ADJUNCT EXTRACTION AND CHAIN CONFIGURATIONS

by

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ABSTRACT

This study is concerned with the semantic content of complementizers, and with the modes of interpretation of adverbial *wh* elements and with their possibilities for *wh* movement. It examines the event structure of complement clauses, revealing a difference of semantic function between the complementizers in tensed factive complement clauses and propositional complement clauses. This yields a difference in their effects on adverbial *wh* extraction. The effect of complementizers on *wh* extraction points to the Minimality Condition, taking effect for nongoverning heads such as complementizers. An attempt is made to define antecedent government in such a way as to capture the Minimality effects of complementizers.

Chapter 1 reviews some pertinent aspects of the underlying syntactic and semantic frameworks, and contains a brief outline of the thesis.

Chapter 2 examines the event structure of complement clauses. It argues that the event position of factive complements is discharged by the factive complementizer, yielding an interpretation of factive complements as involving discourse binding of the event position of the complement clause. It then examines the event position of various infinitival complement clauses and of gerunds, as well as some other contexts which involve discourse binding of an event variable, and which exhibit the resulting presupposition that the event occurred. In all cases, event positions which are not bound are found to exhibit the possibility of unselective binding by an adverb of quantification.

Chapter 3 examines the pattern of adverbial *wh* extraction from factive and propositional complement clauses and shows that this pattern depends on the event structures of the complement clauses detailed in Chapter 2. Adverbial *wh* extraction out of infinitivals and gerunds is then examined, along with extraction from some other contexts which involve discourse binding of the event variable.

Chapter 4 examines some simplifications in extraction theory that follow from a typology of chains at LF proposed by Chomsky. On the basis of these simplifications, a radically reduced system of γ-marking is proposed for extraction theory. A definition of antecedent government is then formulated so as to capture the Minimality effects on antecedent government of intervening complementizers.

Chapter 5 summarizes the results of the thesis and discusses them in the light of some recent literature.

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CONTENTS

Chapter 1

Preliminaries and Theoretical Framework

1.0 Introduction

Much of this dissertation is concerned with the construal and *wh* movement of adverbial constituents. It brings together certain techniques in current syntactic and semantic theories in such a way that they interact intricately with one another. The underlying framework is therefore a composite of syntactic and semantic devices and notions. Nevertheless, the elements that enter into the framework adopted here can be factored into the syntactic and the semantic, so that it makes sense to say that this framework has two components, one of which is commonly regarded as a theory of syntax, and the other as a theory of semantics. And the conclusions arrived at here can be evaluated in terms of their implications, if they should be correct, for the underlying syntactic and semantic theories that went into them. Therefore, we begin with an overview of the syntactic and semantic notions that will be drawn upon especially heavily in this study, and those on which this study would have the most impact insofar as it is correct.

1.1 The Syntactic Framework

The syntactic framework for this thesis is Government-Binding theory, as developed and manifested in Chomsky (1981), Stowell (1981), Aoun and Sportiche (1983), Kayne (1983a), Chomsky (1986a), Chomsky (1986b), and Chomsky (1989). The thesis will draw mostly on recent

formulations of the theory of *wh* movement, especially those in Lasnik and Saito (1984, forthcoming) and Chomsky (1986b). To a large extent, the thesis is a commentary on these latter two works, developing and modifiying ideas within them, in part within the context of more recent ideas, drawn especially from Chomsky (1989) and Chomsky (Class lectures, Fall 1989, Fall 1990). The goal in this section is mainly to review aspects of the theory for which some modification will be suggested in the work that follows.

The phrase structure in Chomsky (1986b) will be adopted here, with binary branching throughout.

(1) $XP \rightarrow YP\ X'$
$X' \rightarrow X\ ZP$

The position of YP in (1) is called the specifier of XP, denoted spec-XP. The specifier of XP is not a phrase structure category, but a position for certain items related to the head X, such as an external argument of X, certain modifiers, and perhaps determiners.

One of the driving considerations of the theory of *wh* movement, since Huang (1982), is to explain the divergence between extraction properties of arguments and adjuncts. By arguments are meant, primarily and paradigmatically, θ-marked NPs. By adjuncts are meant adverbial elements such as reason adverbials (*in order to* and *because* clauses in English), and manner adverbials, as well as a variety of selected adverbials. Locative and temporal modifiers are also adjuncts; however, they do not diverge as

radically from arguments in their behavior upon *wh* movement as reason and manner adverbials do.

One driving concern of extraction theory is the subject/object asymmetry that arises in *wh* movement of arguments out of a tensed complement, as in (2).

(2) a. What do you think [that [John bought t]]
b. * Who do you think [that [t hired John]]

A second driving concern is an asymmetry of arguments and adjuncts by which objects can extract out of islands, exhibiting subjacency effects, as can subjects when the extraction site is far enough removed from the island, whereas adjuncts cannot.

(3) a. ? What do you wonder [whether John bought t]
b. ??Who do you wonder [whether John said [t visited Mary]]
c. * Why do you wonder [whether John resigned t]

(4) a. ? What do you believe [the claim [that John stole t]]
b. ??Who do you believe [the rumor [that John claims [t fired Mary]]
c. * Why do you believe [the claim [that John arranged the coup t]]

Furthermore, although adjuncts are limited in their extraction possibilities to the extent indicated in (3)-(4), adjunct extraction does not manifest the *that*-trace effect of subject extraction, shown in (2b).

(5) a. Why do you think [that [Mary hired John t]]
b. How do you think [that [John fixed the car t]]

Lasnik and Saito (1984, forthcoming) account for these asymmetries on the basis of the proper government requirements on the traces of movement.

(6) α properly governs β iff either
   a. α lexically governs β, or
   b. α antecedent governs β.

(7) α antecedent governs β iff
   a. α binds β (α c-commands β, and α and β arecoindexed), and
   b. There is no γ (γ = S' or NP) such that α c-commands γ and γ dominates β, unless β is the head of γ.

These definitions are employed under a system of assumptions that distinguish the situation of argument traces from that of adjunct traces. In particular, adjunct extraction as in (5) can occur across overt complementizers, unlike subject extraction in (2b). L&S assume that complementizers can delete at LF, thus allowing the extracted adjunct to antecedent govern its trace in (5). By the recoverability condition on deletion, this presupposes that complementizers lack nonrecoverable semantic content. Furthermore, this approach to comp-trace effects requires that the *that*-trace violation in (2b) be recorded somehow, else the *that*-trace violation will disappear upon deletion of the intervening complementizer at LF. L&S introduce γ-marking, the assignment of an abstract feature to traces, in order to accomplish this. In particular, they formulate the ECP as in (8), with the γ-marking mechanisms spelled out in (9).

(8) ECP: A movement trace must have the feature [+γ] at LF.

(9) γ-Marking (Lasnik and Saito)

1. If an argument trace is properly governed at S-structure, then it is marked [+γ]. Otherwise it is marked [-γ].

2. γ-marking is indelible: once a trace has been assigned either [±γ], it retains that specification for γ.

3. The trace of an adjunct is not γ-marked as either [±γ] at S-structure. An adjunct trace is marked at LF as [+γ] if it is properly governed at LF; otherwise it is marked [-γ].

Since the adjunct traces in (5) cannot be antecedent governed over the intervening complementizers at S-structure, the γ-marking of adjunct traces must be deferred until LF, at which point the complementizers have deleted.

L&S adopt the phrase structure of the Extended Standard Theory, according to which complement clauses have the following structure.

(10) [S' COMP [S ...]]

L&S assume that COMP takes the index of the element generated in it, or, if it is empty in the base, the first element to move into it. Antecedent government by an element α in COMP is possible only when COMP has the index of α; L&S construe such antecedent government as being, actually, head government by COMP. Antecedent government by α in COMP is blocked when there is a complementizer in COMP since the complementizer is the head of COMP and therefore blocks the transmission of the index of α to COMP. If we adopt the Chomsky (1986b) phrase structure in (1), then we lose the L&S explanation for the failure of antecedent government

over a complementizer. Within the framework of Chomsky (1986b), the effects of antecedent government over a complementizer can be captured by the Minimality Condition, stated, in one form, as follows.

(11) a. α does not (antecedent) govern β in (11b) if γ is a projection of δ excluding α.
b. ... α ... [$_{\gamma}$ ... δ ... β ...]

Consider the configuration in (11b) when α is an extracted element in spec-CP whose trace β lies within IP. In this case, if δ is a complementizer, and γ=C', it follows by (11a) that α does not antecedent govern β.[1] Thus, Minimality should block antecedent government over complementizers.

In the chapters 2 and 3 below, the dependence of adverbial *wh* extraction on the presence of complementizers will be examined. Finally, in Chapter 4, relying on the idea (Chomsky, Class lectures, Fall 1990) that chains must be uniform in order to be legitimate LF objects, a much simplified system of γ-marking will be proposed in which the γ feature is assigned as a privative feature rather than as a binary feature specification, where the assignment of γ is needed only for the original trace of argument extraction. The characteristics of adverbial *wh* extraction are determined by the well formedness of the LF chain of adjunct extraction, and by the mechanisms of adverbial *wh* construal explored in Chapters 2 and 3.

In Chapter 4 below, antecedent government will be defined in such a way as to capture Minimality effects induced by complementizers with

[1]Chomsky (1986b) assumes that the I system is defective for Minimality, as it is for the definition of barriers, so δ=I and γ=I' in (11b) does not induce Minimality.

semantic content. In particular, the Government Domain of a head X will be defined as its m-command domain together with the specifier and head of its complement (if any). This, in itself, is a sort of local domain delimited by Minimality. Assuming that INFL is an extended projection of V, the Government Domains of V and I fuse together to form an Extended Government Domain. Antecedent government is taken to be free within an Extended Government Domain. In particular:

(12)
α antecedent governs β iff
a. α binds β (α c-commands β, and α and β are coindexed), and
b. There is an Extended Government Domain containing both α and β.

Under assumptions about head movement adopted in Chapter 4, this definition effectively captures Minimality effects of complementizers.

1.2 The Semantic Framework

This section will review the semantic framework developed in Higginbotham (1985, 1989). In section 1.2.3, a small modification will be suggested in the way in which we understand the mechanisms of this framework. The object is to arrive at explicit representations of the truth conditions of a sentence. These representations will usually be given in formulas of first order logic, called logical forms. These are to be distinguished from LFs, which are representations at the level of LF in the grammar.

1.2.1 Theta role discharge and semantic composition

To begin with, the modes of θ-role discharge must be enlarged beyond the operation of θ-marking. A verb has an array of semantic arguments, filling various thematic roles, which must be projected into the syntax. This thematic structure is recorded in the lexicon as positions within a θ-grid (Stowell 1981). For example, the θ-grid of the verb *see* is of the form <1,2>, where the first entry '1' is the role of the agent of seeing, and the second entry '2' is the role of the patient, the entity seen. These θ-roles are projected in the syntax as argument positions which, by the Projection Principle (Chomsky 1981), must be present at all levels of syntactic derivation in the grammar. An argument is projected (in accord with X'-theory) from a position in the θ-grid of the verb, and assigned the corresponding thematic role; the assignment of this thematic role is called θ-marking, and the corresponding entry in the θ-grid of the verb is thereby discharged. This meets a necessity of lexical semantics: that the verb be provided with a sequence of arguments, each bearing an appropriate thematic role. Through θ-marking, the available θ-roles are paired with arguments one-by-one. Thus θ-marking is a mode of semantic composition for a verb with its arguments. Furthermore, θ-marking can be taken as the basis for a certain part of semantic composition: it is the syntactic condition under which the argument places of a predicate are saturated.

But θ-marking will not suffice as the basis of semantic composition for some other predicates. A common noun, such as *dog*, has an open position, in evidence in (14) below, where the open position is projected

up to VP and predicated of an individual by θ-marking, yielding the (simplified) interpretation in (13b).

(13) a. Fido is a dog
b. dog(Fido)

This motivates a lexical entry for *dog* along the lines shown in (14), where the position *x* is a generalized thematic role.

(14) dog (+N, -V, <x>)

With its open position undischarged, the head [$_N$ dog<x>] denotes the function from individuals to truth values that is true for an individual just in case it is a dog (or extensionally, it denotes the set of all dogs). But then in the context in (15), there is no NP argument to be θ-marked and thereby to discharge this open position.

(15) The dog entered the room

In these contexts, Higginbotham assumes that the determiner discharges the open position in [N'<x> dog] (where the θ-grid is projected up to N' since its open position wasn't discharged at N). Discharge by the definite determiner in (15a) has the effect of mapping the set of all dogs to a unique dog. This mode of θ-role discharge is called **θ-binding,** illustrated in (16a) below, where the empty angle brackets <> indicate a θ-grid whose θ-roles have all been discharged. The semantic effect of θ-binding in (16a) is to introduce the iota operator in (16b).

(16) a. [$_{NP}$ the [$_{N'<x>}$ [$_{N<x>}$ dog]]]
b. ιx dog(x)

The resulting NP enters into further semantic operations (those that operate outside the NP, in the context in which it occurs) as a closed expression.

With an indefinite determiner in (15), we will adopt Heim's (1982) theory of existential closure. The indefinite determiner does not bind the open position in N'; this open position then projects up to the NP node of an indefinite. The indefinite NP<1> raises and adjoins to IP at LF where it can be bound by an adverb of quantification or by an unselective existential quantifier ∃ which is adjoined to IP above it.

In order to capture the effects of quantificational variability that indefinites manifest in the scope of certain unselective binders (Lewis 1975, Heim 1982), the indefinite determiner must fail to discharge the open position, leaving it open to be bound by the unselective binder. Consider the example in (17a) from Lewis (1975), whose interpretation can be expressed as in (17b).

(17) a. A quadratic equation usually has two solutions
b. Most(x) [x a quadratic equation] (x has two solutions)

As Lewis argues, the adverb in such sentences is an intrinsically unselective adverb of quantification whose domain of quantification is determined by what variables are available in the context. In (17a), the adverb *usually* quantifies over quadratic equations, as expressed by the quantifier *most(x)* in (17b). As such, it relies on the presence of a variable in the indefinite NP; a definite NP cannot occupy the same position, with the same quantificational interpretation of the adverb. This

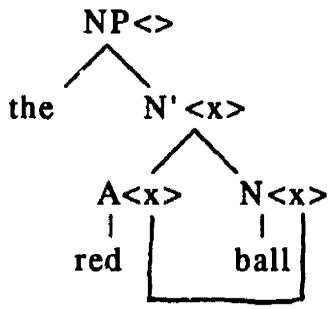
suggests that the indefinite NP in (17a) should have a free variable, as argued by Heim (1982).

