_{IP} t_i \dots]]]$
 b. NP $[_{IP} O_i [_{IP} t_i \dots]]$


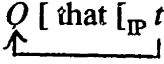
If we assume some version of the Principle of Economy of Representation along the lines in (73):

- (73) If two representations have the same surface form, and serve the same function, then the representation that has fewer categorial projections is to be chosen as the syntactic representation serving that function.

The principle in (73) would thus require that the representation in (72b) be chosen over that in (72a) as the representation of an NP modified by a relative clause with no overt complementizer. This is because both representations have the same surface form that conform to syntactic theory of relative clauses, and both can serve the same function, namely, to create a semantic predicate. They both have an operator-variable binding configuration with the relative operator c-commanding the clause corresponding to the predicate over which the λ -operator abstracts. They can thus be mapped onto the same λ -expression.

However, the representation in (72b) is more economical than that in (72a). Whereas the representation in (72b) has two segments of a single IP-projection, that in (72a) has a CP-projection in addition to the IP-projection. If this is correct, then the ungrammatical example (70a) cannot have as the modifying relative clause a CP with an empty head-position, with an empty operator subsequently moving from the Spec of IP to the Spec of CP, as indicated in (70a). The relative clause must instead be an IP with the empty operator adjoining to IP.

With the possibility that an empty operator may adjoin to IP, we might wonder if the IP in the example in (74a) is just as well-formed as that in the example in (74b):

- (74) a. The man [_{CP} that [_{IP} O [_{IP} t saw John]]]

- b. The man [_{CP} O [that [_{IP} t saw John]]]

- c. $\lambda x(x \text{ saw John})$

Recall from section 1.6.2 that a predication relation holds of two constituents only if a mutual c-command relation holds. What that means is that the CP is the predicate predicated of the relative head *man*, not the IP. The CP c-commands the relative head, but the IP does not. The CP in (74a) does not have the requisite form of a relative clause, however. Although it has an operator-variable binding configuration, the relative

operator does not c-command the clause corresponding to the predicate over which the λ -operator abstracts. On the contrary, the CP in (74b) has both of these requirements. Hence, it is a syntactically well-formed relative clause.

5.4.3.5. The Predicate Principle

In a *wh*-relative like the one in (75), there is no overt lexical item in the head position of the CP. It is not unreasonable to assume that there is simply nothing filling that position, indicated as *e* in the representation:

(75) The man [_{CP} who [*e* [_{IP} John saw *t*]]]

Compare the CP in (75) with the one in (68), which is a complement clause:

(76) Mary wondered [_{CP} who [*e* [_{IP} John saw *t*]]]

With respect to X'-theory, a CP with like the embedded clause in (76) is well-formed, since lexical insertion is generally assumed to be optional. A sentence like the one in (77) is ruled out as ungrammatical by general principles and constraints of the grammar:

(77) *Bill must [_{VP} *e* a book]

The sentence is impossible since it violates the Theta-Criterion. The subject *Bill* and the object *a book* do not have a θ -role, even though X'-theoretically, the structure is well-formed.

Carrying over the same lines of reasoning, a relative clause with an empty head-position as that in (75) should also conform to the X'-schemata, just like its counterpart in (76). This would mean that the predicate predicated of the relative head *man* has an empty head. Now, suppose Kayne (1982) is correct in that there is a connection between verbs and predicates on the one hand, and between nouns and arguments on the other, and that there is some truth to Holmberg's (1986) and Taraldsen's (1986a) idea that


predicates must be a projection headed by a [+V] category. In other words, there is some principle along the lines of (78) (from Holmberg (1986))⁶:

(78) The Predicate Principle:

A predicate must be headed by [+V] head.

In fact, when we look at typical predicates like verbs and adjectives, they all have a [+V] head. Thus, if we adopt the Predicate Principle, then there must be abstract verb movement in the CP in (75), to provide the projection with a [+V] category and turn the CP into a predicate:

(79) The man [_{CP} who_i [saw [_{IP} John t t_i]]]

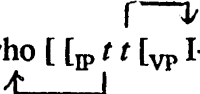


If abstract verb movement does not occur, and the S-structure representation in (75) stays as it is at LF, then the CP would fail to be a predicated of anything. Since it does not contribute to the semantics of the example in some other way; therefore, it would make no contribution to the semantics of the example. Neither can it delete, since it contains semantically significant lexical items. The CP would then be superfluous, and be ruled out by FI. If this is correct, then we have independent reason to assume abstract verb movement to C in relative clauses, which has consequences for theory of proper government as we will see in section 5.5.

Let us now return to the example in (79), repeated here as (80a), and its S-structure, LF and semantic representations as given in (80b-c):

(80) a. The man who saw John

b. S-structure: The man [_{CP} who [[_{IP} t t [_{VP} I+saw John]]]]



⁶It seems that we have to generalize the Predicate Principle to cover cases of predicate nominals like (i):

(i) John is a man.

I will not pursue the matter further here.

- c. LF: The man [_{CP} who_i [[_{IP} t_i saw [_{VP} t John]]]]
- d. Semantics: $\lambda x(x \text{ saw John})$

Before the finite verb moves to C, there is simply no [+V] head. The CP-adjunct in thus fails to function as a predicate. But what about the IP which has the verb in INFL, the head-position of the IP? Can it function as a predicate at LF? The answer is no. This is because it does not have the syntactic form of a predicate. In particular, it does not have a configuration of operator-variable binding. The *wh*-operator is outside the IP. In addition, the theory of predication requires that a mutual c-command relation hold in a subject-predicate relation. In (80), the IP does not c-command the relative head *man*, hence the subject-predicate relation does not hold between the two. In short, both the CP and the IP in (80) cannot function as predicates. Failing to be predicated of anything, both the CP and IP would fail to have an appropriate interpretation. Again, we certainly cannot just delete them since they contain lexical categories with semantic content and syntactic features. The resulting structure in (80c) thus violates FI.

The only way for the structure in (80c) to be well-formed is to have the finite verb move to the empty head-position of the CP at LF, providing it with a [+V] head as in (81a):

- (81) LF: The man [_{CP} who_i [saw [_{IP} t_i t John]]]

The CP can now function as a predicate: it has a [+V] head, a configuration of operator-variable binding, and the relative operator c-commands the clause corresponding to the predicate over which the λ -operator abstracts.

Notice that the LF-representation in (79), a case of object relativization, and that in (81), a case of subject relativization, are very similar. However, the indices indicating the relationships between the extraction sites and the landing sites clearly show that they are in fact different representations.

5.5. Head-government in Relative Clauses

With a theory of predication as discussed in the last section, we are now ready to give an account of the grammatical patterns exhibited in constructions involving short subject extraction in relative clauses.

5.5.1. *Wh*-relatives

Consider first operator-movement in a relative clause like that in (82a):

- (82) a. The man who saw John
- b. The man $[_{CP} \text{ who } [_{IP} t \text{ } [_{VP} \text{ I+saw John }]]]$
- c. LF verb-movement to I: The man $[_{CP} \text{ who}_i \text{ } [_{IP} t_i \text{ saw } [_{VP} t \text{ John }]]]$
- d. LF verb-movement to C: The man $[_{CP} \text{ who}_i \text{ } [_{C} \text{ saw } [_{IP} t_i t \text{ John }]]]$
- e. Semantics: $\lambda x(x \text{ saw John})$

By predication theory, the *wh*-operator must move to [SPEC, CP] at S-structure. Consider next verb movement. Recall that INFL lowers to V in a language like English. Therefore, the S-structure representation of a relativized noun phrase like the one in (82a) would be something like (82b). At LF, in order to eliminate the illegitimate chain (t_1 , I+saw) created by I-lowering, the V+I complex must raise back to INFL, as in (82c). Again, by predication theory according to which the head of the relative clause must be lexically filled, verb movement to C must take place, as in (82d). The CP would then be a syntactically well-formed predicate. It has a configuration of operator-variable binding with an operator *c*-commanding the clause corresponding to the predicate over which the λ -operator abstracts, which is given in (82e). In addition, the CP has a lexically filled head, namely, the finite verb *saw*. It is clear from the representation in (82d) that the subject trace t in (C1) is now head-governed by the finite verb *saw* in C. In addition, it is also antecedent-governed by the *wh*-operator *who*, the ECP is thus satisfied. Let us now consider head-government in zeros-relatives.

5.5.2. Zero-relatives

Before turning for the structure of zero-relatives, let us first see what issues in theory of proper government are involved with respect to the distribution of overt *wh*- and empty operators, if we were to assume that empty operators are simply like *wh*-operators except for the phonetic matrix.


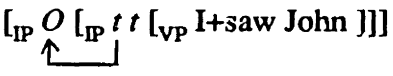
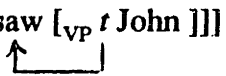
If empty operators behave exactly like overt *wh*-operators, then the structures involving these two operators would be exactly the same. We would then have no reason to expect a grammatical contrast between the example in (83) and that in (84):

- (83) a. S-structure: The man [_{CP} who [_{IP} \emptyset t saw John]]
- ↑
- b. LF verb-movement: The man [_{CP} who_i [_{IP} t_i t John]]
- ↑
- (84) a. S-structure: The man [_{CP} O [_{IP} t saw John]]
- ↑
- b. LF verb-movement: The man [_{CP} O_i [_{IP} t_i t John]]
- ↑

The LF-representation in (84b) should be just as well-formed as that in (83b). On the one hand, we cannot really claim that it is the intrinsic nature of the operators that is responsible for the grammatical difference. Specifically, we cannot claim that the overt operators can, but the empty operators cannot, transfer their features or indices to the finite verb in the C position, thus turning the verb into a proper governor. We have seen why such an analysis would not work in section 5.3. On the other hand, the LF-representation in (61d) for the grammatical example (61a) is exactly like that in (84b). It is simply contradictory to assume the same LF-representation for two surface forms that have different grammatical status: that in (61a) is good, but the one in (84b) is bad.

The theory of predication that we outline in the last section now comes into play. According to the conclusion that we reached there regarding the distribution of operators in

relative clauses, the legitimate structure for the example in (84a), repeated as in (85a), must be as in (85b), not as in (84b):

- (85) a. *The man saw John 
- b. S-structure: The man $[_{IP} O [_{IP} t t [_{VP} I+saw\ John]]]$ 
- c. No verb movement to C at LF: The man $[_{IP} O_i [_{IP} t_i\ saw\ [_{VP} t\ John]]]$ 
- d. $\lambda x(\text{John saw } x)$

That is, the empty operator is licensed in an IP-adjoined position (in addition to the Spec of the complementizer *that*). At LF, the finite verb *saw* must raise back to INFL for the familiar two reasons: (i) to eliminate the illegitimate chain ($t_1, I+saw$) created by I-lowering at S-structure; and (ii) to provide a lexical head for the IP relative clause to function semantically as a predicate. Again, as far as theory of predication is concerned, the IP in (85c) is a legitimate syntactic structure for a predicate. It has an operator-variable binding configuration with the relative operator c-commanding the clause that corresponds to the predicate over which the λ -operator abstracts. The IP also has a [+V] head, namely, the finite verb in INFL, the head of the IP.