The semantic needs of other predicates motivate two additional operations on θ-roles. There is a very straightforward form of adjectival modification, in which a common noun is further delimited by an adjective. This is the case in (18a), which has the interpretation in (18b).

(18) a. The red ball
b. ιx [red(x) & ball(x)]

The predicate-argument structure in (18b) suggests that the adjective *red* has an open position of its own; the interpretation in (18b) can be derived from thematic structure (in the extended sense employed here) if the open position of the adjective is identified with the open position of the head N in a process of **θ-identification**, illustrated in (19) below.

(19)



The θ-positions of the A and N are identified at N', and the resulting position is discharged by the determiner at N', yielding the interpretation in (18b). Thus, the effect of θ-identification is to establish that *the red ball* is interpreted as something that is both red, and a ball.

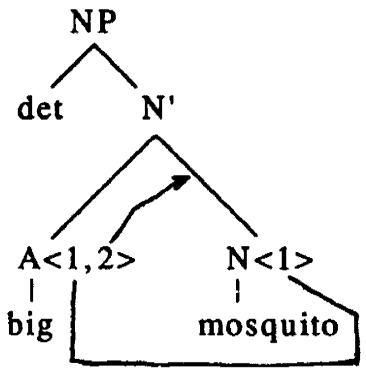
Not all cases of adjectival modification are as straightforward as that involved in (18a). A case in point is the expression in (20a), which has, as a salient interpretation, the one paraphrased in (20b).

(20) a. a big mosquito
b. a thing that is a mosquito, and big for a mosquito

In (20b), instead of conjoining the property of being big directly with the property of being a mosquito, the property of being big is first relativized to the property of being a mosquito, and then conjoined to this latter property. The adjective *big* first looks at the head N it is modifying, and is interpreted as bigness with respect to members of the class denoted by this N, called the comparison class. This aspect of the interpretation of *big* in (20) is captured by adding to the θ-grid of the adjective a position which can only be saturated by a property; the discharge of this position is accomplished by the formal device of **autonymous θ-marking** which takes the property denoted by the head N and uses it to establish a comparison class for the property expressed by the adjective. The lexical entry of the adjective *big* in (20a) is given in (21a), and the interpretation induced by autonymous θ-marking is given in (21b). The process of autonymous θ-marking is illustrated in (21c).

(21) a. big (+V, +N, <1,2>)
b. ιx [mosquito(x) & big(x, {y: mosquito(y)})]

c.



There are yet more subtle cases of adjectival modification, many of them discussed in Higginbotham (1985, 1989). These include modification by adjectives such as *alleged, purported, suspected,* which derive properties from the corresponding verbs, and ones like *rude* which can characterize an action either in its manner or in reference to the people who engage in it. The subtleties will not be needed in the following chapters, and so will not be discussed here.

1.2.2 Event Semantics

The processes considered so far concern the NP arguments in a sentence and the individuals which they denote. For other processes, it is useful to postulate an additional argument position corresponding to the event (or state) described by the sentence. The lexical entry of the verb *see* is then of the form (+V, -N, <1,2,E>), where E is an event θ-position. In a root clause, such as *Mary saw Tom,* the event position of the verb is projected with the θ-grid to VP where it is discharged by θ-binding by a tensed INFL; abstracting away from other θ-roles in the θ-grid, this is represented in

(22).[2] (The empty brackets '<>' accompanying a node indicate that the event position has been discharged below that node.)

(22) $[_{IP}$ Mary $[_{I'<>}$ $[_{I}$ [+Tns]] $[_{VP<e>}$ see Tom]]]

In semantic composition, the θ-binding by a [+Tns] INFL introduces existential quantification over the event variable, with the existential quantifier exported outside the representation of the semantic argument structure, as in (23).

(23) ∃e see(Mary, Tom, e)

In Chapter 2, reason will be given for assuming that the event position of infinitivals is projected up to the IP node of the infinitival clause; this is why only [+Tns] INFL effects θ-binding of the event position. Furthermore, tensed complement clauses will be considered (section 2.1), and reason will be found to assume that their event position is not discharged by INFL; this is why (22) is proposed here only for root clauses.

In straightforward cases of adverbial modification, the adverb is predicated of the event described in the clause. Thus in *The rainbow quickly disappeared,* the adverb *quickly* assigns a property to the event of the rainbow disappearing, namely of being quick (to transpire). This can be captured by θ-identification if we assume that the adverb has an event θ-position of its own, so that is is entered in the lexicon as *quickly* <*e*>.

[2]θ-binding by INFL is structurally analogous to θ-binding by a determiner only if the determiner is in D^0.

Leaving the adverb out of consideration, the sentence asserts that an event characterized as a disappearing occurred, with the rainbow as participant, as in (24a) below. Assuming that the adverb is adjoined to VP, the event position of the adverb can θ-identify with that of the VP, as in (24b). The event position resulting from θ-identification (*e* in (24b)) is projected to the higher segment of the complex VP node formed by adjunction, and θ-bound by INFL[+Tns], yielding the interpretation in (24c).

(24)

a. ∃e [disappear(the rainbow,e)]

b. [IP the rainbow [I [+Tns]] [VP<e> [Adv<e"> quickly] [VP<e'> disappeared]]]

c. ∃e [disappear(the rainbow,e) & quick(e)]

This is only the most straightforward case, in fact, a sort of limiting case. Adverbials don't always modify the event alone, and a sentence like *the rainbow quickly disappeared* is a sort of limiting case in which the event alone is modified. Consider instead a sentence like *John quickly set the table*. This would mean not just that the setting of the table transpired quickly, but also that John was quick (efficient or hurried) in his actions. Other adverbial modifiers, including argument oriented adverbs such as *intentionally* and *reluctantly*, also require more complex mechanisms (primarily just combinations of ones considered so far) by which they characterize the subject.[3] These will not be addressed here. Furthermore, adverbial modification is often relativized to a comparison class. In a sentence like that in (25), wearing away of the pyramids may be an event

[3]Also, manner adverbs often characterize the subject. For example, *clumsily* has a pure subject oriented reading, and a manner reading, but even on the manner reading it characterizes the subject in part, as well as the event (that is, the action).

that will span decades, but it is nevertheless quick against the comparison class of wearings away (of pyramids).

(25) With the increase in tourism over the past few years, the pyramids are quickly being worn away.

This can be captured by autonymous θ-marking, positing an argument place for the comparison class in the θ-grid of the adverb.

1.2.3 Discourse binding

The mechanisms reviewed in sections 1.2.1 and 1.2.2 were presented as though they established absolute reference to things and events in a model. But in fact, to be useful, they had to be understood as implicitly relativized to a discourse context which is not fixed throughout a conversation. For example, [NP *the dog*], interpreted as ιx[dog(x)] on an occasion of use does not refer to the unique dog in the model, but rather to a unique dog established for the purposes of the discourse. A similar point can be made with regard to events/states in the example in (26a), interpreted as in (26b) (from Higginbotham 1985).

(26) a. Mary persuaded me of [John's lack of talent]
b. [∃e: lack(John,talent,e)] Mary persuaded me of e

The state of which Mary persuades me in (26a) might be John's lack of a particular talent which has been established as relevant for the discourse, and (26) would then concern only that one state.

Adopting ideas from Karttunen (1976), Kamp (1981), and Heim (1982), the mechanisms of the previous sections can be interpreted in a way that

makes this implicit relativization explicit. Suppose that a discourse frame is maintained in the course of a conversation. For concreteness and some technical convenience, the conception of a discourse file given by Heim (1982) will be adopted here, with some modifications. On this conception, the discourse frame would be a file of cards. Items within the discourse frame are file cards marked with a referential index, containing pertinent information about the indexed item. Items can be entered into the discourse frame in a variety of ways. They can be established by being explicitly mentioned, as when a conversation is opened with the remark, *A dog bit me yesterday*. Such a remark causes a file card to be introduced with an index i on it and the information "is a dog", along with "bit j", where j is the index of a card corresponding to the speaker. Furthermore, in order to accommodate the event semantics in section 1.2.2, we'll assume that a card is introduced with an index k and written on it the information, "is an event in which i bit j". Another way an item can be entered into the discourse frame is for an object to be salient in a conversation. If a dog walks into a room, his presence evident to all involved in a discourse, and it is obvious that his presence is evident to all, then a speaker can remark, *The dog is hungry*, or *He is hungry*. In this case, the entry of the dog into the room establishes a file with an index distinct from that of any other card in the file, and with suitable information, basically anything that can be gleaned by a casual observation of the dog.

This is idealizing somewhat. Actually, Heim assumes that there is a file of cards for each participant in the discourse, which is particular to the knowledge of that participant and which gets updated accordingly as items are introduced to that participant. In the example at hand, participants may

notice the dog in varying degrees of detail, and some may have to add information to their file for the dog as others call their attention to features of the dog that they hadn't noticed before. Thus, at a given point in the discourse, not all participant's files for the dog will be alike. In the current example, in order for the definite NP *the dog* or the pronoun *he* to be felicitously used, a file card for the dog must be present in the file of each participant, but a card for the state of the dog being hungry need be added only when it is mentioned in the discourse.[4]

From now on, θ-binding will be interpreted as binding within the discourse frame. In place of the iota operator, which selects from the domain of individuals in the model, introduce an operator δ which selects cards within the discourse frame. Then θ-binding by a determiner, as in (27a), will be interpreted as discourse binding, or δ-binding, as in (27b).

(27) a. [NP the [N'<x> dog]]
|_____↑

b. δx[dog(x)]

Furthermore, θ-binding by [+Tns] INFL will existentially bind the event position, not over events and states in the model, but over file cards for events and states. For a given discourse frame D, let D_E be the file card

[4]The exact contents of a person's file, before the dog is mentioned, can be established by the course of the subsequent mentionings of the dog. If the dog enters the room visibly limping, commentary may be opened by someone voicing the speculation, *Maybe he put his foot in the mouse trap.* This comment assumes that everybody noticed the dog's limp, and thereby presupposes that each person has a discourse frame with the information "is limping" or "has a hurt foot" on the file card for the dog, and with a file card for the state "i is limping", where *i* is the index in the public file for the card for the dog. Alternatively, if commentary is opened by someone saying, *Look, the dog is limping,* and if this comment is felicitously made, then the file card for the dog in the hearer's file is established as initially lacking information about the limp, and this information is entered upon the making of this comment.

for events and states in D. Then θ-binding of the event position in (28a) establishes the interpretation in (28b).

(28) a. [$_{IP}$ Mary [$_{I}$ [+Tns]] [$_{VP<e>}$ saw Tom]]

b. $\exists e \epsilon D_E$ [see(Mary, Tom, e)]

In chapter 2, we will encounter cases of δ-binding of the event position.

1.3 Outline of the Thesis

In Chapter 2, the event structure of complement clauses is examined. It is argued that factive tensed complements and propositional tensed complements differ in their event structure, with the event position of the factive tensed complement being bound within the discourse frame by the complementizer of the factive clause, whereas the event position of a propositional complement is bound in semantic composition with the higher, propositional, verb. This effectively assigns semantic content to the factive complementizer.

In Chapter 3, the event structures in Chapter 2 are used to give an account of the patterns of adverbial *wh* extraction out of factive and propositional tensed complements.

In Chapter 4, obligatory and nonobligatory complementizers are examined in terms of their effects on extraction. Using the idea that only uniform chains are legitimate LF chains, the need for the device of γ-marking is minimized, assuming the effects of the Minimality Condition for

nongoverning heads. Antecedent government is then defined in such a way as to capture the effects of Minimality for nongoverning heads.

Chapter 5 concludes the thesis with a discussion of its results in light of some recent literature.

Chapter 2

Events and Presuppositions

2.0 Introduction

This chapter analyzes a variety of presuppositional phenomena as being formally reducible to the form of the presupposition involved in definite descriptions, as in (1).

(1) a. The King of France is bald
b. Presupposition: There is a King of France

In particular, the presupposition in (1) will be analyzed as induced by binding of a variable over individuals within the discourse frame of the speaker upon emitting the utterance. A variety of other presuppositions will be analyzed as being introduced by binding of a variable ranging over events within the discourse frame; this will give them the character of definite descriptions of events. Within the framework of Higginbotham (1985, 1989), outlined in Chapter 1, some mechanisms will be sketched for the structural generation of these presuppositions within a compositional semantics. In the next chapter, the mechanisms introduced here will be taken as the basis for a theory of adverbial *wh* extraction.

2.1 The Event Structure of Tensed Complement Clauses

In this section, it will be argued that factive and nonfactive tensed complements differ in their internal event structure. This will be used to account for various syntactic differences between the two types of tensed

complements, and it will constitute the basis for an account of the differences in adverbial *wh* extraction from the two complement types, to be pursued in the next chapter.

2.1.1 Propositional and factive complements

With regard to a number of properties, to be considered in this and the next chapter, predicates taking clausal complements cluster into two classes, propositional predicates and factive predicates, which I will call p-predicates and f-predicates. When the predicates at issue are verbs, we will refer to p-verbs and f-verbs; when they are clausal complement taking adjectives, we will refer to p-adjectives and f-adjectives. Correspondingly, the complements of these predicates are characterizable as propositional or factive, hereafter, p-complements and f-complements. Examples of p-predicates and f-predicates are given in (2).[1]

(2)

p-verbs: allege, assert, assume, believe, claim, conclude, conjecture, consider, decide, declare, envisage, estimate, fancy, feel, figure, imagine, intimate, judge, propose, report, reckon, say, state, suggest, suppose, suspect, tell, think

f-verbs: admit, comment, emphasize, forget, inform, know, mention, notice, point out, realize, recall, recognize, regret, remember,

p-adjectives: likely, possible

f-adjectives: aware, significant, odd

[1]See Kiparsky and Kiparsky (1971) and Cattell (1978).

Some predicates may be ambiguous between being propositional and factive, including the verbs *convince, report, tell.*[2] The focus will be on p-verbs and f-verbs in this dissertation.

First note that f-complements generally require the *that* complementizer, as in (3ab), although this requirement is not so strong in some cases, such as (3c).

(3) a. * John accepts / mentioned / pointed out / recalls [ϕ [Mary left]]

b. * John informed Bill [ϕ [Mary left]]

c. ? John admits / forgot / noticed / knows [ϕ [Mary left]]

I'll assume that the complementizer is present in all f-complements, even in the cases when an overt complementizer is not clearly obligatory. In view of the lack of uniformity in the data, this point is not a very strong one in

[2]The following data, from Ritter and Szabolcsi (1991), illustrate the ambiguity of *tell* between propositional and factive interpretations. (Ritter and Szabolcsi report only a '*' in (ib), corresponding to the '#' given here.)

(i) a. I told Bill he was being stupid (but I knew he wasn't)
b. I told Bill that he was being stupid (OK/# but I knew he wasn't)

In (ia), where the complementizer is missing, the complement of*tell* is unambiguously propositional, as indicated by the possibility of continuing with the parenthesized material denying the content of the complement clause. In (ib), with the complementizer present, the complement of *tell* can be interpreted as either propositional or as factive, where on the factive interpretation, it is not possible to continue with material that denies the content of the complement clause. A similar contrast hold for *report* and *convince* to the extent that the complementizer can be absent in their complements.

isolation, but the presence of the complementizer will be critical to the analysis developed below, so it will be insisted on nevertheless.[3]

The p-verbs and f-verbs in (2) differ in two other respects that will be discussed here. First, the f-complements can occur with an associated object expletive, as in (4); p-complements cannot.[4]

(4) a. I regret it [that John left]
b. John mentioned it [that Bill just left]]
c. John commented on it [that nobody seems to care]

(5)
a. * I suppose / claim it [that John left]
b. * Bill said it [that John left]

Next, p-verbs can take ECM infinitival complements, with or without raising, as in (6)-(7); f-verbs cannot.

(6) a. We believe / claim / suppose [John to be talented]
b. * We noticed / emphasized / regret [John to be talented]

(7) a. John is believed / claimed / supposed [t to be talented]
b. * John is noticed / emphasized / regretted [t to be talented]

The following seem to defy the generalization that factive predicates do not take ECM complements.

(8) We recognize / find / determined John to be insincere

---

[3]The complementizer seems to be obligatory in the complements of a few propositional predicates. This is discussed in section 2.1.3 below.

[4]In examples like the following, a propositional verb seems to take an object expletive.
(i) I believe it [that John left]
However, this ascription is not actually propositional; it has what Cattell (1978) calls a response stance interpretation, to be discussed later in this section.

However, the sentences in (8) are not straighforwardly factive. They have the quality of an evaluation, asserting that we have arrived at an evaluation of John as insincere. This point will be taken up later in this section when the interpretive difference between propositional and factive complements is discussed.

In order to account for these facts, a structural distinction will be drawn between the complements of p-verbs and f-verbs. For the moment, this difference will simply be stipulated as a means of accounting for the data discussed above. Later in this section, the interpretations of propositional and factive complements will be di ussed more carefully, and an attempt will be made to motivate the structures adopted here. Consider a pair of ascriptions, one of them factive and the other propositional, as follows.

(9) a. John mentioned that Max visited London
b. John believes that Max visited London

Assume that in embedded clauses, INFL does not discharge the event position; discharging the event position is a function of INFL only in root clauses.[5] The event position of a complement clause then propagates higher up in the clause, beyond the INFL node, to IP. Assume that the complementizer in a factive *that*-clause discharges the event position of the clause at IP, as shown in (10).

[5]The actual generalization is that INFL discharges the event position in clauses with an interrogative, assertoric, or relative marker or feature. Then INFL fails to discharge the event position in infinitival and *that* clause complements.

(10) forget [CP<> that [IP<e> Max [I'<e> I [VP<e> visit London]]]]
|_____↑

Assume that in a propositional complement, the complementizer does not discharge the event position, which then propagates to C' and then to CP. Suppose finally that the event position of a propositional complement is discharged in semantic composition with the verb that selects this complement, as in (11).

(11) believe [CP<e> that [IP<e> Max [I'<e> I [VP<e> visit London]]]]
|_____↑

The event position of a factive complement cannot be discharged in semantic composition with the higher verb, as the event position of a propositional complement can. This structural difference between factive and propositional complements is to be assured by selection. A factive predicate selects a closed complement, CP<>. With the INFL node incapable of discharging the event position of the complement clause, the only element within the clause capable of discharging the event position is the complementizer. A propositional predicate selects a complement with an open event position, CP<e> or IP<e>. Thus the event position of a propositional complement clause must remain undischarged up to the CP node.

The facts mentioned earlier in this section can now be accounted for in terms of the selectional properties of the verbs at issue. To begin with, f-complements must have a complementizer since the complementizer of an f-complement plays a semantic role in binding the event position of the complement clause. The complementizer of a p-complement plays no semantic role, and is therefore not obligatory.

Now consider the extraposition data in (4) and (5). The operation of θ-binding is restricted to sisterhood (Higginbotham 1985). Therefore, since the event θ-position of the complement clause of a p-verb is discharged in the process of composing verb and complement, it follows that the complement of a p-verb must be base generated as sister of the selecting verb.[6] This prevents the complement CP from having an object expletive in its place, as in (5a).[7] Since the event position of an f-verb complement is discharged internally to the complement clause, the f-complement is not required to be base generated as sister of the verb that selects it. Therefore, f-complements can occur in the context in (4). If the complementizer of an f-complement failed to discharge the event position of that complement, or if the complementizer of a p-complement did discharge the event position of the complement, selectional requirements of the selecting head would not be met.

Next consider the ECM infinitivals in (6). In such an infinitive, unlike a tensed f-complement, there is no [Tns] morpheme and no complementizer to discharge the event position. Therefore the event position of the infinitive remains undischarged up to the IP boundary of the infinitive, where it must be discharged in composition of the infinitive with the higher predicate. Therefore only a predicate that selects a constituent with an

---

[6]When the propositional complement occurs in a double object structure, as in *John told Bill that Mary left*, there are two choices: we can adopt a structure of the double object VP derived from Larson (1988) in which the complement is a sister of the verb, or we can loosen the strict sisterhood condition slightly to allow discharge by V anywhere within VP.

[7]Complements of [+E] verbs can be displaced transformationally, as in the passive sentence *That Max visited Spain is believed by everyone*. This is consistent with the discussion above since movement chains transmit θ-structure.

open event position can take an ECM infinitival complement. Since p-verbs select an open IP<e>, but f-verbs don't, it is then expected that p-verbs can take ECM infinitivals, as in (6a), and that f-verbs cannot, as in (6b).[8]

We now consider how the mechanisms proposed above might be interpreted. To begin with, a factive complement involves a presupposition to the effect that the event (or state) described in the complement clause actually occurred (holds). The reports in (12) below, for example, all presuppose that Bill sliced the grapefruit.[9]

(12) John mentioned that Bill sliced the grapefruit
forgot
regrets
pointed out

Sentences like those in (12) can be paraphrased as follows.

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[8]Note that, in the discussion of this paragraph, the lack of a [Tns] morpheme and complementizer assure that the infinitival is of the form IP<e>, and is therefore propositional, and not factive. However, it is not true that infinitivals are generally nonfactive. This will be taken up in section 2.2.

[9]In making this claim, it is important to screen out some apparent counter examples. A speaker might use a sentence such as *John mentioned that Bill sliced the grapefruit* as a rhetorical device for putting forth the assertion that Bill sliced the grapefruit. In this event, some of the speaker's audience may not have known beforehand that Bill sliced the grapefruit. It might then seem that the complement clause is not presupposed. However, in such a use, the attitude of the speaker is that the fact that Bill sliced the grapefruit ought to be common knowledge. In using a factive ascription, the speaker is according the complement clause the status of a factive complement, thus getting across the speaker's point --- that the content of the complement clause ought to be accepted by all present. In using (12) in the rhetorical manner just described, the speaker is adopting a discourse frame which contains a relevant event of Bill slicing a grapefruit. If other participants in the conversation are not aware that Bill sliced the grapefruit, or don't believe that he did, then the discourse frame adopted by the speaker for the purposes of using (12) is not actually a discourse frame that all participants in the conversation would accept. Nevertheless, the semantics of an ascription like those in (12) goes through unaffected, as factive complementation. The issue of what discourse frame can actually be adopted in a conversation is a separate issue, distinct from semantic issues.

(13) a. Regarding the event e in which Bill sliced a grapefruit, John mentioned that e occurred.
b. John mentioned that the event in which Bill sliced a grapefruit occurred.

The event structure of an example like this, repeated from (10) above, is the following.

(14)
mention [$_{CP<>}$ that [$_{IP<e>}$ Bill [$_{I'<e>}$ I [$_{VP<e>}$ slice a grapefruit]]]]
|_____↑

The interpretation in (13) can be made dependent on the event structure in (14) if the complementizer *that* δ-binds the event position that it discharges. The interpretation of (14) is then the following.

(15) John mentioned that δe[slice(Bill, grapefruit,e)] occurred

This is precisely (13b). Since the δ-bound event position is referentially transparent, it can be exported from the context of the complement clause, yielding the formulation in (13a).

Turning to propositional complementation, consider first a propositional attitude ascription, as in (16).

(16) John believes [that Max visited London]

In this ascription, there is no presupposition that the event (state) described in the complement clause occurred (holds). There is therefore no role for the discourse frame in formulating the interpretation of this sentence. However, there is need to appeal to another special domain of entities,

namely, John's mental model of the world. An interpretation of (16) can be formulated along the following lines.[10]

(17) $[\exists e \epsilon M_E$: visit(M,L,e)] believe(J,e)

M = John's mental model
M_E = the set of events in M

That is, (16) asserts that there is an event e in John's mental model, and that John stands in a belief relation to that event in his mental model. The event structure of the complement clause, repeated from (11) above, is given in (18).

(18) believe $[_{CP<e>}$ that $[_{IP<e>}$ Max $[_{I'<e>}$ I $[_{VP<e>}$ visit London]]]]

The interpretation in (17) can be made dependent on the structure in (18) if the discharge of the event position by a propositional predicate effects existential quantification over the mental model of the world held by the subject of the attitude ascription. This will now be addressed.

The interpretation in (17) can be derived from the structure in (18) by analogy with the analysis of perception sentences given in Higginbotham (1983), discussed below in section 2.2.2. Consider the perception sentence in (19) below.

(19) John saw Mary leave the barn

[10]See Moltmann (1990) for an elaboration of an approach with a similar underlying idea. See Johnson-Laird (1983) for a theory of mental models.

Such sentences have characteristic properties, and Higginbotham argues that an analysis that captures these properties in a compositional manner is to be favored. These properties, as exhibited by (19), are as follows:

(20)
I. Veridicality: If (19) is true, then it follows that Mary left the barn.
II. Referential transparency: Substitution: The context of the complement is referentially transparent; that is, replacement of a singular term by one with the same reference does not change the truth value of the sentence.
III. Exportability of quantifiers: The following are true.
   a. If John saw somebody leave the barn, then there is somebody who John saw leave the barn.
   b. If John saw nobody leave the barn, then there is nobody who John saw leave the barn.

These properties are captured if we assume that the event variable of the naked infinitive complement in (19) is existentially quantified out, with wide scope over the attribution of the perception, as follows.

(21) [∃e: leave(Mary,the barn,e)] see(John,e)

Putting in the matrix event variable, we increase the adicity of the predicate *see* by one, allowing for the matrix event variable.

(22) (∃e')[∃e: leave(Mary,the barn,e)] see(John,e,e')

But the heart of the analysis is in (21). Since the quantification over the event variable of the complement clause takes wide scope, it follows that the perceived event must have occurred (I.), and since the content of the complement clause is specified outside the scope of the perception verb in (21) and (22), it follows on this analysis that the context of the complement clause is referentially transparent (II.), and allows quantification out of it (III.).

Assuming that the semantics can make use of domains of mental entities derived from John's mental model, the propositional attitude ascription in (16) can be analyzed in a way directly parallel to Higginbotham's analysis of perception sentences, yielding (17). In particular, suppose that we are given M=John's mental model, and M_E=the set of events in M. Then if (16) is true, it follows that there is an event $e \in M_E$ in which Max visits London. Next, suppose that we replace one of the singular terms *Max* or *London* in the complement of (16) with a singular term having the same referent within M, assuming that this means that John takes the two singular terms to refer to the same thing. Then the truth of the sentence in (16) is preserved. Thus, the propositional attitude ascription (16) quite straightforwardly has properties of veridicalty and referential transparency, only relativized to John's mental model M. Finally, we consider whether a relativized version of exportability of quantifiers holds. The question is whether (23a) entails (23b), and whether (24a) entails (24b).

(23)
a. John believes that somebody left the house
b. $(\exists x \in M)$(John believes x left the house)

(24)
a. John believes that nobody left the house
b. $\sim(\exists x \in M)$(John believes x left the house)

These entailments must hold no matter what the grounds are for John's belief. In particular, (23a) must hold when John believes that somebody left the house but has no idea as to who it might have been that left the house; this case arises, for example, when (23a) is true merely because John overheard a person P say "Somebody left the house", and John believes P. In this case, (23b) does not follow if the existential quantifier

over M requires that John be acquainted with a person who he believes to have left the house, or that he have a mental image of this person. However, it is plausible to suppose that if (23a) is true, then a place is reserved in John's mental model for the person who he believes left the house, even if John has no acquaintance with, or mental image of, such a person. On this assumption, (23a) entails (23b). Further, (24a) entails (24b) quite straightforwardly. Thus, a version of the exportability of quantifiers, relativized to the subject's mental model, does hold for propositional attitude ascriptions.

This motivates the analysis of propositional attitude ascriptions given in (17), repeated below.

(17) $[\exists e \epsilon M_E: \text{visit}(M,L,e)]\ \text{believe}(J,e)$

M = John's mental model
M_E = the set of events in M

Adopting this as the analysis of (16), the properties (I.)-(III.), relativized to M, follow automatically. Furthermore, the truth conditions in (17) can be derived straightforwardly from the structure in (18), repeated here.

(18) believe $[_{CP<e>}$ that $[_{IP<e>}$ Max $[_{I'<e>}$ I $[_{VP<e>}$ visit London]]]]

On this structure, the content of the attitude ascription can be treated as an indefinite description of an event, where the event corresponds to the event position of the complement clause, and the indefinite description occurs within the context of the propositional attitude verb *believe*. Under the existential interpretation of indefinites, the unbound variable of the

indefinite description will be quantified out, but we assume that embedding under *believe* relativizes this quantification to John's mental model, establishing the existential quantification over M_E in (17). See section 2.2.2 for discussion of the parallel deriving the interpretation of a perception sentence from the naked infinitive structure of the complement of the perception verb. Altogether, then, the grounds for adopting the structure (18) and interpretation (17) for a propositional attitude ascription such as (16) are identical, modulo relativization to a mental model, to the grounds for adopting the naked infinitive structure for a perception complement, and Higginbotham's analysis of the perception sentence.