However, with respect to theory of proper government, the subject trace is not properly governed. Although it is antecedent-governed by the empty operator in the IP-adjoined position, there is no head-governor around to head-govern it. The reason is that there is simply no head-position for the verb to raise to. It is noteworthy that the Principle of Last Resort would also prevent verb movement in (85), had it been possible for it to adjoin to a maximal projection (cf. Kayne (1990)). In the representation given in (85c), every LF-object is already legitimate. We have a well-formed semantic predicate (i.e. the relative clause), and a well-formed operator-variable chain. Hence, no changes in the representation is allowed.

In any event, one way or another, either because there is no head-position, or because

no movement is allowed, the representation in (85c) with the verb in INFL would not properly head-govern the subject trace, violating the ECP. Again, it seems that the conjunctive formulation of proper government gives the correct result, but the disjunctive formulation would incorrectly predict that the LF-representation in (85c) is well-formed. Head-government is not required in the latter formulation if antecedent-government obtains.

5.5.3. *That*-relatives

Recall our assumption that complementizers like *that* are expletives. Thus, they must be removed in accordance with FI. Since *that* in English bears no ϕ -features, it can delete. After operator movement and verb movement at S-structure analogous to the case of *wh*-relatives discussed in the last section, an S-structure representation obtains as in (86b) for a *that*-relative like the one in (86a):

- (86) a. The man that saw John
 b. S-structure: The man [_{CP} *O* [that [_{IP} *t* saw John]]]
 c. LF-deletion: The man [_{CP} *O*_i [\emptyset [_{IP} *t*_i saw John]]]
 d. LF verb-movement to C: The man [_{CP} *O*_i [saw [_{IP} *t*_i *t* John]]]
 e. Semantics: $\lambda x(x \text{ saw John})$

At LF, *that* deletes, as in (86c). The finite verb *saw*, now in INFL, must move up to the vacated C position, to provide the CP with a [+V] head. The CP in (86d) is a syntactically well-formed predicate according to theory of predication. Just like the case in (82d), the CP in (86d) has a operator-variable binding configuration, and the relative operator c-commands the clause corresponding to the predicate over which the λ -operator abstracts, given in (86e). In addition, the CP has a lexically filled head. With the finite verb *saw* in the C position, we have the desirable consequence in that the subject trace is now head-governed. It is also antecedent-governed by the empty operator *O*, and the ECP is thus satisfied, the correct result.

5.6. The *That*-Trace Effect versus the Anti-*That*-Trace Effect

It has long been noticed since at least Chomsky and Lasnik (1977) that the grammaticalities of the *that*-trace sequence in relative clauses and complement clauses are different. It is good in relatives (the anti-*that*-trace effect), but bad in complements (the *that*-trace effect):

- (87) a. The man $[_{CP} O [\text{that } [_{IP} t \text{ left }]]]$
 ↑
 └──────────┘
- b. *Who do you think $[_{CP} t [\text{that } [_{IP} t \text{ left }]]]$
 ↑ ↑
 └──────────┘ └──────────┘

What is all the more interesting is that the absence of the complementizer *that* is good in complements, but bad in relatives:

- (88) a. Who do you think $[_{IP} t \text{ left }]]$
 ↑
 └──────────┘
- b. *The man $[_{IP} O [\text{that } [_{IP} t \text{ left }]]]$
 ↑
 └───┘

In section 5.5.3, we saw why the the example in (87a) is grammatical. The fact that the example in (88b) is impossible was explained in section 5.5.2. In this section, we will discuss the issue whether the complementizer *that* in these two constructions are one and the same, and consider some proposals and examine some of the issues involved in light of recent development in linguistic theory. I will argue that the most satisfactory account of the grammatical difference in the *that*-trace effect and the anti-*that*-trace effect is in terms of motivation for verb movement. Whereas there is motivation for abstract verb movement to C in relatives, as we saw in the previous several sections, the Principle of Last Resort would prevent verb movement in complements.

5.6.1. The *That*-Trace Filter

Chomsky and Lasnik (1977) suggest that a *That*-trace Filter, given in (89), though applicable to rule out a *that*-trace sequence in a complement clause like that in (87b), includes conditions that specifically prevent the filter from applying to the *that*-trace sequence in a relative clause like that in (89a):

(89) The *that*-trace Filter

*[_{S'} that [_{NP} e] ...]

Unless S' or its trace is in the context [_{NP} NP ____ . . .]

The intuition behind the *unless*-clause of the *that*-trace filter is to treat the *that*-trace sequence in relative clauses differently from that in complement clauses, even though superficially, they have an almost identical structure (the relevant portion of the structures is of course the bracketed S' (=CP). The structure in (87b) has a trace, whereas the one in (87a) has an empty operator in the Spec of CP.

Besides the fact that empirically that the *that*-trace Filter would incorrectly disallow the grammatical example in (90), as Koopman (1981, 1983a) points out:

(90) [_{CP} Who [did [_{IP} John see t]]]
 ↑
 └──────────────────┘

Chomsky (1980, 1981) argues that filters of the sort given in (89) is stipulative and ad hoc, which should be eliminated from the grammar. We should also note here that the exploitation of the difference between a trace and an empty operator in the Spec of the complementizer *that* is simply a variant of the filter, namely, a restatement of the fact. In what follows, we will discuss several possibilities of accounting for the *that*-effect in complement clauses, and the anti-*that*-trace effect in relative clauses, without appealing filters.

The first possibility is that the complementizer *that* in relative clauses and that in the

complement clauses are not the same entity. There are various ways we can make the difference precise. For instance, we might say that the complementizer in relative clauses is a proper governor, but that in complement clauses is not. We certainly should not rule out this possibility out of hand, but if they are different entities, then it would seem to be pure co-incident that both of them have the same phonetic matrix, and occupy the same position, namely, the head-position of the CP. In addition, there seems to be no independent way to justify the claim that the complementizer *that* in relative clauses differs from that in complement clauses, since they differ in exactly one respect: head-government. For this reason, we will not explore and comment further on this possibility. Instead, we will consider some other alternatives according to which the complementizer *that* is one and the same in both complements and relatives.

5.6.2. Minimality in Relative Clauses

We have discussed the Minimality approach to the *that*-trace effect in section 4.2. Apart from the problems pointed out there, this approach cannot be made to work for the anti-*that*-trace effect in relative clauses. Under this approach, the ungrammaticality of the *that*-trace effect is attributed to the failure of antecedent-government of the subject trace in [SPEC, IP] by the intermediate trace in [SPEC, CP]. Since the same relationship obtains in a *that*-trace sequence in relative clauses, Minimality would also rule out, incorrectly, the grammatical anti-*that*-trace effect.

5.6.3. Relative *That* as an Agreeing Complementizer

A slightly different alternative, which we might term the agreeing complementizer approach, is that there are some interactions among the complementizer *that* and the co-occurring elements in relatives, but the interactions are lacking in complements, in such a way that the complementizer *that* in relative clauses, but not the one in complement clauses, acquires some agreement features. As a result, proper government of the original trace in argument position obtains in relative clauses, but not in complement clauses. The issue now is what precisely are the interactions, and to the extent that the

ungrammaticality of short subject extraction in zero-relatives has some bearing on the ECP, how the connection between these interactions and theory of proper government is to be drawn.

One possibility that immediately comes to mind is Pesetsky's (1982) COMP-contraction Rule for *that*-relatives. Let us first remind ourselves of his account of the lack of the *that*-trace effect in relatives. According to Pesetsky, the form of the COMP-contraction rule is in (91):

$$(91) \text{ [}_{\text{COMP}} \text{ WH}_i \text{ complementizer]} \rightarrow \text{ [}_{\text{COMP}} \text{ complementizer}_i \text{]}$$

The rule in (91) has two effects. First, it copies the index of the *wh*-phrase onto the complementizer. Second, it eliminates the *wh*-phrase. As a result, the complementizer will c-command everything dominated by COMP, since COMP is not branching in this case.

In Pesetsky's (1982) account, the *that*-trace effect is subsumed under Chomsky's (1980) Nominative Island Constraint (NIC), which says that nominative-marked traces must be bound in S' (=CP). Thus, the example in (D2) is ungrammatical because the nominative trace in the embedded clause is not bound within the embedded CP. In the earlier view of clause structure with only one position for both complementizers and *wh*-phrases, namely, COMP, the structure of (D2) would be something like (92):

$$(92) \text{ *Who do you think [}_{S'} \text{ [}_{\text{COMP}} t \text{ that] [}_{S'} t \text{ left]]?}$$

Since with the trace in COMP, the structure in (92) does not meet the structural description of the COMP-contraction Rule, no index-copying occurs. The trace in the branching COMP in (92) does not c-command the original trace in argument position (Kayne (1981b)); therefore, the former fails to bind the latter. The NIC is thus violated.

However, in an example like that in (93a) where a *wh*-phrase moves to COMP, the COMP-contraction Rule applies, copying the index of the *wh*-phrase onto the complementizer. The example in (D3) would have the representation as in (93b) after the application of the COMP-contraction Rule:

- (93) a. *Wh*-movement: The man [_{S'} [_{COMP} *who*_i *that*] [_S *t*_i liked spinach]]
- b. COMP-contraction Rule applies:
 The man [_{S'} [_{COMP} *that*_i] [_S *t*_i liked spinach]]
 [+NOM]

The example in (93b) is grammatical because the subject trace is bound by the complementizer *that* by virtue of being c-commanded by the complementizer with the same index⁷.

Notice that the formulation of the COMP-contraction Rule explicitly mentions the presence of a *wh*-phrase in its structural description. It thus can distinguish the *that*-trace sequence in complement clauses from that in relative clauses. We thus need not assume that the complementizer in relatives and complements are different entities. The grammatical difference between the two cases is to be accounted for in the way the COMP-Contract Rule works.

To make the COMP-contract Rule compatible with current theoretical assumptions, especially, under the current view of clause structure according to which there are two different positions for complementizers and *wh*-phrases, some adjustments are called for. One possibility is along lines of Lasnik and Saito's (1989). Instead of the COMP-contraction Rule as stated in (91), we have Spec-head agreement in CP. That is, when an

⁷The binding of the trace by the complementizer *that* in (93b) implies that one of the following two assumptions must be made: (i) if *that* is of the category C, then we must allow binding of elements having a different category than the binder; (ii) if only binding of elements of the same category is allowed, then *that* must be of the same category as that of the trace (either DP or NP, depending on one's assumption about nominal projections). It is not clear how *that* is licensed with respect to Theta theory if the assumption (ii) is made.

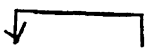
empty operator moves into the Spec of the complementizer *that* in relatives, Spec-head agreement obtains, and by that virtue, the complementizer *that* comes to have the same index as that of the empty operator:

(94) The man [O_i [*that*_{*i*} [t_i left]]]

The complementizer *that* in (94) can thus head-govern the original trace in argument position⁸. We need some elaboration of Spec-head agreement in CP in order to make the necessary distinction between the *that*-trace sequence in relatives and complements, however.

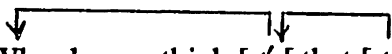
Lasnik and Saito suggest that operators quite generally have the feature [−WH], which the complementizer *that* also has, but traces crucially lack the WH-feature altogether. Spec-head agreement in CP can take place only if the element in the Spec and the head C both have the same WH-feature. In (94), since both the empty operator and the complementizer *that* have the feature [−WH], Spec-head agreement is possible. Consequently, the complementizer *that* has the same index as that of the empty operator, by transitivity:

(95) The man [O [*that*_{*i*} [t left]]]
 [−WH] [−WH]



In complement clauses, however, the trace lacks the WH-feature, but the C dominating *that* is [−WH]; hence, no Spec-head agreement is possible between the trace in the Spec of CP and the complementizer *that*:

(96) *Who do you think [t' [*that* [t left]]] ?
 [−WH]



⁸In fact, for Lasnik and Saito, *that* antecedent-governs the subject trace in (94). For them, only antecedent-government is at issue, and only X⁰'s can be antecedent-governors. This distinction is not particularly crucial for our discussion here, however.


As a result, the complementizer *that* does not have the same index as that of the original trace in argument position. The representation would contain a trace without a governor, violating the ECP.

Lasnik and Saito's account can also explain why short subject zero-relatives is impossible. They suggest that when there is no overt complementizer occupying the C position, the C node lacks the WH-feature altogether. Hence, the empty operator, which is [-WH], is unable to copy its index to C°:

(97) The man [_{CP} O_i [C° [_{IP} t_i left]]]

As a result, C° fails to (antecedent) govern the subject trace. It follows from the ECP that the complementizer *that* is required, as in (94).

Unfortunately, Lasnik and Saito's modified version of Pesetsky's COMP-contraction Rule, as well as Pesetsky's original proposal itself, are not readily carried over to analyses that crucially assume the conjunctive formulation of proper government. Consider the structure of a *wh*-relative like that in (98):

(98) The man [who [C° [t left]]]


Now, if the C° in (98) and that in (97) is one and the same, which has no WH-feature, then for the same reason that C° cannot get the index of the operator in (97) by Spec-head agreement, the C° in (98) should also not be able to have the index of the *wh*-operator. Therefore, the subject trace fails to be properly governed. In particular, it is not head-governed in our analysis. But the example is grammatical. Apparently, we have the wrong prediction for (98).

Turning now to the nature of the COMP-contraction Rule itself. Although the rule

works correctly for English, we need some adjustments in order to cover the fact regarding the French *que/qui* alternation. The adjusted rule would look something like (99), according to Pesetsky (1982):

$$(99) \quad \begin{array}{c} \text{WH}_i \\ \text{[}_{\text{COMP}} \text{ } \\ t_i \end{array} \text{ que]} \rightarrow \text{[}_{\text{COMP}} \text{ qui}_i \text{]} / \text{ ______ [x } \begin{array}{c} t_i \\ \text{[+NOM] y } \end{array}]$$

The disjunction in the structural description of the rule in (99) is designed to handle the *qui*-trace sequence in both relative clauses and complement clauses. Either a trace or a *wh*-phrase occurring next to the complementizer *que* would cause the complementizer to be spelled out as *qui* with have the same index:

$$(100) \quad \text{a. S-structure: Qui}_{t_i} \text{ crois-tu [[}_{\text{COMP}} t_i \text{ qui] [} t_i \text{ est venu]]?}$$

‘Who do you think came?’

b. COMP-contraction Rule:

$$\text{Qui}_{t_i} \text{ crois-tu [[}_{\text{COMP}} \text{ qui}_i \text{] [} t_i \text{ est venu]]?}$$

$$(101) \quad \text{a. S-structure: L'homme [qui}_{t_i} \text{ [tu crois [[}_{\text{COMP}} t_i \text{ qui] [} t_i \text{ est venu]]]]$$

‘The man who you think came’

b. COMP-contraction Rule:

$$\text{L'homme [qui}_{t_i} \text{ [tu crois [[}_{\text{COMP}} \text{ qui}_i \text{] [} t_i \text{ est venu]]]]$$

The difference between English and French with respect to the complementizer-trace sequence is that the English version of the COMP-contraction Rule lacks the specification of a *wh*-phrase appearing adjacent to the complementizer in COMP.

Again, empirically, the French version of the COMP-contraction rule works correctly in this language. However, conceptually, we might wonder about the explanatory value of such rules. In particular, it is not clear why the English and the French versions of the rule look so similar. Unless we have some constraint, presumably from UG, imposed on the format of rules involving COMP (for example, on locality, on the terms appearing in

the structural description, etc.), it seems quite difficult to explain why the rules should have the form that they have.

One other approach to the lack of the *that*-trace effect in relative clauses which crucially relies on the interactions of the co-occurring elements in these constructions is that suggested in Rizzi (1990a). As we saw in section 5.3, Rizzi proposes that the complementizer *that* in relatives may be turned into a proper (head-) governor, not by virtue of Spec-head agreement in CP, but by what Rizzi calls A-agreement. That is, agreement with an A-position. Under this view, in a noun phrase modified by a relative clause as in (101a), whose structure is given in (101b), there is not Spec-head agreement between an empty operator in the Spec of CP and C°:

(102) a. The man that saw John

A-agreement

┌──────────┐
b. The man [_{CP} O [that+AGR [_{IP} t saw John]]]

Instead, there is A-agreement between the complementizer *that* and the head of the relative. In this way, the complementizer *that* becomes a proper header governor, head-governing the original trace in argument position. The lack of the *that*-trace effect in relatives is thus accounted for.

For the *that*-trace sequence in complement clauses, A-agreement does not obtain. To see this, let us take a look at the familiar example in (103):

(103) *Who do you think [_{CP} t [that [_{IP} t left]]]?
↑──────────┐ ↑

In (103), the embedded CP is not a CP-adjunct as in the case of (102), but is a complement to the matrix verb *think*. At least the relationship between the *wh*-phrase *who* and

the complementizer *that* in the structure in (103) is not like the relationship between *that* and the relative head *man* in (102); Therefore, there is no A-agreement in (103), whatever A-agreement is. In addition, according to Rizzi, the complementizer *that* is inert for government. Lacking agreement features, it thus cannot act as a proper head governor in (103). The embedded subject trace thus lacks a head-governor, hence the ECP is violated.

Besides the issues that arise specifically in Rizzi's analysis of relative clause that we raised there, approaches to the lack of the *that*-trace effect in relative clause by appealing to complementizers in one way or another acquiring features, and thus becoming a proper head governors, would lead us to maintain one or more of the following assumptions, depending on the particular technical details we adopt. But it appears that none of them has independent justification. First, if we must assume Spec-head agreement in CP. As we discuss in section 3.3, evidence for Spec-head agreement in CP is very obscure in languages like English and the ones that we are considering here.

Second, if we accept the assumption that complementizers can be turned into proper head governors, the implication would be that complementizers are included in the class of (possible) proper head governors. This would constitute a weakening of an otherwise quite strong empirical claim that the class of proper governors includes all and only lexical categories. As we see in Chapter 4, despite the apparent absence of the *that*-trace effect in German, Dutch and West Flemish, which at first glance appears to require the assumption that complementizers are proper governors in these languages, it is possible to account for the absence without admitting complementizers into the class of proper governors. It thus seems a bit rash to abandon the strong claim in view of the superficial fact about English relative clauses.

Third, it is not quite clear how we can justify the idea that sharing of indices licenses proper government. It is true that an antecedent-government relation obtains between


elements that have the same index (provided that there are no barriers intervene). But as we discussed in section 1.4.2, indices are but convenient notation device to indicate certain relationships. If indices have no theoretical standing, then it is hard to see how they bear on theory of proper government.

In the next section, we will consider an alternative that faces none of the issues that we raise in this section.

5.6.4. The Complementizer *That* as an Expletive

We now come to one last alternative, which I will defend here, according to which the complementizer *that* is the one and the same expletive in both relative clauses and complement clauses. The grammatical difference between the *that*-trace sequence in relatives and that in complements is to be accounted for by the motivation of abstract verb movement.

Let us first have a look again at the relevant grammatical contrast that we want to account for, given in (104) and (105), repeated from (87b) and (87a):

(104) *Who do you think [_{CP} *t* [that [_{IP} *t* left]]]?


(105) The man [_{CP} *O* [that [_{IP} *t* left]]]


Recall from section 5.5.3 our account of the lack of the *that*-trace effect in relative clauses according to which the complementizer *that* in relative clauses is an expletive. It thus must delete according to FI. After deletion, the finite verb moves to the vacated C position in order to provide the CP with a predicative head. The derivation is given in (106):

(106) a. LF *that*-deletion: The man [_{CP} *O*_i [\emptyset [_{IP} Bill saw *t*_i]]]

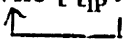
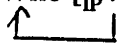
b. Abstract verb-movement: The man [_{CP} *O*_i [saw [_{IP} Bill *t*_i]]]


the verb to the vacated C position, which then yields two desirable results. One is that the relative clause CP can now function as a predicate, and the other is that the subject trace is head-governed. The grammaticality of the example in (106) is thus accounted for.

To conclude this section, we see that a unified analysis for the distribution of the complementizer *that* is possible. In fact, it is the one and same complementizer *that* that appears in both complement clauses and relative clauses. The grammatical difference between a *that*-trace sequence in complement clause and that in a relative clause is to be accounted for by abstract verb movement. We need no more assumption than what we have already made independently, namely, the Principles of Economy of Representation and Last Resort.