A critical and fundamental feature of the interpretation in (17) is obtained by deriving it from the structure in (18). Note that the characterization of the event in the restrictive clause of the quantifier in (17) can be referentially opaque in everything except the variable e. The speaker of the attitude ascription in (16) need not be able to establish independent reference to items about which the subject, John, has beliefs. It may even be that the attitude report involves things that don't actually exist. However, the speaker has referential access to the belief state of John. In saying that John believes a unicorn is in the next room, the speaker cannot refer to a unicorn, since there is none, but the speaker can refer to that part of John's model of the world which (mistakenly) places a unicorn in the next room. The structure in (18) captures this feature of the belief ascription by using the event position of the complement clause to refer to the relevant portion of John's mental model, and by having this event position discharged in semantic composition with the opacity

inducing predicate *believe* itself; the event position is thereby discharged outside the scope of *believe*.

Thus we derive the interpretation in (17) from the structure in (18) as follows. Assume that the event θ-position of the complement clause is not discharged by INFL (since it is not a root clause), nor by the complementizer *that* (which would δ-bind the event position and make the complement factive). The event position thus propagates up to the CP node of the complement clause. This is required as a consequence of the selectional properties of the propositional verb, which selects a complement with an open event position, CP<e> in (16). The event position of the complement clause is then discharged by the higher, propositional, verb. The binding of the event variable therefore occurs outside the context of referential opacity of the verb, allowing the speaker to have referential access to it. This makes the event position of the lower clause available to the speaker to quantify over it. Binding by the propositional verb existentially quantifies the event position over the domain M_E of events within John's mental model. Finally, we say that belief and other propositional attitudes are relations between John and parts of his mental model delineated by the event positions of the complement clauses of propositional attitude ascriptions. This allows us to identify the event variable in (17) as the object of John's belief. Thus the representation in (17) is derived from the event structure in (18).

The account is essentially the same for speech reports, such as in (25).

(25) John said / claimed [that Max visited London]

In these as well, the context of the higher verb is referentially opaque, but nevertheless the speaker can refer to an event or state within John's mental model. This is captured by using the event variable of the complement clause to refer to the event in John's mental model of the world. The event variable of the complement clause is then suitably bound by the higher verb outside the context of referential opacity. This binding is interpreted as existential quantification over events in M_E, and such events are taken to be the object of the speech ascription. This yields an interpretation exactly analogous to that for propositional attitude reports in (17).

(26) $[\exists e \epsilon M_E: \text{visit}(M,L,e)]\ \text{claim}(J,e)$

On this approach, propositions are dispensed with as intermediaries between John's mental states and the propositional attitude or speech ascription. In a propositional attitude or speech ascription, interpreted as in (17) or (26), John is put directly in a relation with the relevant aspect of his mental model. As a result, paraphrases like the following, while possible, are not indicative of actual semantic structure.

(27) a. John believes the proposition that Max visited London
b. John claimed that the proposition that Max visited London is true

Furthermore, the following sentences, which might be taken as evidence for the existence of propositions as the objects of belief, can be accommodated.

(28) a. What does John believe?
b. What did John claim?

(29) a. What John believes is that Max visited London
b. What John asserted was that Max visited London

(30) a. John believes that
b. John said that

In (28), *what* is to be identified with an event in M_E, which *believe* and *claim* relate John to. Likewise for the relatives *what John believes* and *what John asserted* in (29), and the demonstrative *that* in (30).

Melvold (1986) also presents an account in which the distinction between propositional and factive complements depends on the dispensation of the event position of the complement clause. On her account, the distinction is between this event position being existentially quantified out in a propositional complement, and bound by an iota operator in a factive complement. The complementizer of a factive complement performs a semantic function by inducing the insertion of the iota operator. However, there are some critical differences between Melvold's account and the one presented here. On Melvold's account, no distinction is made such as in the present account between the positions at which the event positions of propositional and factive complements are discharged. The event position of the propositional complement is quantified out within the complement clause on her account, contrary to the account given here. Finally, a factive complement on Melvold's account, with its event position bound by an iota operator, refers to the actual event involved. This blocks the extension of Melvold's account to response stance complements, to be considered in the next subsection, and it runs into some problems to be discussed in section 2.1.4 below.

2.1.2 Response stance complements

The proposal being made here is that the properties of p-complements and f-complements discussed here follow from the dispensation of the event θ-position (which is δ-bound in f-complements, but not in p-complements) rather than in an unanalyzed factive or propositional nature of these complements. This claim is supported by the fact that there are **non**factive verbs whose complements have the event structure of f-complements, and which share the distributional properties of f-complements considered here. Consider verbs like *accept, confirm, verify, deny,* and *doubt.* These were identified by Cattell (1978), who calls them **response stance verbs**, and will be designated here as r-verbs.

(31) r-verbs: accept, confirm, verify, deny, doubt

These are not factive, as can be seen clearly be embedding them under negation.

(32) a. They don't accept that loneliness causes cancer
b. They didn't confirm that loneliness causes cancer
c. They didn't verify that loneliness causes cancer

None of these presupposes that loneliness causes cancer; in fact, in plausible contexts for these sentences, the question of whether loneliness causes cancer is precisely what is at issue.[11] However, the r-verbs patterns

[11]However, that the presuppositions of the embedded sentences in (32) are preserved under negation when the embedded clause is extraposed, with an object expletive.

(i) a. They don't accept it that loneliness causes cancer
b. They didn't confirm it that loneliness causes cancer
c. They didn't verify it that loneliness causes cancer

with factives in taking a complement with an overt complementizer, as shown below.

(33)	They	accept	*(that)	loneliness	causes	cancer
		agree	??(that)	"	"	"
		confirmed	*(that)	"	"	"
		deny	?(that)	"	"	"
		doubt	?(that)	"	"	"
		verified	*(that)	"	"	"

Furthermore, as with factives, the complements of r-verbs can occur with an associated object expletive, and like factives, r-verbs do not generally take ECM complements.

(34) They (accept, agree to, confirmed, deny, doubt, verified) it that ..

(35)	They	*accept	the lake to be polluted
		*agree	
		??deny	
		??doubt	
		??confirmed	
		??verified	

On these grounds, we assign to r-complements the same event structure that we assigned to factive complements, as follows.

(36) agree [$_{CP<>}$ that [$_{IP<e>}$ Max loves Cecelia

Assuming that r-verbs select a CP<> complement with a closed event position, this structure accounts for the data in question. The presence of the complementizer *that* in (33) is required since the complementizer discharges the event position, and therefore performs a semantic function. Since the event position of the complement clause is discharged internally to the complement, the complement clause can occur dislocated from the object position of the r-verb, with an object expletive in its place. And

since the r-verb selects a CP<> complement with a closed event position, whereas ECM complements are of the form IP<e>, it follows that r-verbs don't take ECM complements.

Assuming, as with factive complements, that the complementizer *that* δ-binds the event position that it discharges, the structure in (36) yields the interpretation in (37).

(37) They agree that δe[love(Max, Cecelia,e)] holds

Since the event position is transparent, the δ-bound expression in (37) can be exported to yield the following.

(38) Regarding δe[love(Max, Cecelia, e)], they agree that it holds.

In (37) and (38), the state in question is not presupposed to actually hold: it is entirely possible for people to agree on something that is false. However, binding within the discourse frame does not require that the event in question actually occurred, or that the state in question actually holds. Binding within the discourse frame only requires the event or state in question to be at issue in the discourse.

In (37) and (38), δ-binding of the event/state position does not mean that Max actually loves Cecelia. It just means that there is an event or state in the discourse frame in which Max loves Cecelia. Such an event is present within the discourse frame if it is presupposed that Max loves Cecelia: this is what happens with factive complements. But such an event is also present in the discourse frame if the question of Max loving Cecelia

is at issue in the discourse, and not presupposed. This is the case with response stance complements. So the structure in (36), with the event position of a response stance complement δ-bound by the complementizer *that*, yields interpretations such as those in (37)-(38), which are exactly correct for response stance complements.

In summary, an event or state can be within the discourse frame because it is presupposed; for this reason, δ-binding is suitable for the event position of a factive complement. But also, an event or state can be present within the discourse frame because it is at issue in the discourse, whether or not it actually occurred; for this reason, δ-binding is suitable for the event position of response stance complements.

2.1.3 The complementizer in propositional complements

As illustrated in (3) and (33) above, the complementizer in factive and response stance complements is obligatory. This can be explained on the grounds that these complementizers are required to δ-bind the event position of the complement clause at LF. We have assigned no LF role to the *that* complementizer of propositional complement clauses. And in the complements of most propositional predicates, the complementizer need not appear. This can be seen by substituting any of the verb forms in (39b) for 'V' in the schema in (39a); the result is good whether or not the complementizer *that* is present.

(39)
a. John V [(that) [Martians are visiting Earth]]

b. assumes, believes, claims, concluded, decided, declared, feels, imagines, maintains, reckons, says, suggested, supposes, suspects, thinks

However, complementizers are required in the complements of a few propositional predicates. This is indicated in (40), where any substitution instance of a verb form in (40b) for 'V' in (40a) is bad without the complementizer *that*.

(40) a. John V [*(that) [Bill is a spy]]

b. asserted, conjectured, envisages, intimated, judges, proposed, speculated, stated

We have not proposed an LF role for the complementizer of a propositional complement. Since the complementizer in (39) is optional, we assume that it plays no semantic role. If this is true, then assuming the principle of Full Interpretation from Chomsky (1989),[12] it follows that the complementizer in (39), if present at S-structure, deletes at LF. Turning to (40), it is not clear why the complementizer should be obligatory in complements of these verbs. Presumably, these verbs, like other propositional predicates, take a complement clause with an open event position; the complementizer would therefore not be required for δ-binding of the event position. The complementizer might play some more fine grained role in the interpretation of these sentences, or it might be required for some purely grammatical reason which we haven't noticed, having nothing to do with the interpretation of these sentences. In the next chapter, support will be given for the assumption that when the complementizer is obligatory on the surface, it is present at LF. If this is true, then the complements in (40) have some subtle semantic difference

[12]Full Interpretation: An element is present at LF only if it plays a role at LF.

from those in (39) which requires the presence of the complementizer *that* at LF. What this property might be is not clear at this point.

2.1.4 Further properties of factive and response stance complements

Some residual issues concerning factive and response stance complements will now be addressed.

From the analysis developed here, it follows that sentential subjects must be factive, as in (41), or response stance, as in (42).

(41) a. [That John fixed the car] was fortunate
b. [That John committed the crime] affected us all
c. [That John succeeded] bothers/surprised Mary
d. [That John always loses] doesn't stop him from trying

(42) a. [That John wrecked the car] is impossible
b. [That John committed the crime] is impossible
c. [That John fixed the car] is false

In the position of a sentential subject, there is no predicate directly selecting the CP. Hence, in order for the structure to be good, the event position of the sentential subject must either be discharged internally to the sentential subject, or discharged externally by some means other than selection by a higher verb. The only mechanism available for internal discharge of the event position is δ-binding by the complementizer *that;* the sentential subject emerges as factive in this case.[13] The case of external

[13]There is, of course, another option for discharging the event θ-position internally to the sentential subject clause, namely θ-binding by the INFL of this clause. However, this operation seems to occur exclusively in root clauses, possibly from a unique association with the function of the root clause as assertive.

discharge of the event position can be realized if there is an adverb of quantification present. Then the event position of the sentential subject can remain undischarged within the clause and be unseletively bound by the adverb, as in (43) below. (See Heim 1982 for discussion of unselective binding by adverbs of quantification of variables in indefinites.)

(43) a. [That John fixed the car] was always fortunate
b. [That John won at tennis] always bothered Mary
c. [That John lost] always led him to insult Mary

(43a) can mean that each occasion of John fixing the car was fortunate, (43b) that each occasion in which John won at tennis bothered Mary, and so on. When a sentential subject *that* -clause raises to subject position, its factivity depends on the verb that selected it.

(44) a. [That John fixed the election]$_i$ is believed t_i by all
b. [That John fixed the election]$_i$ is claimed t_i widely
c. [That John committed the crime]$_i$ is regretted t_i by his friends
d. [That release of the hostages was fixed]$_i$ was mentioned t_i in the papers

The sentential subjects in (44a,b) are propositional, and those in (44c,d) are factive. Thus the property of the raised sentential subject is determined through its trace, or through its chain. In particular, the event position of the CP<e> propositional sentential subject in (44a,b) must be discharged through the trace. (We assume then that θ-role discharge is transmitted by an A-chain.)

Return to the sentences (8), repeated below, which seemed to defy the generalization that factive predicates don't take ECM infinitival complements.

(8) We know / recognize / find John to be insincere

If these were factive or response stance, their interpretation would be rendered as follows.

(45) We know / recognize / find δe[insincere(J,e)]

But this is incorrect. The state described by the complements in (8) is not within the discourse frame: it is being put forward by the speaker as an evaluation of John. The meaning of the sentences in (8) might be roughly captured by taking the complement to be propositional, since the evaluation of John is part of the mental model of the world held by the subject. But in any event, it would not be in the discourse frame, so there is no reason to regard the predicates in (8) as factive. Thus the sentences do not defy the generalization that factive predicates do not take ECM infinitival complements.

Some comments are in order concerning the analysis of factivity developed here. On this analysis, a factive complement clause has its semantic value computed in terms of δ-binding of its event position, as in (46) below.

(46) a. John believes that Max visited London
b. δe [visit(Max,London,e)]

The expression in (46) is a definite description of an event: it denotes the event corresponding to the file card in the discourse frame which has the entries "is an event" and "is the event in which i visited j", where *i* is the index of the file card for Max, and *j* is the index for the file card for

London. More casually, the expression in (46b) denotes the event within the discourse frame in which Max visited London. With the semantic value of the complement expressed in terms of the definite description in (46b), the factive complement induces the presupposition of a definite description, namely, the presupposition that there is a unique entity within a relevant domain satisfying the description, in this case, a unique event within the discourse frame. This reduces the factivity of the factive complement to a presupposition, particularly, to the presupposition of a definite description.

Note that the complement of a factive verb is not event-denoting; it is only being claimed here that this complement induces a presupposition. What one realizes, recognizes, points out, or knows, is not an event, but rather the fact that a particular event occurred. Consider the sentence in (47).

(47) John recalls that Mary denounced Bill

If what John recalls in (47) is the event in which Mary denounced Bill, then the complement in (47) has the same semantic value as that of the gerund complement in (48).

(48) John recalls Mary's denouncing Bill

But this is not right. (47) can be true if John only heard that Mary denounced Bill, even if John did not witness the event himself. Provided that the event actually occurred, and that the occurrence of the event is causally related in the right ways to John's hearing about it, it follows that

(47) is true.[14] But (48) is true only if John recalls the actual event, through having witnessed it himself or through direct acquaintance with its consequences. The same problem can be raised, but in a way relating to ungrammaticality, by noting that there are contexts in which a factive *that* -clause cannot be substituted for an event denoting expression, as in the following pair, from Peterson (1979).