5.7. Short Subject Extraction

After seeing various motivations for abstract movement, we return to the issue of short subject extraction, since it is not obvious how head-government obtains in these cases. As we mentioned in section 4.6.5, if there is actually movement to the local [SPEC, CP] in constructions like those in (108) and (109) (henceforth referred to as **main and embedded clause short subject questions** respectively), then a non-trivial problem for the conjunctive ECP immediately arises with respect to head-government of the subject trace:

- (108) $[_{CP} \text{Who} [_{IP} t \text{ left}]]$

- (109) John wondered $[_{CP} \text{Who} [_{IP} t \text{ left}]]$


Although antecedent-government of the subject trace obtains straightforwardly (which incidentally would satisfy the ECP according to the disjunctive formulation of proper government), it is not obvious that there is a head-governor for the subject trace in these cases. On the other hand, the examples are also perfectly consistent with the assump-

tion that there is no movement in these constructions (George (1980), Chung and McCloskey (1983)). If that is true, then there would be no traces, and the ECP would be irrelevant.

The question of whether there actually is movement in short subject extraction is of some importance if we are to attribute cases of ungrammatical extraction to the ECP. We will first look at Koopman's (1981) proposal that there must be vacuous movement in main clause short subject questions, and then consider the role of the rule *do*-support (Chomsky (1957)) in extraction of non-local subjects, and the reason why it does not apply to cases of extraction of local subjects. Answers to these questions bear on the issue of whether subject *wh*-phrases move in short subject questions.

5.7.1. Vacuous Movement of Subjects

On the basis of the distribution of *quoi* in French, Koopman (1981) argues that there must be movement of the local subject in short subject questions. As the paradigm of *quoi* in (110)-(112) shows, *quoi* may not appear by itself in the Spec of a tensed CP⁹:

- (110) a. $\overbrace{[\text{CP Qui/*Quoi [as-tu \quad \text{vu } t]]]}^{\downarrow}$
 Who/what have-you seen
 'Who/what did you see?'
 b. $[\text{CP A qui/\grave{a} \text{quoi [penses-tu } t \cdot]}]$
 About who/about what think you
 'About who/what are you thinking?'

⁹This claim is apparently counter-exemplified by the following examples (Grevisse (1988)):

- (i) a. *Quoi était plus intolérable que cette dérision.*
 what was more intolerable than this derision
 'What was more intolerable than this derision?'
 b. *Mais, à la fin, quoi vous autorise à croire, . . .*
 but to the end what you entitles to believe
 'But, after all, what entitles you to believe, . . .'
 c. *Quoi te manquait alors?*
 what you missed then
 'What did you miss then?'

- (111) a. Je me demande qui/*quoi tu as vu.
I wonder who/what you have seen
'I wonder who/what you saw.'
- b. Je me demande à qui/à quoi tu penses.
I wonder about who/about what you think
I wonder about who/about what you are thinking.'
- (112) a. Qui/quoi voir?
Who/what see
'Who/what to see?'
- b. Je me demande qui/quoi voir.
I wonder who/what see
'I wonder who/what to see'

Assuming the earlier view of clause-structure with one pre-IP position, Koopman (1981) proposes a surface filter like the one in (113)¹⁰ (cf. Obenauer (1976)):

- (113) *_[COMP quoi], where COMP exhaustively dominates *quoi*.
+T

The filter in (113) can be easily adjusted to something like that in (114) to conform to the current view of clause structure:

- (114) *_{[CP quoi [_{IP} I°]]}, if I° is [+TENSE]

¹⁰Note that the description of the filter would correctly allow the following examples (Grevisse (1988)), if the filter in (113) is taken literally as it is:

- (i) a. Quoi donc t'étonne?
what you surprise
'What surprises you?'
- b. Quoi d'autre pourrait m'amener chez toi à cette heure?
what of other could me take at you at this hour
'What else could take me to your house at this hour?'
- c. Qui ou quoi vous a donné cette idée?
who or what you have given this idea
'Who or what gave you this idea?'

The constituent in COMP does not, strictly speaking, exhaustively dominate *quoi*, although it does dominate exactly one constituent whose head is plausibly *quoi* in these examples except (iic).

The filter in (113), or its equivalent (114), crucially does not apply at LF. A non-echo question with *quoi* in-situ is grammatical:

- (115) Tu as fait quoi?
you did what
'what did you do?'

At LF, all *wh*-phrases in-situ raise to the Spec position of a [+WH] COMP (= [SPEC, CP]), the LF-representation of the example in (115) would be something like that in (116):

- (116) [_{CP} Quoi_i [_{IP} tu as fait *t_i*]]
what tu have done
'What did you do?'

If the filter applied at LF, then the representation in (116) would be ruled out, an incorrect result. Observe that there is a grammatical contrast in the pair of examples in (117):

- (117) a. *Quoi est arrivé ?
what is arrived
'What happened?'
b. Qui est arrivé ?
who is arrived
'Who arrived?'

If we are to apply the filter (114) to rule out the example in (117a), then it must be the case that *quoi* has moved [SPEC, CP] at S-structure.

Koopman (1981) argues that movement to COMP at LF does not create a configuration of proper government; otherwise, *quoi* can simply remain in-situ, evading the filter (114) at S-structure, then raises at LF. We would then incorrectly admit the starred examples in (110), (111) and (117) as grammatical. Assuming government by COMP, she suggests that Aoun, Hornstein and Sportiche's (1981) mechanism of index-percolation be applied only at S-structure:

- (118) $[_{\text{COMP}} X'' \dots] \rightarrow [_{\text{COMP}_i} X_i'' \dots]$
 iff COMP dominates only *i*-indexed elements.

Thus, if *quoi* moves to COMP at S-Structure, the resulting representation would be ruled out by the filter in (114). If it does not move at S-structure, but at LF, then index-percolation would not apply at that level of representation. Consequently, COMP would not have an index, and government by COMP would fail. One way or the other, if *quoi* is in the subject position at D-structure, the representation containing it would inevitably violate some condition or another.

The theoretical implication of Koopman's analysis of *quoi* is that subject *wh*-phrases other than *quoi* like *qui* in French or its counterparts in languages that have syntactic *Wh*-movement also must move at S-structure, even though the movement is string-vacuous. The difference between *qui* and *quoi* would then be the filter (114), to which *qui* is not subject. However, the assumption that the index-percolation does not apply at LF seems a bit too strong. In colloquial French, it is possible to have adjunct *wh*-phrases in-situ:

- (119) a. Tu es arrivé quand?
 you is arrived when
 'When did you arrive?'
 b. Tu es venu comment?
 you is come how
 'How did you come?'

If adjunct *wh*-phrases move at LF (Huang (1982), Lasnik and Saito (1984)), then their traces must be antecedent-governed, which is possible only if index-percolation applies at LF, the level of representation where *wh*-phrases in-situ move to COMP.

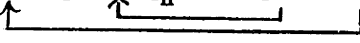
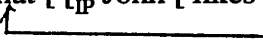
The filter as formulated in (114) must be at S-structure. But alternatively, it can be stated as in (120):

- (120) * $[_{CP} \text{ quoi } [_{IP} I^\circ]]$, if I° is [+TENSE]
 [+NOM]

It is simply irrelevant whether the filter in (120) applies at S-structure or LF. If we adopt this filter instead of that in (114), then there would be no motivation for movement of the local subject in short subject questions.

5.7.2. Extraction of Non-Local Subjects and *Do*-support

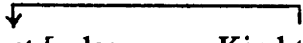
Consider a simple interrogative like that in (121a) where the object is extracted:

- (121) a. What does John like?
 b. $[_{CP} \text{ What } [\text{ does } [_{IP} \text{ John } [\text{ } \iota \text{ like } \iota]]]]$

 c. * $[_{CP} \text{ What } [[_{IP} \text{ John } [\text{ likes } \iota]]]]$


Two questions that immediately come to mind is why the object must move, and why there must be *do*-support. We put aside here the question of why some language have *Wh*-movement at S-structure, and why some have it at LF (cf. Cheng (1991) for a discussion of typology of *Wh*-movement).

5.7.2.1. The Adjacency Condition for Morphological Support

Travis (1984) claims that on the assumption that empty COMP (=C) must be properly governed, it would follow from the ECP that finite verbs must move to COMP in non-subject-initial root-clauses in verb-second Germanic languages like German and Dutch (she adopts the earlier view of clause structure with the COMP position for verbs, complementizers and a fronted XP, although only the first two occur in the head position of COMP):

- (122) $[_{S'} \text{ Den } \text{ vater } \text{ hat } [_{S} \text{ das } \text{ Kind } \iota \text{ geküsst }]]$
 the.ACC father has the.NOM child kissed
 'The child kissed the father.'
- 

She suggests that INFL, however, can be identified by inflectional affixes, and may

remain phonetically empty under two circumstances: (i) if it is properly governed by COMP (=C); or (ii) if it contains some inflectional affixes and is adjacent to the verb. She assumes that inflectional affixes are randomly generated and are checked by some means. For example, a [+PAST] verb would have to be governed by a [+PAST] INFL. These two cases are illustrated in the German examples in (T2a) and (123b) respectively:

- (123) a. Hans sagte [_{S'} dass [_S Maria [[+PAST] [_{VP} das Kind geküsst hat_[PAST]]]]]
 b. [_S Maria [[+PAST]+hat_[PAST] [_{VP} das Kind *t*]]]
-

Since the [+PAST] INFL in (123) is not adjacent to it, the verb must move to INFL. Contrast the example in (123b) with the English example in (124):

- (124) a. Peter bought a book.
 b. [_S Peter [+PAST] [_{VP} bought_[+PAST] a book]]

Since INFL is adjacent to the verb in this case, no verb movement is required, deriving the fact that INFL moves to V in English (Emonds (1976, 1978)).

Travis argues that INFL must be spelled out with a verbal pleonastic *do* when the string adjacency (with respect to the verb) is disturbed:

- (125) a. Peter did not buy a book.
 b. [_S Peter [do+PAST] not [_{VP} buy a book]]
- (126) a. Did Peter buy a book?
 b. [_{S'} [do+PAST]_i [_S Peter *t*_i [_{VP} buy a book]]

She also suggests that attachment of inflection to a verb is a local rule¹¹, and happens at PF, and traces do not interfere with string adjacency, which explains why there is no *do*-support in main clause short subject question:

¹¹Local rules are here understood to be Local Transformation as defined in Emonds (1976):

Local Transformation: a transformation or a transformational operation that affects only an input sequence of a single nonphrase node C and of one adjacent constituent C' that is specified without a variable, such that the operation is not subject to any condition exterior to C and C', is called a "local transformation" (or a local transformational operation).

- (127) a. Who saw it?
 b. [_{S'} who_i INFL_j [_S t_i t_j see it]]
- (128) a. What did she see?
 b. [_{S'} what_i do+INFL_j [_S she t_j see t_i]]

The reason why INFL in (128) must be spelled out with *do*-support is because the subject *she* intervenes between it and the verb. Her analysis also accounts for why both sentences in (129) and (130) are ungrammatical (with *did* unstressed), which are the results of the lack of *do*-support in (128b) and its application in (127b) respectively:

(129) *What saw she?