(49) a. Mary's refusal of the offer was followed by silence
b. * That Mary refused the offer was followed by silence

So the semantic value of a factive complement cannot be, strictly speaking, an event. It must be the fact that an event occurred. But none of the combinatorial mechanisms being developed here is affected by these remarks, and the general point remains that δ-binding within the factive complement induces a presupposition, out of the structure involved, and that this presupposition is expressed as a definite description (of a fact, as it happens), so that the factivity of the factive complement reduces to the factivity of a definite description.[15]

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[14]The right kind of causal relation is required since, if John comes to believe that an event of Mary denouncing Bill occurred, but the way in which John comes to this belief is accidental or fortuitous, in some way unrelated to the actual occurrence of the event, then John cannot be said to know (or to have known) that this event occurred, and therefore cannot be said to recall it.

[15]An attractive alternative would be to assume that it is a contribution of the higher, factive, predicate, to compose 'δe[visit(Max,London,e)]' from (46) into 'the fact that the event e occurred wherein Max visited London'. Then the *that* -clause factive complement would have intrinsically the semantic content of a definite description of an event, and the context of the factive predicate would convert this into a definite description of a fact. But then the *that* -clause sentential subject in (49b) would denote an event, which wrongly predicts that (49b) should be grammatical. The sentence (49b) is out on the grounds that the *that* - clause denotes a fact, whereas the context of (49b) demands an event denoting subject (at least, that is the explanation being adopted here). To maintain this explanation under the assumption that the *that* -clause is intrinsically event denoting, we would have to assume that something in the context of (49b), and any similar examples we could find, converts an event denoting definite description into a fact denoting one. But then this conversion must be effected independently in a variety of

2.2 The Event Structure of Infinitival Complement Clauses

In this section, the event structure of infinitival complement clauses will be examined. Three classes of infinitival complements will be identified, based on their event structure, namely, propositional infinitive complements, irrealis event complements, and factive (or implicative) complements.

2.2.1 Nonimplicative (propositional and "irrealis") infinitivals

In infinitive complements, there is no [Tns] morpheme and no *that* complementizer to discharge the event position. Thus, we would expect the event position to be projected up to the bounding node of the infinitive complement. This seems to be the case for a variety of infinitive complement types. These include the following, classified into the verb classes identified by David Pesetsky (Class lectures, Fall 1988).

(50) *believe* class
Mary believes [Bill to have shredded the documents]

other verbs: consider, imagine, suppose, suspect, figure, presume, expect

(51) *want* class
Mary wants [Bill to shred the documents]
Mary wants [PRO to shred the documents]

other verbs: desire, wish, prefer

(52) *try* class
Mary tried [PRO to shred the documents]

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apparently unrelated contexts. Thus, there is reason to assume that the *that* -clause is intrinsically fact denoting. Then the explanation for (49b) follows automatically.

other verbs: arrange, decide, endeavor, hope, need, prepare, refuse

In (50), Mary believes that some event or other occurred in which Bill shredded the documents. This is the sort of interpretation that was encountered in the previous section with tensed complements and identified as propositional. Thus, the event position of the complement clause is projected up to the bounding node of the complement; assuming a standard "S-bar deletion" structure, this would be IP. So the complement clause is of the form IP<e>, and the event position of the complement is θ-bound by the higher verb. This induces an interpretation such as the following.

(53) $[\exists e \epsilon M_E$: shred(B,d,e)] believe(M,e)

M = Mary's mental model
M_E = the set of events in Mary's mental model

As argued by Pesetsky (Class lectures, Fall 1988), *want* or *try* expresses an attitude towards an irrealis event. In (51), Mary wants some (currently) irrealis event to be realized, and in (52), Mary tried to realize some irrealis event. Pesetsky argued that these complements take a null prepositional complementizer, *for,* which is an optional governor, shielding a PRO subject from government by the higher verb (minimality, or relativized minimality), and which assigns accusative case to an overt subject. If this is correct, then these complements are CPs, introduced by the prepositional complementizer. If the prepositional complementizer were to have no effect on the event position, then the complements in (51) and (52) would be of the form CP<e>, and hence would be propositional. This would obliterate any distinction in semantic argument type between the irrealis complements in (51) and (52) and the propositional complements in (50). Suppose

instead that *for* selects an IP<e>, and that *for* θ-binds the open event position in its complement. The resulting structures are then of the following form, where the parenthesized *for* in (54b) must be phonetically null.

(54) a. Mary wants [$_{CP<>}$ for [$_{IP<e>}$ Bill to shred the documents]]
b. Mary wants [$_{CP<>}$ (for) [$_{IP<e>}$ PRO to shred the documents]]

As a lexical property of *for*, the IP<e> complement of *for* with its event position bound by *for* will not be interpreted as propositional, but rather as irrealis event denoting.

2.2.2 Implicative infinitivals

Certain infinitival complements defy the expectation arrived at in 2.2.1 that infinitival complements should be propositional or irrealis. These include complements of the following verbs.

(55) perception verbs: *see, watch, hear, feel*

a. John saw [Mary leave]
b. John heard [Mary enter the room]

(56) *make*

a. John made [Bill leave]
b. John made [Bill angry]

(57) *cause*

John caused [Bill to lose the race]

(58) *manage*

John managed [PRO to enter the barn]

These can be used when the complement describes an event that has already been established within the discourse frame. However, they can also be used to introduce the event described within the complement. Thus, we will assume that no presupposition is induced by the event structure of the complement. That this is correct is indicated by the fact that no presupposition induced by the event structure of the complement is preserved under negation in these sentences (as pointed out to me by Howard Lasnik, p.c.). Contrast the implicative under negation in (59a) with the factive under negation in (59b).

(59) a. John didn't see [Mary leave]
b. John didn't notice [that Mary left]
c. We don't like it [that Mary left]

The presupposition that Mary left is preserved under negation in (59b,c), but (59a) could be used to describe a situation in which John has been watching the exit, and Mary never left. As it happens, (59a) can also be used when it is presupposed that Mary left, but this seems to be a nonstructural matter, with the presupposition generated on purely pragmatic grounds in such cases.

The complements in (55) are naked infinitive complements; they have no inflection at all. For present purposes, the naked infinitive can be analyzed as a small clause, that is, as a direct projection of its predicate.

For the perception sentences in (55), the analysis of Higginbotham (1983) will be adopted here, revised slightly to put it within the framework of his later papers. The following three desiderata, from Barwise (1981)

(with (IIIb) added by Higginbotham), repeated from (20) above, are taken as criterial for the analysis.

(60)

(I) *Veridicality:* If the complement is quantifier-free and S is a full clause, taking its tense from the matrix, and expressing the content of the complement, then the sentence as a whole entails S.

(II) *Principle of Substitution:* The context of the complement is referentially transparent (in the sense of Quine 1960, p.144).

(III) *Exportability of Quantifiers:* Conditionals of the following sort are true:

a. If John saw somebody leave, then there is somebody who John saw leave.

b. If John saw nobody leave, then there is nobody who John saw leave.

Note that these hold for the perception sentences in (55). If the sentence in (55a) is true, then: (I) *Mary left* is true; (II) If Mary happens to be a spy, whether or not John knows that Mary is a spy, the sentence *John saw a spy leave* is also true; and the conditionals in (III) are true.[16] On Higginbotham's analysis, the naked infinitive complement is interpreted as inducing a restricted existential quantifier over the event variable introduced by the verb of the complement, as shown in (61a), where this variable itself is the semantic argument of the perception verb; putting this within the semantic context of the entire perception sentence, with an existential quantifier over the event position of the matrix clause, gives (61b) (ignoring tense).

(61) a. [∃e: leave(Mary,e)]

b. ∃e' [∃e: leave(Mary,e)] see(John,e,e')

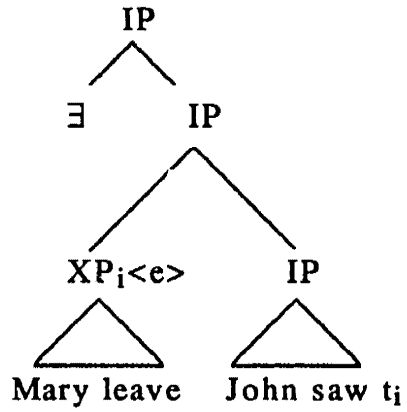
[16]This is not true of tensed and full infinitival complements of *see*. If *John saw that Bill was arrested* is true, and Bill happens to be a spy, it doesn't follow that *John saw that a spy was arrested* is true.

This interpretation can be obtained compositionally if the perception verb complement is treated as an indefinite description of the event corresponding to the event position of its verb. Under the existential interpretation of indefinites, the naked infinitive complement raises to the matrix IP, after which we have the following structure, where XP is the category of the naked infinitive.

(62) $[_{IP}\ [_{XP<e>}$ Mary leave$]_i\ [_{IP}$ John $[_{I}\ [+Tns]]\ [_{VP<e'>}$ saw $t_i\ ]]]$

At this point,we need to say how the quantificational structure over the event variable *e* of the naked infinitive complement is established. We will appeal to the analysis of Heim (1982, chapter II, p.138) in which an unindexed quantifier ∃ is adjoined to the nuclear scope of every quantifier. This would introduce ∃ adjoined to the higher segment of IP in (62) if there were a higher quantifier to license it on Heim's analysis. But there is no higher quantifier in (62) because there is no overt quantifier at all in the sentence (61a). However, the [+Tns] morpheme in INFL introduces existential quantification over the event variable of the matrix verb, and the raised constituent XP<e> is within the m-command domain of INFL. Thus, XP<e> in (62) is effectively within the scope of the quantifier induced by θ-binding of e'. I'll assume that this licenses the introduction of the unindexed quantifier ∃ in (62), yielding (63).

(63)



The unselective quantifier ∃ in (62) can then bind the open variable in the raised naked infinitive [$_{XP<e>}$ Mary leave], yielding the restricted quantifier in (61a). The interpretation of (63) is then (61b).

The analysis of (55) as an indefinite is strengthened by the fact that, in the presence of an adverb of quantification, the naked infinitive complement participates in unselective binding. Thus, the sentence (64a) has the interpretation in (64b).

(64) a. John rarely saw Mary leave
b. rarely(e)[leave(Mary,e)] ∃e' saw(John,e,e')

The interpretation in (64b) can be obtained analogously to other cases of unselective binding, discussed in Heim (1982), provided that the event variable of the naked infinitive complement is an open variable intrinsic to this complement. That this will be the case is assured by the lack of potential θ-binders of the event position within the naked infinitive complement.

The desiderata in (60) follow directly from the analysis in (61b). The property in (I) follows since anything of the form ∃x[A(x)] B(x), entails

$\exists xA(x)$. The property in (II) follows since if the position of an NP α is referentially transparent in A(x), then the position of α is referentially transparent in $\exists x$[A(x)] B(x). Finally, from $\exists x[\exists yA(x,y)]$ B(x), it follows that $\exists y\exists x$[A(x,y)] B(x), so (III) holds.[17]

Note that the desiderata in (60) hold for the sentences in (56)-(57) as well. This suggests that the analysis of perception sentences given in (61) be extended to these sentences as well. The mechanisms would be the same: the event position would remain undischarged within the complement clause, and would thus remain as an open variable, allowing for an interpretation of the complement as an indefinite. In the presence of an adverb of quantification, the event position of the complement in (56)-(58) can be bound by this adverb.[18]

(65) a. John always made Bill leave
b. always(e) [leave(Bill,e)] make(John, e)

(66) a. John always caused Bill to lose the election
b. always(e) [lose(Bill,the election,e)] cause(John,e)

Note that these complements, even the full infinitivals, are distinguished from propositional complements in that the higher verb in (55)-(58) does not discharge the event position of its complement clause. Having its event position bound by a higher verb is the hallmark of a propositional

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[17]*John saw nobody leave*, after quantifier raising, would be
(i) ~$\exists$x[John saw x leave]
Interpreting the bracketed expression in (i) yields
(ii) ~$\exists x\exists e'$ [$\exists$e: leave(x,e)] see(J,e,e')
The condition (IIIb) can be derived from this together with (IIIa).

[18]The representations in (65b) and (66b) are written assuming that causative verbs like *cause* and *make* introduce no event variable of their own. This is an open question that will not be settled here. If they do have an event variable of their own, it would be quantified out in the nuclear scopes in (65b) and (66b), and would not impinge on the present discussion.

complement, and this discharge prevents the interpretation of the complement as an indefinite. Thus, the matrix verb conditions the availability of the interpretation of an infinitive or naked infinitive complement as an indefinite description of an event. If the verb selects an open complement of the form XP<e>, but does not θ-bind its event variable, then this event variable remains open, and the complement can raise and be interpreted as an indefinite.

Complements of *manage,* in (58), behave differently. The event of managing to do X is the same event as doing X, suggesting that the event positions of the complement and matrix should be identified. Assume the infinitive complement of *manage* with its open event position raises at LF and adjoins to the matrix VP, where its event position is θ-identified with the matrix event position. Then the contents of the complement clause are asserted to occur as much as the contents of the matrix; this captures the fact that *manage* is implicative. Furthermore, identification of the event position of the infinitive complement of *manage* with the matrix event position, and its subsequent binding by the matrix INFL, blocks the possibility of quantificational variability. This is empirically correct.

(67) a. John always managed to meet Bill
b. always(e) [meet(John,Bill,e)]

The sentence in (67a) doesn't mean that on each occasion of meeting Bill, John always managed it. Rather, (67b) means that on each occasion of a given or understood sort (say, of Bill coming to town), John managed to meet Bill. Thus *always* in (67a) implicitly quantifies over those given or understood occasions, not over occasions of John meeting Bill.

Appendix to 2.2.2: Response to Neale (1988)

In deferring to Higginbotham (1983) for an account of (55)-(58), there arises the necessity to address the critique of HIgginbotham's article published in Neale (1988). A number of Neale's criticisms concern the inexplicitness of mechanisms in the 1983 account, but these are mostly remedied in the subsequent publications Higginbotham (1985, 1989). For example, Neale points out the lack of an explicit derivation of the truth conditions in (61b) from the LF in (62). But such derivations were provided above using material from Higginbotham and Heim. To take another instance of this sort, Neale argues that Higginbotham' account cannot derive a representation for the reading of (68) below where what John sees is a single scene in which the students all leave.

(68) John saw every student leave

However, this is mistaken. If the quantifier *every student* raises and adjoins to the naked infinitive complement, and then the naked infinitive raises and adjoins to the matrix IP, we get the LF in (69) below.