(130) *Who did see it?

Travis's account does not explain the grammaticality of (131a) and (132a), however:

- (131) a. Peter sometimes bought a book.
 b. [_S Peter_r [+PAST] sometimes [_{VP} bought_[+PAST] a book]]
- (132) a. Who sometimes bought a book?
 b. [_{S'} who_i [+PAST]_j [_S t_i t_j sometimes [_{VP} bought_[+PAST] a book]]]

In the representations in (131b) and (132b), [+PAST] in INFL is not adjacent to the verb, yet the lack of *do*-support does not result in ungrammaticality. On the contrary, the application of *do*-support to the representations in (131b) and (132b) would yield ill-formed surface forms:

(133) *Peter did sometimes buy a book.

(134) *Who did sometimes buy a book?

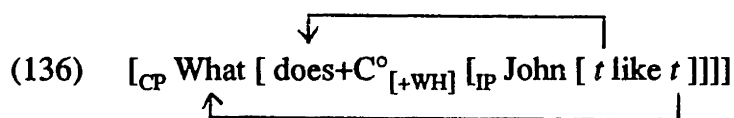
It thus seems that the obligatory presence of the auxiliary *do* in some environments cannot be explained by *do*-support applying to non-adjacent INFL and the finite verb.

5.7.2.2. Short Subject Extraction and the ECP

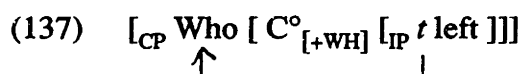
Rizzi (1991) suggests that the reason why a *wh*-phrase must move to [SPEC, CP] is because there is an abstract complementizer C with the [+WH] feature, which must have a *wh*-phrase in its Spec by the *Wh*-Criterion:

- (135) *Wh*-Criterion
- a. A *Wh*-operator must be in a Spec-head configuration with X° .
[+WH]
 - b. An X° must be in a Spec-head configuration with a *Wh*-operator.
[+WH]

On this view, then, the structure of the example (121a) would be something like (136), and the auxiliary *do* is attracted by the abstract [+WH] C° :



By the *Wh*-criterion, a subject *wh*-phrase also must move:

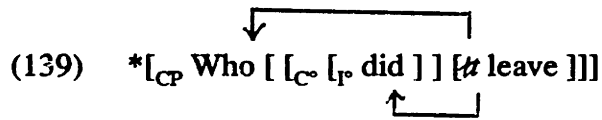


The Kinande examples in (138), from Zagona (1988), appear to be a prima facie evidence that there exist [+WH] C° 's, if the *o*-particle is a C° as in the structure in (138c) (cf. section 3.5 for a brief discussion):

- (138) a. Mary a-ka-langIra aBana.
SM.PRES.see the children
'Mary sees the children.'
- b. EkIhI_i kyO_i Mary a-ka-langIra t_i ?
what SM.PRES.see
'What did Mary see?'
- c. [EkIhI_i [kyO_i [Mary a-ka-langIra t_i]]]

According to Rizzi, the reason why there is no *do*-support for extraction of a local

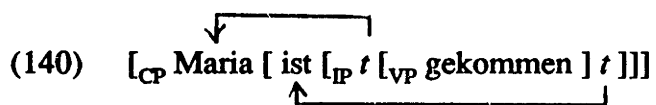
subject in main clauses is because of the ECP. The structure of (137) with *do*-support would look something like (139):



Rizzi suggest that a C°, being a head that is intrinsically inert for government, does not acquire the relevant governing capacity if a head is moved into it. The auxiliary *do* governs the subject trace, but not properly so since it is not in its immediate projection (cf. Roberts and Rizzi (1989)). Consequently, the subject trace in (139) lacks a proper head-governor, violating the head-government requirement for the conjunctive ECP.

Apart from the lack of independent motivation for abstract complementizers which we mentioned in section 5.3, there are some further empirical problems with Rizzi's account, however. First, it does not explain why there must be *do*-support in extraction of non-local subjects. That is, if an abstract C° is possible in (137), then why should the same not be true in (136), where *do*-support must apply obligatorily? Second, since the example in (136) is grammatical, it must be that the trace left behind of the fronted auxiliary *do* is properly head-governed. The same applies to the example in (137) as well. Now, if this trace can be properly head-governed, then it is not clear why the trace in [SPEC, IP] which is higher in the tree cannot be. If the reason why the fronted auxiliary cannot properly head-govern the trace in [SPEC, IP] is because the auxiliary is not in its immediate projection, then how is its own trace properly head-governed?

In fact, the assumption that a head can properly govern only within its own immediate projection necessitates further assumption about C. According to Rizzi, the reason why proper head-government of the subject trace in Germanic languages is possible is due to C being intrinsically endowed with governing capacity:



More specifically, whereas Cs in full verb-second languages have the features [+C, +I] (cf. Platzack's (1986b) hybrid category CONFL), those in residual verb-second languages like English have the features [+C, -I]. INFL, however, has the feature [-C, +I] in both types of languages (Rizzi (1990b)):

- (141) a. ... [_{+C', +I}] [_{+C^o, +I}] [_{-C^o, +I}] [_{-C, +I}]^{max} *t* ...
 b. ... [_{+C', -I}] [_{+C^o, +I}] [_{-C^o, +I}] [_{-C, +I}]^{max} *t* ...

In (141a), the moved head matches at least the [+I] specification of the host head, but that in (141b) does not. If the condition for head-government is restated as requiring government within an immediate projection which has an overlap in categorial features, then we can distinguish the two cases in (141). The reason why the moved head in (141b) cannot govern the trace in [SPEC, IP] is that the immediate projection of the host head has no overlap of categorial features with the moved head.

Besides the fact that we must have head-government of the trace of the auxiliary *do* when it moves to C in cases of extraction of a non-local subject, it is not clear if, within the theory of feature composition of C and INFL we are discussing here, the representation in (141b) should not be allowed independently of head-government of the subject trace. The moved head has the feature [-C, +I] and the host has the features [+C, -I]. They thus have disjoint sets of categorial features. Thus, the representation in (141b) might be ruled out on the ground that the head of the CP dominates a head which has nothing in common with the C projection, violating X'-theory.

5.7.2.3. ECP Effects in Main Clauses

Koopman (1983b) argues that the ungrammaticality of cases of main clause short subject questions with *do*-support can be assimilated to the *that*-trace effect:

(142) *_{S'} [_{COMP} Who_i did] [_S *t*_i leave]]

(143) *_{S'} Who_i [do you think [_{S'} [_{COMP} *t*'_i that] [_S *t*_i left]]]]

If we take t' in (142) as *who* in (143), then the structures of (142) and that of the embedded clause in (143) are identical. Koopman correctly points out that we cannot attribute the ungrammaticality of (142) to Chomsky and Lasnik's (1977) Doubly-Filled COMP Filter, given in (144), since (145) is grammatical:

(144) The Doubly-filled COMP Filter (DFCF)
 $*[_{\text{COMP}} \textit{wh}\text{-phrase } \phi] \phi \neq e.$

(145) $[_{\text{S}'} [_{\text{COMP}} \textit{Who}_i \textit{did}] [_{\text{S}} \textit{John see } t_i]]$

It is not difficult to see that the same result also obtains in the current view of clause structure according to which the positions of the *wh*-phrase and the complementizers are different:

(146) $*[_{\text{CP}} \textit{Who}_i [\textit{did} [_{\text{IP}} t_i \textit{leave}]]]$

(147) $*[_{\text{CP}} \textit{Who}_i [\textit{do you think} [_{\text{CP}} t'_i [\textit{that} [_{\text{IP}} t_i \textit{left}]]]]]$

The position where *did* occurs is exactly the same as that of the complementizer *that* in the embedded clause of the example in (147).

Although the assimilation of (146) to (147) seems natural at first glance given that their structures are quite parallel, there are four reasons why we should not treat them on a par. First, the inherent nature of *did* and *that* are quite different. Whereas the complementizer *that*, being an expletive, has little semantic contribution, *did* bears Tense and agreement features, even though it does not exhibit morphological alternation with respect to the ϕ -features of the subject with which it agrees. With a verb like *be*, morphological manifestation of agreement features is particularly clear:

- (148) a. Who is running?
 b. *Who be running?
 c. *Who are running?

With our assumption concerning the conditions on deletability, *that* may be deleted (in fact, it must be FI), *did* may not. When we look at the structure of (146) with some details indicating verb movement as given in (149), the auxiliary *did* is in a position governing the subject trace, and thus should properly head-govern it:

(149) * $[_{CP} \text{Who}_i [\text{did}_i [_{IP} t_i [t_i \text{leave}]]]]]$

In theories which assume co-indexing as a condition on government, the auxiliary *did* should also govern the subject trace. It is co-indexed with the *wh*-phrase *who* by Spec-head agreement (either in CP as in Rizzi (1990a), or in IP by virtue of chains).

In fact, the configuration in (149) is precisely the one obtains in verb-second languages where the finite verb has moved to the head-position of the matrix CP, as a German sentence like that in (150) and a Dutch sentence like that in (B25) illustrate:

(150) $[_{CP} \text{Wer}_i [\text{ist}_j [_{IP} t_i [_{VP} \text{gekommen}] t_j]]]]$
 who is come
 ‘Who came?’

(151) $[_{CP} \text{Wie}_i [_{C'} \text{heeft}_j [_{IP} t_i [_{I'} [_{VP} \text{hem/Jan gezien}] t_j]]]]]$
 who has him/Jan seen
 ‘Who saw him/Jan?’

We can in principle relate the lack of the ECP effect in German and Dutch main clauses to the possibility of having doubly filled COMP in these languages (Koopman (1984)). An example like that in (152a) would have the structure either like that in (152b) in the earlier view of clause structure or that in (152c) in the current view, which is exactly like a main clause in (151):

- (152) a. *Wie denk je dat hem/Jan gezien heeft?*
 who think you him/Jan seen has
 ‘Who do you think saw him/Jan?’
 b. $[_{S'} [_{COMP} t_i \text{dat}] [t_i [_{VP} \text{hem/Jan gezien}] \text{heeft}]]$
 c. $[_{CP} t_i [\text{dat} [_{IP} t_i [_{VP} \text{hem/Jan gezien}] \text{heeft}]]]$

Koopman (1982) suggests that the difference between English and Dutch would be reducible to the assumption that the index-percolation rule applies to a COMP in English only if it exhaustively contains a *wh*-phrase or its trace¹² It is very unclear how the same account can be made to work in current terms.

In theories assuming disjunctive ECP, the *wh*-phrase should antecedent-govern its trace in (151). The example in (146) ought to be grammatical. In theories of conjunctive ECP, perhaps we have to say that in English there is no Spec-head agreement in CP, so that the finite verb would have no index, and hence fails to head-govern the subject trace. Although this would work for (146), the grammatical example in (153) without *do*-support would be problematic, if we assume there is movement of the subject (cf. discussion of Rizzi's analysis above):

(153) [_{CP} Who_i [C° [_{IP} t_i left]]]

In theories that crucially rely on co-indexing as a condition for government, the C° in (153) would not govern the subject trace without an index.

Second, assimilating the ill-formedness of the examples in (146) and (147) leaves the ungrammaticality of the sentence (154) unexplained, which differs minimally in that a non-*wh*-phrase appears in [SPEC, IP]:

(154) *[[_{IP} Peter [did [_{VP} leave]]]

There is no movement from [SPEC, IP] in this example, the ECP account for (146) would not explain its ungrammaticality.

Third, Koopman (1983b) correctly points out that any analysis of English must con-

¹²The implicit assumption here (cf. section 5.7.1) is that for Dutch, COMP gets the index of the *wh*-phrase even if COMP contains differently indexed elements.

tain mechanisms to ensure the application of *do* in INFL if INFL is not adjacent to V (or, alternatively, the disappearance of *do* if it is adjacent to V (Emonds (1976)), but she does not explicitly sketch out a theory of *do*-support. Without the details of such a theory, it is difficult to see whether the presence of *do* in short subject extraction in main clauses is due to the ECP or to the way the theory of *do*-support works. Suppose we have a theory of *do*-support that informally says something like what the rule in (155) states, applying at PF:

- (155) *Do*-support
 I+[+PAST] → do / DP _____ not/V where DP ≠ ∅

That is, *do* is inserted between an overt DP and the negation *not* or a verb. Alternatively, we might have a theory along the lines given in (156):

- (156) *Do*-deletion
 do → ∅ / _____ t

That is, *do* is deleted before a trace. Leaving aside the question of the adequacy of the two rules involving the auxiliary *do* outlined above and their theoretical standing in syntactic theory, the point here is that if we have such theories of *do*-support, then the distribution of *do* in main clauses has nothing to do with the ECP. In particular, the absence of *do* in subject extraction then is due to either the inapplicability of (155) or the deletion of the auxiliary by rule (156).

As we saw in section 4.3.2.2, the auxiliaries can properly head-govern a VP-trace. Thus, there seems to be no reason to think that it cannot properly head-govern the subject trace in structures like (146). The ungrammaticality of main clause short subject questions with *do*-support thus must lie somewhere else, not in the theory of proper government. This conclusion is further supported by the fact that *do*-support, when possible, must be at S-structure (or at PF. Cf. Pesetsky (1989)), the level of representation where the ECP crucially does not apply. Because if it did, then INFL-lowering in languages

like English would be impossible. As a corollary, even if there is the subject is actually moved to [SPEC, CP] in main clause short subject question, and the head C position is empty, the structure would not violate the ECP at S-structure:

$$(157) \quad \text{S-structure: } [_{\text{CP}} \text{Wh } [[_{\text{IP}} t [I^{\circ} [V^{\circ} \dots]]]]]$$

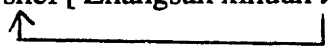
The issue then is not so much about proper government of the subject trace, but for the obligatory absence of the auxiliary *do* at S-structure.

5.7.3. Main Clause Short Subject Questions as IPs

We now proceed to give an account for why main clauses short subject questions can be IPs, and for the lack of *do*-support in these structures. We then return to the categorial identity of main clause short subject questions at LF.

Let us first consider the question of why a *wh*-phrase must move. From a semantic point of view, if we treat *wh*-phrases as operators of sort, which take an open sentence as argument and yield as extension a set of true sentences, each of which is the result of substituting an individual for the variable (the trace of the *wh*-phrase left behind by movement) in the open sentence (Karttunen (1977)), then the reason why *wh*-phrases must move to an A'-position to function as an operator, and to create an open sentence.

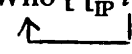
From a syntactic point of view, some island effects would be accounted for by subadjacency, a condition on movement, if we assume *wh*-phrases move (Chapter 2). In fact, even in languages like Chinese that do not have syntactic *Wh*-movement, some ECP effects involving *wh*-phrase in-situ would also be explained if we assume that it undergoes abstract movement at LF (Huang (1982)). The grammaticality of the examples in (158a) would be explained if a *wh*-phrase in-situ moves at LF to the Spec of the embedded CP, as in (158b), since the matrix verb *xiang-zhi-dao* 'wonder' requires an interrogative complement:

- (158) a. Wo xiang-zhi-dao Zhangsan xihuan shei.
 I wonder like who
 'I wonder who Zhangsan likes.'
 b. Wo xiang-zhi-dao [_{CP} shei [Zhangsan xihuan *t*]]
- 

It thus appears that we have both theoretical and empirical reasons to assume that *Wh*-movement takes place universally at some level of representation, although something more need to be said in order to account for the parametric variations with respect to the level of representation in which *Wh*-movement occurs (Cf. Cheng (1991) for a discussion of the typology of *Wh*-movement), an issue that is beyond the scope of this dissertation.

Suppose we have a syntactic theory of interrogatives, according to which a question must have the configuration in which the *wh*-phrase must c-command the predicate of which it is an argument (with the proviso for parametric variations with respect to the level of representation where *Wh*-movement takes place). In fact, it must end up in a [SPEC, CP] position in accord with the general assumption about the positions where *wh*-phrases can appear ([SPEC, CP] or the base-position but nowhere else). Which [SPEC, CP] it would eventually rest depends on general principles of the grammar.

With this theory of interrogatives, there need not be S-structure movement of the subject in short subject questions. It is easy to see that the S-structure of the familiar example in (159a) is well-formed under this view:

- (159) a. S-structure: [_{IP} Who [left]]
 b. LF: [_{CP} Who [[_{IP} *t* left]]]
- 

However, for the reasons mentioned above, the *wh*-phrase still has to move to a [SPEC, CP], the LF-representation for (159a) must be as in (159b).

Although the problem of head-government of the subject trace remains (there being no

head-governor. We will return to this problem below), the S-structure representation in (159a) would receive the same explanation as that given to in (B22) as to why there is no *do*-support, for which an account based on Economy seems plausible.

Chomsky's (1989) Principle of Economy requires that universal rules and principles take precedence over language-specific rules (section 1.2). In order to derive (B22), we need to make use of the rule of *do*-support specific to English, whereas the well-formed sentence in (160a) employs solely principles of UG:

- (160) a. Peter left.
 b. S-structure: [_{IP} Peter [_{I'} *t*_i [_{VP} left+I_i]]]
 c. LF: [_{IP} Peter [_{I'} [left+I]_j [_{VP} *t*_j]]]

The operations of INFL lowering to V at S-structure, and of LF V+I raising to the trace of INFL left behind at S-structure all involve the UG principle of Move- α . The derivation of (160a) is thus grammatical, but that of (B22) is not. Exactly the same explanation can be given to the example in (159a).


5.7.4. The Root-clause Condition and Head-government

Consider now the question of why *do*-support must apply in cases of extraction of a non-local subject. By assumption, a *wh*-phrase in object position must at S-structure to [SPEC, CP]. The head position of the matrix CP is thus empty. The structure in (161) is possible in an embedded context, but not as a matrix question:

- (161) a. *_{CP} What [_{IP} John saw *t*]]
 b. Mary wondered _{CP} what [_{IP} John saw *t*]]

The reason cannot be attributed to the C position in the matrix clause being not properly governed, hence violating the ECP (Travis (1984)), since a C position may remain empty in ungoverned position:

(162) The man [_{CP} who [[_{IP} John saw *t*]]]



Thus, there appears to be some condition on root-clauses to the effect that their head positions must be filled:

(163) **Root-clause Condition (RCC)**
 The head-position of a root-clause must be filled.

With this condition, *do*-support must apply, yielding the representation in (164) for the structure in (161a):

(164) [_{CP} What_{*i*} [did [_{IP} John see *t_i*]]]

The RCC does not seem to be reducible from other principles of the grammar. In particular, it does not appear to follow from Holmberg's (1986) suggestion that a predicate must have a [+V] head (cf. section 5.4.3.5). There is simply no subject-predicate relation holding between the *wh*-phrase and the predicate *see* (or the auxiliary *did*, if it qualifies to be a predicate at all).

We can appeal to the RCC applying at LF, which would require verb movement to C (after the verb has moved back to INFL), yielding the representation in (165) for the structure in (159b):

(165) LF: [_{CP} Who_{*i*} [left [_{IP} *t_i* *t*]]]



In this structure, the subject trace is properly head-governed, the desired result.

It turns out that the same account can be given to main clause short subject questions in Welsh. Recall that in Welsh main clause questions, the C position is occupied by a complementizer. In particular, with short subject questions, the C position is occupied by

the complementizer *a*, which is plausibly an expletive given that it does not seem to contribute much to the meaning of the example:

- (166) a. S-structure: $[_{CP} \text{Beth}_j [a [_{IP} \text{ddarllenodd} [_{VP} \text{Siôn} [t_j]]]]]$
- b. LF expletive deletion: $[_{CP} \text{Beth}_j [\emptyset [_{IP} \text{ddarllenodd} [_{VP} \text{Siôn} [t_j]]]]]$
- d. LF verb movement: $[_{CP} \text{Beth}_j [\text{ddarllenodd} [_{IP} \text{Siôn}_i [t_j] [_{VP} t_i [t_j]]]]]$

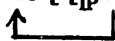
The RCC is thus satisfied at S-structure. At LF, however, the complementizer *a* must delete, by FI. After deletion of the complementizer *a* at LF, the structure in (166c) obtains, which is exactly like the structure in (161a) in English. The RCC applies (again) at LF, verb movement thus must take place, yielding the well-formed representation in (166d). The problem of head-government of the subject trace in main clause short subject questions in English and Welsh has exactly the same account.

5.7.5. Embedded Short Subject Questions

Unfortunately, the RCC does not quite work for short subject questions in embedded clauses. In a LF-representation like that in (161b), repeated here as in (167), there should be no movement:

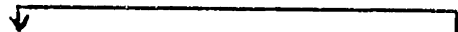
- (167) Mary wondered $[_{CP} \text{what} [[_{IP} \text{John saw } t]]]$

Since the embedded clause is not a root-clause, the RCC does not apply. In addition, by the Principle of Last Resort, verb movement is not allowed unless there is some reason for it (recall that verb movement cannot be motivated by the ECP; otherwise, we will lose the *that*-trace effect. Cf. section 4.5.4). By the same reasoning, no verb movement at LF is permitted in the structure in (168) (the *wh*-phrase *who* must move for the familiar reasons):

(168) Mary wondered [_{CP} who [_{IP} *t* saw John]]]



The sentence should be ungrammatical since the subject trace in the embedded clause is not properly head-governed, an incorrect result.