(69) $[_{IP}\ [_{XP<e>}\ [_{NP}$ every student$]_i\ [_{XP}\ t_i$ leave$]_k]\ [_{IP}$ John saw $t_k\ ]]$

In (69), the event variable of the naked infinitive remains open on the highest segment of the XP boundary node of this constituent. Thus, the entire complex XP is an indefinite, and the unbound variable must be quantified out above the highest segment of the XP node. Thus, the quantifier *every student* adjoined to XP will not suffice to license an unselective $\exists$ quantifier for the interpretation of the indefinite. The only

quantifier in the sentence with scope over the higher segment of XP is the existential quantifier introduced by the matrix INFL, which binds the event position of the matrix verb. Thus an unselective ∃ quantifier must be introduced adjoined to the matrix IP, above XP. This quantifier will bind the open event variable of XP<e>, yielding the interpretation in (70).

(70) ∃e' [∃e: [∀x: student(x)] leave(x,e)] saw(John,e,e')

This is precisely the desired interpretation.

Other problems raised by Neale can be dealt with using the same resources. A major one concerns sentences with negation, such as the following.

(71) a. John saw Mary not raise her hand
b. John saw Mary not leave

As recognized by Higginbotham, this cannot be captured by placing an overt negation at any point in the semantic representation of the corresponding sentence without negation; attempts to do so would yield the representations in (72).

(72) a. ∃e[~raise(Mary,her hand,e)] John saw e
b. ∃e[raise(Mary,her hand,e)] ~John saw e
c. ~∃e[raise(Mary,her hand,e)] John saw e

(71) means that John saw Mary on an occasion in question, and Mary was not raising her hand. None of (72a,b,c) can capture this meaning since none of them requires John to have seen Mary (on the relevant occasion). (72a) is true whenever John saw some event that was not of Mary raising

her hand. (72b) asserts that there was an event of Mary raising her hand, but that John did not see it. As a representation of (71), this asserts both too much and too little: (71) does not require that there be an event of Mary raising her hand, but it does require that John see Mary. Finally, (72c) is true if John saw nothing, and so does not require John to see Mary.

Higginbotham (1983) suggests a solution to this problem based on identifying antonymic predicates, a solution which Neale finds ad hoc. But a perfectly natural solution is available in terms of constituent negation of VP, using the semantic representations of Schein (1986), used in Higginbotham (1989). Consider (71b) for illustration. Decomposing the predicate *leave* into a base $leave_o$ and the thematic roles of its (NP) arguments, we have

(73) $\text{leave}(x,e) \leftrightarrow \text{Agent}(x,e) \,\&\, \text{leave}_o(e)$

The negation in (71) is a constituent negation of VP, which applies only to the root V_o. The truth conditions of (71) can then be written as follows.

(74) $\exists e' \, [\exists e: \text{Agent}(\text{Mary},e) \,\&\, \sim\text{leave}_o(e)] \, \text{saw}(\text{John},e,e')$

This means that John saw an event of which Mary was the agent, and that it was not an event of leaving, the required interpretation.

Another problem raised by Neale concerns the trigger for raising an infinitive complement. This seemed like a problem within the 1983 account since Higginbotham assumed there that event variables were present only in naked infinitive complements, and that therefore the presence of an event

variable triggered raising of the complement clause. But within the context of the present chapter, a principled answer can be given in the framework of Higginbotham (1985, 1989), using the analysis of indefinites in Heim (1982). The complements that raise are ones with an open event position which is not discharged by the higher verb. In order for this event position to be bound, there is no other option available than for the complement to raise and be interpreted as an indefinite in these cases.

2.3 The Event Structure of Gerunds

To begin with, four sorts of gerund will be identified. The first three categories are standardly named and discussed in the literature (Chierchia 1984, Abney 1987, Zucchi 1989); the fourth kind was identified at least by Abney (1987). The two sorts of ing-of gerund in (75) will be collapsed together.

(75) ing-of
a. John's drinking of the coffee
b. the drinking of the coffee

(76) POSS-ing
John's drinking the coffee

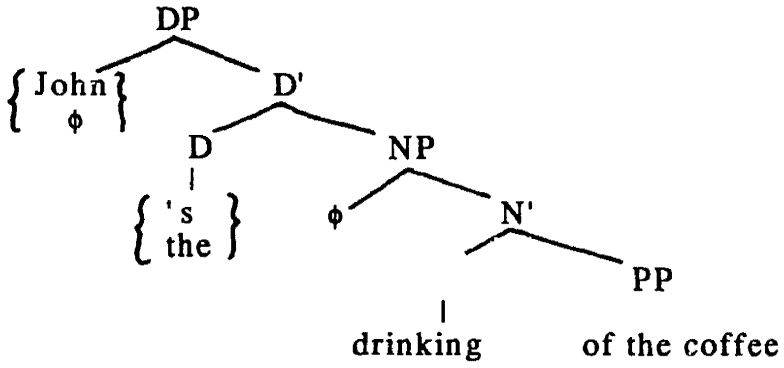
(77) ACC-ing
John drinking the coffee

(78) PRO-ing
PRO drinking the coffee

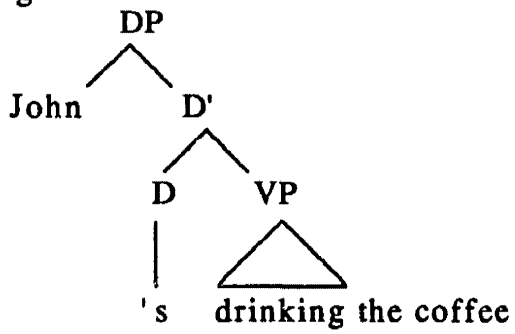
For the gerunds in (75), the structure in (79) will be adopted here, and for those in (76), the structure in (80). [19]

[19]In (80), spec-VP is indicated as being either empty or as containing a subject trace. If spec-VP is empty, it is also possible that it is not projected at all.

(79) ing-of



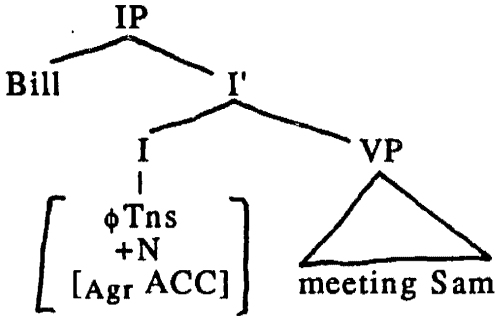
(80) POSS-ing



These are close to the structures adopted by Abney (1987), and the fairly extensive argumentation given there will justify most aspects of these structures.

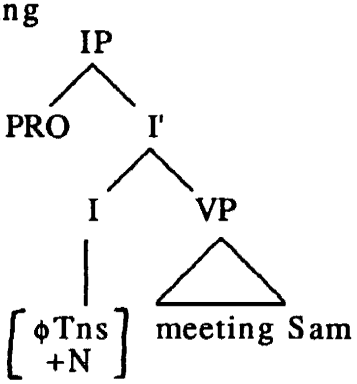
For ACC-ing gerunds, I will assume the structure in (81) below.

(81) ACC-ing



This shares with Abney's analysis (and many others) the presence of clausal structure above the verb. The tense in T is null, and T is marked with a nominalizing feature [+N]. For the PRO-ing gerund, the following structure will be adopted here.

(82) PRO-ing



These phrase structures will be assumed without further discussion, as we turn now to the event structure of these gerunds.

To begin with, note that all four gerund types have instances in both subject and object positions which can be interpreted as definite.

(83) a. [John's/the sighting of a raccoon] surprised us
b. [John's sighting a raccoon] surprised us
c. [John sighting a raccoon] surprised us
d. [PRO sighting a raccoon surprised us

(84) a. We watched [John's/the building of a model]
b. We watched [John's building a model]
c. We watched [John building a model]
d. We remember [PRO building a model]

All of the gerunds in (83)-(84) can be interpreted as having the same reference as a definite description of an event. This follows if each of these gerunds has the resources to internally δ-bind an event, which in turn

follows if each contains a δ-binder. The ing-of and POSS-ing each have a determiner head which can plausibly act as a δ-binder; this is supported by the intuition that in bottom-to-top composition in these gerunds in (83)-(84), reference to a unique event is established at the determiner. In the ACC-ing and PRO-ing gerunds, the candidate for δ-binder is less obvious; I'll assume that the [+N] head I is capable of performing this function.

Each of the gerunds has occurrences as an indefinite in both subject and object positions.[20]

(85) a. [Bill's/the singing of that song] attracted the attention of *Rolling Stone* on one occasion

b. [Bill's singing that song] attracted the attention of *Rolling Stone* on one occasion
c. [Bill singing that song] attracted the attention of *Rolling Stone* on one occasion
d. [PRO singing that song] attracted the attention of *Rolling Stone* on one occasion

(86) a. John enjoyed [Bill's/the singing of that song] on one occasion
b. John enjoyed [Bill's singing that song] on one occasion
c. John enjoyed [Bill singing that song] on one occasion
d. John enjoyed [PRO singing that song] on one occasion

---

[20]Portner (1991) denies that subject gerunds can be interpreted as indefinites, but the examples he cites, given in (i) below, do not warrant this conclusion.

(i) a. Lifting those clocks didn't tire me out
b. If planting cacti tired Sam out, he will surely die

In (ia), the indefinite interpretation is not pragmatically salient since the cumulative effect of lifting many clocks is more likely than some particular event of lifting to tire one out. Consider instead the gerund in (ii).

(ii) It is not the case that lifting the clock broke it; something else did

This can deny that many liftings through an extended episode of liftings of the clock had the cumulative affect of breaking it, or it can deny that some particular lifting in an episode of many liftings broke it. The gerund is an indefinite in the latter interpretation. In (ib), the predicate *tire* is again at fault. Replacing it with something that is more readily realized in a single planting among many allows the gerund to be indefinite, as in (iii).

(iii) If planting cacti disturbed the sewer line, ...

This can be used if one slip of the shovel disturbed the sewer line, and then the gerund is indefinite.

This can also be seen in the context of quantificational variability, as follows.

(87) a. [Bill's/the singing of that song] rarely attracted the attention of *Rolling Stone*
b. [Bill's singing that song] rarely attracted the attention of *Rolling Stone*
c. [Bill singing that song] rarely attracted the attention of *Rolling Stone*
d. [PRO singing that song] rarely attracted the attention of *Rolling Stone*

(88) a. John rarely enjoyed [Bill's/the singing of that song]
b. John rarely enjoyed [Bill's singing that song]
c. John rarely enjoyed [Bill singing that song]
d. John rarely enjoyed [PRO singing that song]

As a suitable background for the interpretations of these gerunds as indefinite, suppose that Bill has been singing the song in question repeatedly, several times a day, for the past month. In this context, (85) can mean that some event or other of Bill singing the song attracted the attention of *Rolling Stone* magazine, and (86) can mean that John enjoyed some event or other of the many in which Bill sang the song. Assuming Heim's (1982) approach to indefinites, the interpretation of the gerunds in (85)-(86) as indefinite involves the gerund having an open event position, being raised to IP where an unselective quantifier $\exists$ is projected above it, where $\exists$ then binds the open event position of the gerund. To be interpreted as indefinites on this account, the gerunds in (85)-(86) must be of the form XP<e>. This can be obtained if each of the δ-binders in these gerunds can exercise the option not to bind the event position of the gerund, which we will now assume to be the case. There is an exception to the availability of indefinite interpretation for gerunds, namely, when ACC-ing and PRO-ing gerunds occur as objects of a propositional verb (p-verb), as below. (This is discussed in Portner 1991.)

(89) a. John imagines [Bill drinking hemlock]
b. John imagines [PRO drinking hemlock]

As Portner notes, these do not mean that there exists some event or other that John imagines, as is the case with ing-of and POSS-ing gerund objects of *imagine*.

(90) a. John imagines [Bill's/the drinking of hemlock]
b. John imagines [Bill's drinking hemlock]

With the definite determiner introducing the gerund, (90a) means that there is a particular event of drinking hemlock, which John imagines. (90b), and (90a) with *Bill's*, mean that for some event or other in which Bill drinks hemlock, John imagines that event. Thus the exceptions in (89) to the pattern of availability of indefinites is to be noted. It will be taken up and explained below in conjunction with a related issue.

As objects of a propositional verb, ACC-ing and PRO-ing gerunds can be interpreted as propositional, but ing-of and POSS-ing gerunds cannot.

(91) a. John thought about [Bill's/the winning of the Boston Marathon]
b. John thought about [Bill's winning the Boston Marathon]
c. John thought about [Bill winning the Boston Marathon]
d. John thought about [PRO winning the Boston Marathon]

In (91a,b), the gerund can be interpreted as definite, denoting a particular event in which Bill won the Marathon, or as indefinite, denoting some event or other in which Bill won the Marathon. But they cannot be interpreted as propositional, meaning that John imagined that Bill won the Marathon. But the gerunds in (91c,d) can be propositional (although they

need not be): (91c) can mean that John imagined that Bill won the Marathon, and (91d) that John imagined that he-himself won the Marathon.

The propositional interpretation is obtained as follows. The gerund sits in place (it does not raise), and its internal δ-binder (the determiner in ing-of and POSS-ing gerunds; the [φTns,+N] head I in ACC-ings and PRO-ings) exercises the option of not δ-binding the event position of the gerund. Then the event position of the gerund is unbound, and the gerund emerges as XP<e>. If the gerund is the object of a higher propositional vero, then this verb can discharge the open event position of the gerund, giving it a propositional interpretation.

It looks like the same thing could happen in ing-of and POSS-ing gerunds. If the determiner exercised the option not to δ-bind the event position of the gerund, then the gerund would emerge as DP<e> and could be taken as a propositional complement of a propositional verb. Yet we found in (91a,b) that these gerunds are not propositional. In order to explain why ing-of and POSS-ing gerunds cannot be propositional, suppose that nominal arguments (in A-positions) must be closed categories.[21] Since ing-of and POSS-ing gerunds are DPs on the structures adopted here, and hence nominal, they cannot occur in an argument position with an open event position; therefore, they cannot be interpreted

[21]Higginbotham (1985, 1989) assumes that arguments must be closed categories. We have departed from this assumption in analyzing propositional CPs to have an open event position. However, we made this departure in the context of a theory in which the open event position of a propositional CP was discharged syncategorematically in semantic composition with the propositional verb. Therefore, we have not embraced the possibility of arguments having open positions in general. The present assumption recovers Higginbotham's assumption for nominal arguments.

as propositional. A DP<e> ing-of or POSS-ing gerund which raises and adjoins to IP, where it can be indefinite or participate in unselective binding by an adverb of quantification, is allowed since then the DP<e> is in an A'-position.

In subject position, all four gerunds can participate in unselective binding of their event position by an adverb of quantification. The gerund DP<e> or IP<e> raises at LF and adjoins to the higher IP.