The same problem arises in Welsh. Embedded short subject questions are possible:

(169) a. S-structure: 'Dwi 'n gwybod [_{CP} beth [a [_{IP} ddarllenodd [_{VP} Siôn [*t*]]]]]]
 am prt know what prt saw
 'I know what Siôn saw.'
 b. LF expletive deletion:
 'Dwi 'n gwybod [_{CP} beth_i [∅ [_{IP} ddarllenodd [_{VP} Siôn [*t*_i]]]]]]


After deletion of the complementizer *a*, the subject trace in the embedded clause is not properly head-governed without verb movement to C.

As in the case of extraction out of an embedded clause without an overt complementizer (section 4.6.5), we should be very careful about verb movement to C in embedded clauses. Recall a structure with an ungrammatical *that*-trace sequence as in (170a) would have a representation like that in (170b) after deletion of the complementizer *that*:

(170) a. S-structure: Who do you think [_{CP} *t* [that [_{IP} *t* left]]]]

 b. LF: Who_i do you think [_{CP} [∅ [_{IP} *t*_i left]]]

If we are to motivate verb movement to C in the structure in (168), we have to make sure that it would not apply to (170b). The motivation would then have to be closely related to the presence of a *wh*-phrase in the Spec of CP to which the verb moves, which would distinguish the structure in (168) from that in (170b) in that the latter only has a trace in the Spec of the embedded CP.

The structure of the embedded clause in (168) is reminiscent of a relative clause. In

section 5.4.3.5, I argue that verb movement in subject zero relatives is motivated by the Predicate Principle:

- (171) a. S-structure: The man $[_{CP} \text{ who } [_{IP} t \text{ saw John }]]]$
 b. LF verb movement: The man $[_{CP} \text{ who}_i [\text{saw } [_{IP} t_i t \text{ John }]]]$

But we cannot appeal to the Predicate Principle for verb movement in (168). The embedded clause is not a predicate, but an argument of the matrix verb *wondered*. The well-formedness of the sentence in (168) thus appears to present a non-trivial for theories assuming the conjunctive ECP. My speculation is that there may be a condition on the syntactic form of a question in that the head position must be filled, or that the *wh*-phrase that is the head of an A'-chain must bear a Spec-head relation with a lexical head. I will leave this problem for future research.

We note in passing here an account that is entirely consistent with the expletive replacement analysis of complementizer agreement (section 3.2.1.4), but has some conceptual and empirical problems with it. Along the lines of Rizzi's (1990a) idea of having an abstract complementizer C, the relevant structure of a short subject question can be schematically represented as in (172), where the indices indicate same values of ϕ -features:

- (172) $\dots [_{CP} \text{ wh}_i [\overset{\vee}{\text{C}}_i [\text{IP } t [\text{V+I}_i \dots$

That is, the subject moves to the local [SPEC, CP], by Spec-head agreement, it has the same ϕ -features as the *wh*-phrase in its Spec. Since the V+I complex agrees with the *wh*-phrase (via its trace) by Spec-head agreement, it has the same ϕ -features as those of C (by transitivity). The V+I complex can now move to C to replace it. The resulting structure would be something like (173), where the subject trace is properly head-governed:

(173) ... [_{CP} wh_i [V+I_i [_{IP} t_i [t ...

The problems with such an approach are familiar. There does not seem to be independent justification for the abstract complementizer. Nor is there evidence for Spec-head in CP in English. More specifically to English, no explanation for the obligatory *do*-support in main clause question where a non-local subject is extracted. If a representation like (174a) is possible, an instance of the structure in (173), there is no reason why that in (174b) is not:

(174) a. S-structure: [_{CP} Who_i [C_i [_{IP} t_i left]]]

b. LF: [_{CP} Who_i [left [_{IP} t_i t]]]

(175) a. S-structure: * [_{CP} Who_i [C_i [_{IP} you saw t_i]]]

b. LF: [_{CP} Who_i [saw [_{IP} you t t_i]]]

Thus, the problem of head-government of the subject trace in cases short subject extraction in embedded clauses is that there does not seem to be any reason why the verb should move to the C position. In fact, it is precisely for that reason that the *that*-trace effect shows up in languages like English in which there is no independent constraint requiring such movement.

5.8. Agreement in Relative Clauses

In this section, we will look into the question of how the agreement patterns of the sort illustrated in (176) are to be accounted for:

(176) a. The man [_{CP} O_i [that [_{IP} t_i was/*were here]]]

b. The men [_{CP} O_i [that [_{IP} t_i were/*was here]]]

(177) a. The man [_{CP} O_i [that [_{IP} John said [_{IP} t_i was/*were here]]]]]

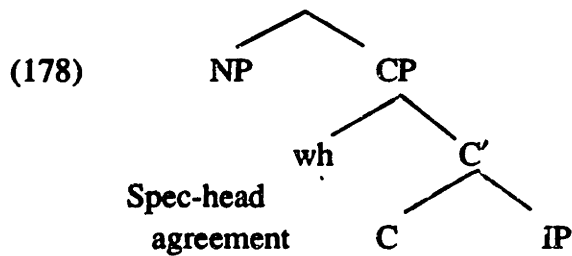
b. The men [_{CP} O_i [that [_{IP} John said [_{IP} t_i were/*was here]]]]]

It is not so much an issue of proper government of the traces in these constructions, since we have seen why the grammatical patterns obtain as they do in the previous sections. Nor is it so much a question of the specific mechanisms accounting for agreement that have far-reaching theoretical consequences. The issue that I would like to look at briefly in this section is whether agreement facts observed above is in any way implicating the complementizer.

The reason why the issue is of some relevance to this work is that if the complementizers are crucially involved in accounting for the grammaticality of the examples in (176) and (177), then a consequence that follows is that complementizers with agreeing features cannot be deleted but can only be replaced. We will first look at an analysis according to which the complementizer is crucial in accounting for agreement in relative clauses, and show that an alternative is readily available in which the complementizer is not implicated. The theoretical interest of the alternative is that with the complementizer being irrelevant for agreement, in other words, it bears no agreement features, no problem would arise for FI since it can delete at LF. In the same vein, I show that what appears to be *prima facie* evidence for agreeing complementizers in Arabic relative clauses can be straightforwardly accommodated in the alternative view.

5.8.1. Agreement Chain and Predication

Browning (1987) suggests that there is an agreement chain (cf. section 5.4.3.1) in relative clauses, which is constituted by the relative operator and the trace it binds. The operator agrees with the complementizer by Spec-head agreement (in CP), and the complementizer in turn agrees with (the head of) the NP it modifies. Thus, the modified NP would derivatively agree with the operator-chain. The idea is illustrated in the diagram in (178):



It is easy to see that the agreement patterns observed in the examples in (176) and (177) can be correctly accounted for by the idea of agreement chain.

Nonetheless, it is not obvious that the agreement facts in relative clauses should implicate the complementizer. The implicit assumption here is that the agreement between the head of relative clause CP and the NP it modifies is a head-head relation. But formally, it is quite difficult to see what the relation is. It is certainly not a Head-complement relation. The relationship between the relative clause CP and the relative head NP it modifies is clearly a subject-predicate relation, just like the example in (179), where the AP *tall* is predicated of the NP *man*:

(179) The [[_{AP} tall] [_{NP} man]]

But it is not obvious if the complementizer can be said to be predicated of the relative head NP the way that the adjective *tall* can. Consider the example in (180):

(180) The man [_{CP} O_i [that [_{IP} John saw t_i]]]

While there seems to be some semantic relation between *tall* and *man*, it is not clear what semantic relation might hold of the complementizer and the relative head.

If we are to implicate the complementizer in the agreement chain, then we certainly have to posit an abstract complementizer in zero-relatives, since we must establish an agreement chain to account for agreement in these constructions as well:

(181) a. The man [_{CP} O_i [C^o [_{IP} John said [Bill claimed [t_i was/*were here]]]]]]]

- b. The men [_{CP} O_i [C° [_{IP} John said [Bill claimed [t_i were/*was here]]]]]

But we mentioned in section 5.3, independent justification for such an abstract entity appears to be very weak¹³:

A further issue arises for agreement chains in constructions involving pied-piping, although we should note that these are problematic independently (cf. the next section). Consider the examples in (182):

- (182) a. The man [_{CP} [_{DP} whose parents]_i [C° [_{IP} t_i [are poor]]]]

- b. The man [_{CP} [_{PP} of whom]_i [C° [_{IP} Mary had a picture t_i]]]]

Apart from the problem of semantics raised by the representations of the sort in (182) (cf. section 5.4.3), there are some problems for syntax as well. Browning points out that at S-structure, there are no agreement chains in the examples in (182). Strictly speaking, the relative operators in these examples are not in the configuration in (178). They are dominated by some maximal projection, and bear no Spec-head relation to the C°'s. In order to establish an agreement chain, Browning suggests that at LF, the relative operators move out of their base-positions, adjoining to the projections that dominates them at S-structure, as in (183):

- (183) a. The man [_{CP} [_{DP} whose [_{DP} t parents]]_i [C° [_{IP} t_i [are poor]]]]
- ↑
└──────────┘

- b. The man [_{CP} [_{PP} whom [_{PP} of t]]_i [C° [_{IP} Mary had a picture t_i]]]]
- ↑
└──────────┘

Further assumption about agreement need to be made in this case. Either the index and

¹³Incidentally, the notion of agreement chain is not compatible with the idea that some abstract complementizer can be turned into a proper governor. Consider the ungrammatical example in (i):

- (i) *The man [_{CP} O_i [C°_i [_{IP} t_i left]]]]

In this structure, if C° agrees with the relative head *man*, and also with the empty operator in its Spec by Spec-head agreement, then we would predict the C° in (i) to be able to act as a proper governor, an incorrect result.

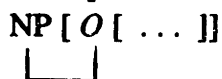
features of the relative operator may percolate to the pied-pied projection or C may agree with an element in its Spec which it governs. Of course the mechanics would work, but there does not seem to be strong reason why such specifics are necessary.