(92) a. [John's/the singing of that song] is always fun
b. [John's singing that song] is always fun
c. [John singing that song] is always fun
d. [PRO singing that song] is always fun

In object position, ing-of and POSS-ing gerunds can generally have their event position unselectively bound by an adverb of quantification.

(93) a. We rarely watch/imagine [Bill's/the running of the Boston Marathon]
b. We rarely watch/imagine [Bill's running the Boston Marathon]

However, ACC-ing and PRO-ing object gerunds occurring within the context of an adverb of quantification exhibit a split, depending on whether the selecting verb is propositional. The event position of ACC-ing and PRO-ing gerunds can be bound by an adverb of quantification when the gerund is the object of a non-p-verb, but not as the object of a p-verb.

(94) a. We always watch [Bill running the Boston Marathon]
b. We always resented [PRO finding the neighbors dog in our garden]
(95) a. We always imagine [Bill running the Boston Marathon]
b. We always think about [PRO running the Boston Marathon]

The fact that ACC-ings and PRO-ings cannot enter into unselective binding of their event position by an adverb of quantification when they are objects of a p-verb patterns with the fact noted earlier that exactly these two gerunds cannot be indefinite when they are objects of p-verbs. These facts can be explained if it can be maintained that an IP<e> must remain in-situ. From this it follows that if an IP<e> can be interpreted propositionally, then it must be so interpreted, since the only other opportunities for interpretation available to a gerund XP<e> are to raise and be interpreted as indefinite or as (having their event position) quantified out by an adverb, and raising of IP<e> is blocked, by hypothesis. The principle that IP<e> must remain in-situ follows from a general principle. Quite standardly, there is no exportation of an indefinite out of a referentially opaque domain, as illustrated in (96a) below; compare with the definite in (96b).

(96) a. John imagined [a man riding a purple horse]
b. John imagined [Bill riding on Air Force One]

Correspondingly, there is no exportation of an indefinite when it constitutes an opaque domain; this is illustrated in (97).

(97) a. John imagined a unicorn
b. John imagined an even prime number greater than 2

When an ACC-ing or POSS-ing IP<e> occurs as object of a propositional verb, it is the opaque domain of that verb. By the principle just discussed, it cannot be exported, so it must remain in-situ.

The data examined in this section is summarized in (98).

(98) Summary

Definite subject: All
Definite object: All

Indefinite subject: All
Indefinite object:
of non-p-verb: All
of p-verb: All except ACC-ing, PRO-ing

Propositional: ACC-ing, PRO-ing

Quantificational variability in subject: All
Quantificational variability in object:
of non-p-verb: All
of p-verb: All except ACC-ing, PRO-ing

The availability of δ-binding internally to gerunds implies, on the account developed here, that they should be able to occur as complements of factive verbs. This is borne out.

(99)
a. John mentioned/forgot ... [Bill's/the running of the marathon]
b. John mentioned/forgot... [Bill' running the marathon]
c. John mentioned/forgot... [Bill running the marathon]
d. John mentioned/forgot... [PRO running the marathon]

The possibility which gerunds of each type have to emerge with an open event position implies that they should be able to occur as complements of p-verbs. This is only partially borne out: there is variation across the p-verbs, as shown in (100).

(100)
p-verbs that take gerund complements: *assume, consider, envisage, fancy, feel, imagine, propose, suspect, think*

p-verbs that don't take gerund complements: *allege, assert, believe, claim, conclude, conjecture, decide, declare, figure, reckon, say, state, suggest*

The p-verbs that take gerunds are all verbs that ascribe a mental state; however, not all such p-verbs take gerunds: note *believe, decide, figure, reckon*. All verbs of stating or communicating fail to take gerunds. I have no explanation for these facts. Some, but not all of the p-verbs which take a gerund require a preposition to accompany the gerund, presumably to case mark it.

2.4 The Structural Generation of Some Other Presuppositions

In this section, a number of standard contexts of presupposition will be examined, and the generation of the presupposition will be detailed in terms of the structural operation of δ-binding of an event variable. The adjunct extraction properties of these contexts will be examined in chapter 3 and will be seen to depend on the structural conditions examined below underlying the generation of the presuppositions. It should be stressed at this point that what is being offered here is a structural theory of **presupposition generation**, and a reduction of a variety of presuppositions to the presupposition involved in definite descriptions. A theory of what presuppositions **are** is not being offered here, and in particular, no stance will be taken, or need be taken here, on whether presuppositions are ultimately a semantic or a pragmatic phenomenon. The significance of what is said here for our conception of presuppositions, and for some of their classical properties, such as their defeasibility and their capacity to project, will be discussed in section 2.5

2.4.1 Temporal adverbial clauses

Temporal adverbial clauses introduced by *before, after,* and *while,* involve a presupposition as to the existence of the event described in the adverbial clause.

(101) a. John finished his paper [before Mary arrived]
b. John joined the Communist Party [after he met Bill]
c. John shredded the documents [while Bill stalled the reporters]

The target semantic representation for these sentences is as given in (102).

(102) ∃e [finish(John,his paper,e) & before(e,δe'[arrive(Mary,e')])]

For the moment, our concern is the generation of the presupposition indicated in the second argument of the temporal adverbial. Suppose that the temporal adverbial δ-binds the event position of its complement.[22] Then the expression δe'[arrive(Mary,e')] in (102) can be taken straightforwardly as an argument of the temporal adverbial. The event position of the adverbial clause cannot be discharged by its INFL, since the clause is not a root clause. Therefore there is no way for the event position of this clause to be discharged internally to it, so the event position emerges on the maximal projection of the complement clause where it is δ-bound by the temporal adverb. The resulting structure is given in (103).

---

[22]See Lasnik and Saito (1991) for arguments that the adverbial clauses in (101) are CPs, with the temporal adverbial in C. Thus the structure of the adverbial phrase in (101a) is the following.
(i) [CP before [IP Mary arrived]]
Then the assumption is that the temporal adverb in C δ-binds the event position of the adverbial clause projected on the IP node, yielding the following structure.
(ii) [CP<> before [IP<e> Mary arrived]]

(103) John finished his paper [CP<> before [IP<e> Mary arrived]]
|_____↑

This structure will be referred to in Chapter 3.

2.4.2 Change/continuation of state verbs

Verbs such as *stop, begin, start, finish,* expressing change or continuation of state, involve some presuppositions. First consider the following.

(104) a. John stopped drinking coffee before bed
b. The army finished killing schoolteachers

These assert that the activity expressed in the gerund came to an end, and they presuppose that the activity expressed in the gerund had been going on up until the time associated with the matrix verb. So (104a) presupposes that John was drinking coffee up until the time he stopped, and so on. Thus, the sentences in (104) can be represented as in (105).[23]

(105) a. John stopped δe[drinking(PRO,coffee,e)
& before(bedtime,e)]

---

[23] In order to represent these more precisely, it might be desirable to render the PRO-ing gerund in (104a) along the lines of Parsons' (1990) treatment of the progressive as follows, where *t* is a time variable.

(i) ∃t[drinking(e) & Agent(e,John) & Theme(e,coffee) &Hold(e,t)]

The dispensation of the unbound event variable in (i) is as discussed in section 2.3 above. Further specification of *t* in (i) depends on the tense of the sentence in which the gerund is embedded. The first three conjuncts in (i) amount to a thematic decomposition of the verb such as was employed in the appendix to section 2.2.2 under slightly different notation (V_0 for V-ing); the last conjunct indicates that the event characterized as a drinking holds at the time t. The representation in (i) can then be paraphrased as follows: there was an event of drinking, involving John as agent and coffee as theme, and it was going on at time t, specified further according to the tense of the embedding clause. This fuller representation won't be needed for the purposes of this chapter-- the representations in (105) will be adequate.

b. The army finished δe[killing(PRO,schoolteachers,e)]

With verbs such as *stop*, the gerund complement expresses a presupposition, analyzed here as the presupposition induced by the δ-operator, which acts like a definite description of events. Now consider sentences with *begin*.

(106) a. John began drinking coffee before bed
etc.

The complements of these express material that is asserted, not presupposed. The presupposition in (106a) is that John had not been drinking coffee before bed prior to the time when he began to do so. But this presupposition is not related to event structure in any way that we can readily explicate in terms of the mechanisms of this chapter, and so will not be captured. In the next chapter, we will see that there are reasons in adverbial *wh* extraction facts to assume that the presupposition in (106) is not induced by δ-binding in the way argued here for the complements of *stop*.

Verbs such as *continue* might be said to involve a presupposition that the event referred to was going on, of which it is being asserted that it continues.

(107) The security services continued torturing labor leaders

But it is more accurate to analyze these not as involving a presupposition that the event in question was going on prior to the time at which it is being asserted to continue, but as involving identification of the event with its continuance: for an event to continue just means for the same event to

continue. Assume then that the complement clause of *continue* raises at LF and adjoins to the matrix IP, where its event position is θ-identified with the event position of the matrix VP. Support for this analysis of complements of *continue* over a presuppositional analysis will be given in chapter 3.

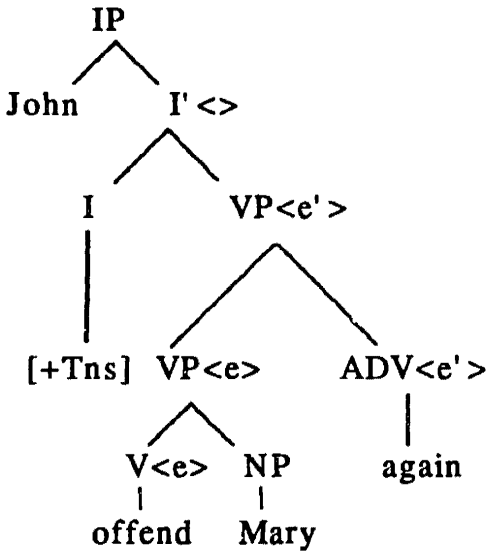
2.4.3 Iteratives and continuants

Adverbs such as *still* and *again* induce presuppositions concerning the content of the clause which they modify.

(108) a. John offended Mary again
b. The flying saucer is still sitting in the garden

The sentence in (108a) presupposes that John has periodically offended Mary in the past; (108b) presupposes that the flying saucer has been sitting in the backyard for some period of time up until the time of utterance. Since the content of the clause in (108) is not being asserted (merely that it happened again, or is still happening), I'll assume that the [+Tns] morpheme in these sentences should not discharge the event position. Instead, the adverb δ-binds the event position of the verb, and the adverb introduces an event position of its own which is θ-bound by [+Tns] in INFL.

(109)



The logical forms are along the lines given in (110).

(110) a. ∃e' again(δe[offend(John,Mary,e)],e')
b. ∃e' still(δe[sit(the flying saucer,e) & in(the garden,e)],e')

2.4.4 Clefts and pseudoclefts

Consider the cleft in (111a) and the pseudocleft in (111b).

(111) a. It was Henry that kissed Ann
b. What John lost was his wallet

These have the structures indicated in (112).

(112) a. Henry is x in δe[kiss(x,Ann,e)]
b. The x in δe[lose(John,x,e)] was his wallet

Note that the complementizer *that* is obligatory in the cleft (111a). Furthermore, note that no δ-binder of the event position is available outside the *that* clause. Assume *that* δ-binds the event position of the clause. In the pseudocleft in (111b), the δ-binder is whatever it is in headless relatives.

2.4.5 Implicit clefts with stressed constituents

The contrastive stress in (113a) induces a presupposition that John bought something, as in (113b).

(113) a. John bought THE STEREO
b. The stereo was x in δe[buy(John,x,e)]

Assume that the stressed constituent raises at LF and adjoins to IP where it δ-binds the event position of the clause.

(114) $[_{IP}$ [the stereo]$_i$ $[_{IP<e>}$ John bought t_i]]

2.5 Presuppositions, Defeasibility, and Modal Contexts

2.5.1 Defeasibility

Presuppositions are defeasible: under certain circumstances, a presupposition that would normally be generated by a sentence fails to materialize. Such presupposition failure can be explicated in terms of the

notion of a discourse frame, adopted here from Kamp (1981) and Heim (1982). Some standard examples follow.

(115) a. I don't know that Bill left
b. Sue died before finishing her thesis[24]
c. You say that someone in this room will betray you. Well, maybe so. But consider: it won't be John who will betray you, it won't be Paul who will betray you, and it won't be Bill who will betray you. Therefore, you are mistaken.

In (115a), the complement of *know* should presuppose that Bill left, but the matrix sentence states that exactly this is uncertain, and therefore it cannot be presupposed. In (115b), the complement of *before* is supposed to presuppose that Sue finished her thesis, but the matrix implies that this could not have been the case. Finally , in (115c), the negated cleft clauses such as *it won't be John who will betray you* are supposed to presuppose that someone will betray you, yet the conclusion of the discourse is that precisely this is false.

Consider what happens in cases like these on the account developed here. Starting with (115c), the speaker begins by entertaining the belief of his addressee. This establishes a discourse frame D' which the speaker regards as purely hypothetical, and which is distinct from the discourse frame D that the speaker uses for non-hypothetical discourse. The cleft sentences then do indeed involve δ-binding of the relevant event positions, but they are bound within the discourse frame D'. Thus, presuppositions are generated, but only within D'. At the end of the discourse, we compute presuppositions of the entire discourse as presuppositions within the "base

[24]Actually, note that *before* has a prevalent interpretation in which the complement is presupposed not to have occurred. (Pointed out by Howard Lasnik, p.c.)

discourse frame" D, and of course, none of the presuppositions of the cleft sentences emerge there.

On the view developed here, presuppositions (at least a large class of them) are just δ-binding within the discourse frame. As such, they are computed compositionally in a bottom-up fashion, as part of the process of semantic composition.

The idea is the same in the other examples. In (115b), the *before* clause involves δ-binding in a discourse frame, which would normally be the base frame of the discourse, yielding the presupposition that Sue finished her thesis within this frame. However, the information that Sue died before finishing her thesis makes it impossible for the discourse frame in which it is presupposed that she finished her thesis to be the base frame. Therefore, the discourse frame of the *before* clause has to be shifted to a hypothetical frame distinct from the base frame. Similarly, in (115a), the presupposition that Bill left is generated, but when presupposition composition reaches the matrix clause, it becomes clear that this presupposition is incompatible with what is being entered into the base frame by virtue of what is asserted by the clause, and then the frame of the complement has to be interpreted as a hypothetical frame.