5.8.2. Agreement Linking

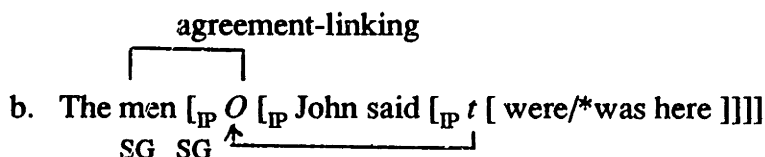
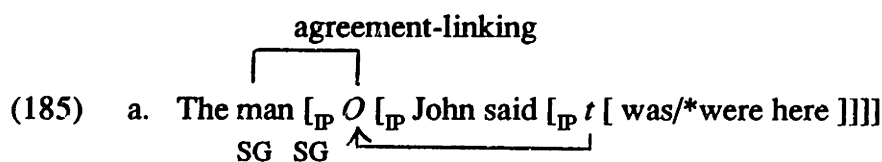
I would like to suggest that agreement of the sort in illustrated in (176) is mediated by the empty operator, by some kind of agreement linking rule (cf. Rothstein's (1983, 1984) predication linking), not via the complementizer of the relative clause:

(184) **Agreement-linking Rule**

Link the relative operator to NP in the configuration:



What the agreement-linking rule does is to match the ϕ -features borne by the relative head NP and the operator-chain¹⁴. Let us take the simple examples in (K5) for illustrations:



For constructions involving pied-piping, the agreement-linking rule works in a similar way. As we discussed in section 5.4.2, we must have the LF-representation in (186b) (by reconstruction) for the S-structure in (186a), in order to map it onto the λ -expression in (186c):

¹⁴We may take empty operators as having ϕ -features inherently, or come to share the set of ϕ -features of the element to which it is linked. There does not seem to be reason to favor one view over the other. For concreteness, we will assume the latter view.

interpret them as predicates predicated of the relative head NP, we have to modify our conditions on the syntactic form of a relative clause. It seems that all we need to adjust is to assume a [+PRED] chain as opposed to an operator-variable chain. The conditions in (45) would then be as in (191):

- (191) The syntactic form of a relative clause must:
- a. have a [+PRED] chain; and
 - b. the [+PRED] chain must c-command the clause corresponding to the predicate over which the λ -operator abstracts.

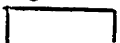
The difference between a [+PRED] chain and an operator-variable chain is that the head of the former is in a A-position, whereas that of the latter is in an A-position, and the underlying reason for this difference is that PRO has the feature [-OP] and relative operators [+OP] (cf. section 3.4 on these features).

The morphology of English is quite impoverished, yet, it is possible to show that there is agreement in infinitival relative clauses as well. Consider the examples in (192):

(192) The man [PRO to give himself/*herself/*themselves a raise]

(193) The men/*man [PRO to gather in the courtyard]

The checking of the ϕ -features by the Agreement-linking Rule can be as in (194) and (195):

- agreement linking
- (194) a.

 The man [PRO to give himself a raise]
MASC MASC MASC
- agreement linking
- b. *The man [PRO to give herself a raise]
MASC MASC FEM

- agreement linking
- (195) a. The men [PRO to gather in the courtyard]
 PL PL
- agreement linking
- b. *The man [PRO to gather in the courtyard]
 SG SG

By the Agreement-linking Rule, PRO has the feature masculine Gender in (194). The masculine reflexive *himself* is bound inside the relative clause in (194a), obeying principle (A) of the binding theory. With the mismatch in Gender feature in (194b), the feminine reflexive *herself* is not bound in the relative clause, violating principle (A). The verb *gather* requires a plural subject, which PRO in (195) can satisfy with the plural Number feature, as result of Agreement-linking Rule. But PRO in (195) has the singular Number feature, failing to meet the requirement of the verb. The example is thus ungrammatical.

In fact, in languages like French where there is overt morphological alternation on relative operators like *lequel* ‘which’, the effect of the Agreement-linking Rule is more transparent. Consider an example involving pied-piping like the one in (196a):

- (196) a. L’hommes avec lesquels Jean parle
 the men with which.PL talks
 ‘The man with whom Jean is talking’
 b. LF: L’hommes [lesquels_i [Jean [parle [avec *t_i*]]]]
 c. Semantics: $\lambda x(\lambda y)(\text{homme}(y))(x) \wedge \lambda z(\text{Jean parle avec } z)(x)$

The agreement-linking rule would account for the ungrammaticality of the example in (196a) with the relative operator in singular Number:

- (197) a. S-structure: *L’hommes [CP [avec lequel] [IP Jean [parle *t*]]]

b. LF: L.'hommes [lequel_i[Jean [parle [avec t_i]]]]
 MASC.PL MASC.SG

Let us now turn to Arabic relative clauses where there is morphological alternation of some sort in accord with the relative head. Borer (1984) points out the similarity between Hebrew complementizer *she/ʔasher* and *ʔallati* in Standard Arabic relative clauses in that both show up only in the topmost CP that modifies the relative head NP, with the difference that the latter shows morphological agreement in Number, Gender and Case:

- (198) a. Raʔaytu l-fatata ʔallati yuridu ʔax-i an yatawwaʒa-ha
 saw-I the-girl that want brother-mine that marry-her
 'I saw the girl the my brother wants to marry.'
- b. Raʔayu d-dubata ʔallađina qala l-i l-xakimu
 saw-I the-officers that said to-me the-governor
 ʔina-hu saʒana l-mutamaridina allđina satamu-hum.
 that-he arrested the-rebels that insulted them
 'I saw the officers that the governor told me
 that he arrested the rebels who offended them (the officers).'

Like the Hebrew complementizer *she* 'that', the Arabic complementizers *an* or *ʔina* appear in complement clauses:

- (199) Qalat l-fatatu ʔina-ha saafarat ʔila lubnana.
 said the-girl that-she traveled to Lebanon
 'The girl said that she traveled to Lebanon.'

Thus, if *ʔallati* (or any one of its other agreeing forms) is a C^o, then in the theory of expletive replacement suggested in section 3.2.1.4, it cannot be replaced. This is because it agrees with the relative head which may or may not be related to the local subject in the relative clause. Consequently, the verb that is in the most local INFL may or may not be able to replace it. (Recall that only a verb in the local INFL can replace an agreeing C^o). To see this, let us have a look at a structure of the example in (198) with *ʔallati* as a C^o (for concreteness, I assume no movement in relative clauses with a resumptive pronoun. This decision should not affect our discussion of the categorial status of *ʔallati*, however):

- (200) L-fatata [_{CP} O_i [?allati [_{IP} yuridu ?axi [_{CP} an [_{IP} yatawwaža-ha_i]]]]]
 the-girl that.3SG.FEM want.MASC brother-mine that marry-her

The verb *yuridu* ‘want’ agrees the subject *?axi* ‘my brother’, which is masculine, but the complementizer *?allati* is feminine. Thus the verb in the local INFL cannot replace the agreeing C°].

Instead of treating *?allati* as a complementizer agreeing with the the relative head by A-agreement as Rizzi (1990a) suggests, schematically:

- (201) L-fatata [_{CP} O_i [?allati+AGR [... t_i ...]]]
 └──────────────────┘
 A-agreement

we can consider *?allati* as an overt operator, binding the resumptive pronoun in argument position, and the agreement between it and the relative head is established by the Agreement-linking Rule:

- (202) L-fata... [_{CP} ?allati_i [[_{IP} yuridu ?axi [_{CP} an [_{IP} yatawwaža-ha_i]]]]]
 └──────────┘
 agreement linking

This alternative would then have no problem with a C° with agreement features that cannot delete.

In conclusion, I should say that the Agreement-linking Rule does not seem to be in any way more explanatory than other theories of agreement in relative clauses, especially in those constructions with pied-piping, the point that I would like to make here is that there is no strong reason to assume that agreement in these cases crucially involves the complementizer. In fact, if we take FI seriously, then we should seek alternatives in which the complementizer is not implicated to the effect that it bears no φ-features. It could thus be deleted at LF, in accord with FI.

5.9. Conclusions

In this chapter, we saw that there are two other independent motivations for abstract verb movement to C. In a theory of relative clauses which requires a syntactic constituent to have an operator-variable binding configuration in order for it to be interpreted as a predicate (i.e. to be mapped onto a λ -expression), and that the head position of a relative clause must be filled by a lexical category, by the Predicate Principle, abstract verb movement to C must occur in these constructions. Otherwise, the representation would ultimately be ruled out by FI.

Some desirable consequences for theory of proper government would follow on this view. As a result of abstract verb movement to C, the subject trace in a relative clause (the uppermost CP) comes to be properly head-governed by the verb, accounting for the anti-*that*-trace in these constructions. The advantage of this account is that there is no need to assume that the complementizer appearing in relative clauses is different from the one occurring in complement clauses.

The other case of abstract verb movement to C are those involving short subject extraction in main clauses. We saw that with some constraint on root-clauses requiring that the head position of these constituents be filled by a lexical category, we can account for independent facts about the obligatory application of the rule of *do*-support in main clause non-subject questions and its general inapplicability in embedded contexts. Again, the subject trace in these constructions would then be properly head-governed by the verb as a result of its abstract movement to C.

The example in (i) can be given a Head-raising analysis with no problems for theta theory, but the Chain Condition:

- (i') [IP There [VP is [DP a man] [t below [VP wants to speak to you]]]
-
- The diagram shows a horizontal line with an upward-pointing arrow at the left end and a downward-pointing arrow at the right end. The line is positioned between the DP 'a man' and the VP 'wants to speak to you', indicating movement from the latter to the former.

Movement of the DP *a man* is to a Case-marked position (cf. Lasnik (1991)).

Labov (1972) reports that the following examples are possible in some dialects of Black English:

- (iv) a. Ain't nothin' went down.
 b. It ain't no cat can't get in no coop.
 (cf. *There isn't any cat that cannot get into any (pigeon) coop* in Standard English)
 c. It always somebody tougher than you are.
 d. We have vert few go to college.

The example in (ivb) is clearly a short subject zero-relative, although it is not very clear that the example in (iva) is. It can conceivably be analyzed as in (v) in standard English, as an object relative:

- (v) There's [DP nothing [CP O [that [IP you can do about t]]]]
-
- The diagram shows a horizontal line with an upward-pointing arrow at the left end and a downward-pointing arrow at the right end. The line is positioned between the DP 'nothing' and the CP 'that [IP you can do about t]', indicating movement from the latter to the former.

According to Labov, Cohen, Robins and Lewis (1968), cited in Emonds (1976), dialects of Black English have Subject-Aux Inversion in embedded clauses. (The example in (vib) seems possible in Standard English, with a pause between the two clauses. Cf. *Where did she get the coat from? I don't know.*):

- (vi) a. I don't know how did I do it.
 b. Where did she get the coat from I don't know.

The following examples are also found in Labov (1972):

(vii) a. I asks Alvin do he know how to play basketball.

If verb-raising to C in embedded contexts is systematic in these dialects, then the grammaticality of the example in (ivb) can be accounted for by the same reason, whatever it might be, for why verbs raise to C in these dialects.

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