The discourse frame of a presupposition can be shifted not only by triggers within the linguistic context, as in the examples in (115), but also by one's background knowledge. If the participants in a discourse know that John did not get his PhD, and one of them says, *At least John won't regret that he did a PhD,* everyone understands the complement clause of

regret as nonfactive. On the present account, the event position of the complement clause is δ-bound, but the background knowledge establishes that the discourse frame in which this event position is δ-bound is distinct from the base frame, and hypothetical. As a result, the sentence means something like, "At least John will not be in a situation of having done a PhD wherein he will regret having done a PhD."

2.5.2 Modals and presuppositions

Modal operators can have the effect of forcing a re-identification of the discourse frame associated with an embedded clause. This can effect determinations of definiteness. Consider the following gerund subjects.

(116) a. [John's killing of a raccoon] would have disgusted us
b. [John's killing a raccoon] would have disgusted us
c. [John killing a raccoon] would have disgusted us
d. [PRO killing a raccoon] would have disgusted us

Sentences like those in (116) without the modal were considered in section 2.4 above and were found to admit interpretations on which the gerunds are definite. But with the modal, these gerunds cannot be definite in the sense of referring to an event within the base discourse frame. Consider what happens. As the semantics of the gerund is computed, the event position of the gerund can be δ-bound, and the gerund interpreted as definite; however, once the modal *would* in the matrix is encountered, the discourse frame of the gerund is established to be hypothetical, and other than the base frame. At this point, the event position of the gerund remains δ-bound, so the gerund remains definite, but it is definite **in some discourse frame other than the base frame**. Thus the gerund is

indefinite in the sense that the event referred to is established to be in some discourse frame or other, however definitely it is established within that discourse frame. This phenomenon is not limited to gerunds, but can be observed throughout the event-definites that have been considered in this chapter. A sample follows.

(117) a. (If it were raining,) John would have mentioned that we needed an umbrella
b. (If Mary had been able to leave,) John would have seen Mary leave
c. (If he were a thief,) John would have stopped stealing coffee by now
d. (If he were the thief), John would steal again tonight

Thus, modals don't cancel presuppositions, they merely shift them to a hypothetical discourse frame, just as other instances of presuppositions being cancelled are really instances of the presupposition being preserved, but in a non-base discourse frame.

Chapter 3

Adjunct Extraction

3.0 Introduction

This chapter develops a theory of adverbial *wh* extraction using the structures developed in Chapter 2.

In this chapter, a notion of antecedent government will be needed along the lines of that given in Lasnik and Saito (1984; 1991, chapter 2). In particular, antecedent government will have to apply between α and t', and between t' and t, in the configuration in (1), and be blocked between α and t in the configurations in (2), where β in each case is a head that directly selects its complement CP or NP.

(1) $[_{CP}\ \alpha\ [_{IP}\ \ldots\ \beta\ [_{CP}\ t'\ [_{IP}\ \ldots\ t\ \ldots\ ]]]]$

(2) a. $[_{CP}\ \alpha\ [_{IP}\ \ldots\ \beta\ [_{CP}\ \gamma\ \ [_{IP}\ \ldots\ t\ \ldots\ ]]]]$
b. $[_{CP}\ \alpha\ [_{IP}\ \ \ldots\ \beta\ [_{NP}\ \ldots\ N\ [_{CP}\ t\ ..\ [_{IP}\ \ \ldots\ ]]]]$

The configuration in (1) arises in (3), and those in (2) arise in (4).

(3) Why does John believe $[_{CP}$ t' $[_{IP}$ Mary left early t]]

(4) a. * Why does John wonder $[_{CP}$ whether $[_{IP}$ Bill was fired t]]
b. * Why does John believe $[_{NP}$ the claim $[_{CP}$ t' that $[_{IP}$ Bill was fired t]]]

L&S define antecedent government as follows:

(5) α antecedent governs β iff
   a. α binds β (α c-commands β, and α and β are coindexed), and
   b. There is no γ (γ = NP or S') such that α c-commands γ and γ dominates β, unless β is in the spec of γ.

In Chapter 4, antecedent government, with essentially the characteristics of the formulation in (5), will be defined in terms of the government domains of governing heads.

At various points in the following, it will be said that adverbial *wh* phrases are construed through their traces; specifically, this means that the event position of the adverbial can be θ-identified with an event position accessible in the position of its trace, thus effecting construal of the *wh* adverbial through its trace. These might alternatively be analyzed as instances of reconstruction of the adverbial *wh* phrase.

3.1 Adverbial Extraction from Tensed Complements

The goal of this section is to give an account of adverbial *wh* extraction from tensed clausal complements in terms of the event structure of the complement clause coupled with the characteristic mode of interpretation of adverbial elements. At a further remove, this supports the thesis that the event θ-position (Higginbotham 1985, following Davidson 1980) should be grammaticalized in the syntax in such a way that it interacts intricately with other aspects of syntactic structure.

3.1.1. The basic extraction facts

It is well documented that adverbial *wh* elements in English cannot be extracted by *wh* movement out of the complements of factive verbs, while they extract freely out of complements of nonfactive verbs (Kiparsky and Kiparsky 1971; Cattell 1978; Melvold 1986; Cinque 1990). Thus the adverbial *wh* elements in (6) can be interpreted as associated with the embedded clause, but not those in (7).

(6) a. Why do you believe [that John left ___]
b. How do you suppose [that John fixed the car ___]

(7) a. * Why do you regret [that John left ___]
b. * How did you point out [that John stole the file ___]

Objects, in contrast, differ little in their extraction possibilities from factive and nonfactive complements.

(8) a. Who do you regret [that John met ___]
b. What do you recall [that John found ___]

(9) a. Who do you think [that John met ___]
b. What do you suppose [that John took ___]

Assessment of the possibilities of subject extraction from these complement types is a more delicate task. Speakers separate into two categories concerning subject extraction from factive complements, namely, those who find such extraction generally quite good, and those who find it consistently bad. A selection of subject extractions from complements of factive and nonfactive verbs are given in (10) and (11) respectively.

(10) (?*) for some speakers
a. Who did he admit [___ participated in the break in]
b. What did he admit [___ made him change his mind]
c. Who did you forget [___escaped]

d. Who did John mention [___ hired Bill]
e. What did John mention [___ would convince him to go]
f. Who did John notice [___ left early every day]
g. Who did you point out [___ met Bill at the station]
h. Who did you realize [___ looks like Bill]
i. Who does John recall [___ met Bill at the station]
j. Who do you regret [___ could not make it]
k. Who do you regret [___ stole the file]

(11)

a. Who do you assume [___met Bill]
b. Who do you believe [___met Bill]
c. Who do you claim [___stole the file]
d. Who do you claim [___would make a good candidate]
e. Who do you figure [___stole the file]
f. Who do you maintain [___met Bill]
g. What did you suggest [___caused the accident]
h. Who do you think [___stole the file]
i. Who do you suspect [___stole the file]
j. Who do you think [___would make a good candidate]
k. ??Who did John state [___ stole the file]
l. ??Who did you assert [___ stole the file]
m. ??Who do you conjecture [___ stole the file]

The subject extractions from propositional complements are good, except for those that require a complementizer, as in (11k,l,m). In Chapter 2 it was suggested that complementizers are obligatory on the surface only when they play a role at LF. If this is right, then the complementizers of factive complements, being obligatory, are present at LF, and the same is true of the complementizer of propositional complements when they are obligatory. Since semantically contentful items cannot be inserted in the course of a derivation,[1] it follows that such complementizers must be present at D-structure and S-structure, as well as at LF. Therefore, the questions in (10) and (11k,l,m), in which these complementizers are missing, are expected to be bad. This will be taken up later in this chapter.

[1]See Lasnik & Saito (1984), where it is argued that Affect α cannot delete or insert semantically contentful material.

3.1.2. Syntactic accounts in the literature

Kiparsky and Kiparsky (1971) argue that the factive complement is a complex NP of the form [NP the fact [S that ...]], and is therefore an island to movement. But then, by standard theories of constraints on movement (Lasnik and Saito 1984, 1990; Chomsky 1986b; Rizzi 1990), the object extractions in (8) should be degraded on the order of a subjacency violation (as noticed by Cattell 1978), contrary to fact.

Cinque (1990, p.30) argues that factive CP complements are θ-marked but not L-marked (in the sense of Chomsky 1986b, p.15); therefore, factive complements are not directly selected by the factive verb, so they are barriers to government. However, the grounds for Cinque's conclusion that factive complements are not L-marked are quite questionable. He assimilates factive complements to complements of manner of speaking verbs, such as *yell*, in the following contrast (noted in Kayne 1983c, fn.23).

(12) a. * Who$_i$ did you say t_k to t_i [that Bill was here]$_k$
b. Who$_i$ did you yell to t_i [that Bill was here]

Assuming that (12a) exhibits crossing of A'-dependencies, this suggests that the complement of the manner of speaking verbs in (12b) is generated higher than the prepositional dative, and is therefore not directly selected as the most internal argument of the verb. But factive complements do not pattern with (12b), and when they are separated from the verb by a prepositional dative, they take an expletive associate occurring as the internal argument of the verb:

(13) a. ?*Who$_i$ did you mention to t_i [that Bill was here]
b. Who$_i$ did you mention it$_k$ to t_i [that Bill was here]$_k$

This suggests that factive complements are directly selected by the verb. This conclusion is reinforced by the fact that factive complements cannot be left behind by *do so* substitution, which is generally capable of leaving behind anything not directly selected by the verb.

(14) a. * John mentioned to Mary [that Bill was crazy], and Tom did so [that Bill was dangerous]
b. John mentioned [that Bill was crazy] to Mary, and Tom did so to Julie

The data in (14) hold as well for complements of manner of speaking verbs, suggesting that these too are internal arguments of the verb. Their behavior in (12) therefore rests on other grounds. Maybe (12b) is a result of restructuring [V *yell to*], where such restructuring is not available to propositional V+*to* or factive V+*to* in (12a) and (13a).

For a different approach, suppose that a factive operator O is either moved to spec-CP of a factive complement at LF, or generated there at LF (Melvold 1986).[2] Assuming the extraction theory of Lasnik & Saito (1984), it follows that the presence of O blocks adjunct extraction while leaving argument extraction unaffected. In particular, the extraction proceeds through spec-CP of the complement clause, leaving an intermediate trace there at S-structure, as in (15).

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[2]The operator O is a sentential or propositional operator which takes the factive IP as its argument. It is not a variable-binding operator. The factive operator cannot be in spec-CP of the complement clause at S-structure since, if it were, then the object extractions in (8) would exhibit a subjacency violation.

(15) a. What$_i$ does John regret [$_{CP}$ t_i' that [$_{IP}$ Bill stole t_i]]
b. Who$_i$ does John regret [$_{CP}$ t_i' [$_{IP}$ t_i could not make it to the meeting]]
c. * Why$_i$ does John regret [$_{CP}$ t_i' that [$_{IP}$ Bill issued the order t_i]]

On Melvold's account, in (15a), the initial trace t_i of the object is γ-marked as [+γ] at S-structure by the lower verb, *stole*, so the intermediate trace t_i' can delete at LF, allowing the factive operator O to be generated there. In (15b), the intermediate trace t_i' γ-marks the initial trace t_i as [+γ] at S-structure, so there too the intermediate trace can delete at LF, making way for the factive operator. But since traces of adjuncts are only γ-marked at LF, the intermediate trace in (15c) must be present at LF to γ-mark the initial trace t_i as [+γ], preventing the factive operator from being introduced in spec-CP of the complement clause.

The presence of the factive operator in spec-CP of the complement clause will cause problems with sentences like those in (16).

(16) a. John knows [$_{CP}$ why$_i$ [Bill left t_i]]
b. John forgot [$_{CP}$ how$_i$ [Bill fixed the car t_i]]

The account can be amended to get around this problem (David Pesetsky, p.c.) if we suppose that the factive operator O is adjoined at LF to a factive CP complement and if we assume that a factive operator adjoined to CP blocks antecedent government into spec-CP.[3] Then argument extraction proceeds as before, relying on γ-marking at S-structure. But adjunct extraction, as in (15c) above, is blocked since the operator O adjoined to CP blocks antecedent government of the intermediate trace, so the

[3]This won't follow automatically on Rizzi's (1990) Relativized Minimality condition since that condition refers to A' spec positions, not adjoined positions.

intermediate trace is marked [-γ], and the structure is therefore ungrammatical. In (16), the operator adjoined to CP does not intervene between the *wh* elements in the intermediate COMPs and their traces, so these extractions are unaffected by the factive operator. Thus amended, this account captures the extraction data in (15)-(16). It involves adjunction to an argument CP, which is problematic in some frameworks (such as that of Chomsky 1986b), and involves a generalization of the Rizzi's Relativized Minimality condition. A more principled account of these facts will be sought here across a much wider range of cases deriving from the mechanisms of presupposition generation developed in Chapter 2.

3.1.3 Adverbial extraction and event structure

The extraction data in (6)-(11) will be addressed in this section. As the foundation for this discussion, three background assumptions will first be introduced.

Assumption 1. Adverbial *wh* elements have an event θ-position, and construal of the adverbial *wh* element is by θ-identification of this event position with that of the modified clause.

This assumption is part of the larger framework of assumptions adopted here from Higginbotham (1985, 1989). For reason adverbials, the relevant notions were elaborated in Chapter 1 above. As mentioned there, θ-identification by itself is too simple to capture all the properties of adverbial modification. However, it captures a locality restriction that

seems to hold on adverbial modification generally, and it is this locality restriction that will be critical to the following discussion.

Assumption 2. There is no antecedent government across a complementizer. There can be antecedent government across C^0 when it contains no complementizer.[4]

This captures the effects of the Minimality condition of Chomsky (1986b) as it applied to the C system. Assumption 2 will follow from the formulation of antecedent government to be undertaken in the next chapter.

Assumption 3. An overt complementizer that is optional can delete at LF. An overt complementizer that is obligatory cannot delete at LF.

We assume that complementizers are obligatory when they play a role at LF. In factives and response stance complements, an LF role for the complementizer was delineated in Chapter 1, namely, to discharge the event position of the complement clause. In most propositional complements, the complementizer is optional, and is therefore not present at LF. For propositional complements in which the complementizer is obligatory, assumption 3 requires that the complementizer be present at LF. Support for assumption 3 will be given below in section 3.1.4. In the meantime, since the account to be developed here depends critically on the presence or absence of a complementizer, we need to complete the extraction data by

[4]For now, we are only concerned with the presence or absence of the overt complementizer *that*. The lack of antecedent government over null complementizers will be considered later.

considering adjunct extraction out of propositional complements when the complementizer is obligatory. For the data considered so far, the pattern is the same as for other propositional complements, given in (6), (8), and (11) above. In particular, adjunct extraction is available as follows.

(17) a. Why did John assert [that Bill should be fired ___]
b. Why did John state [that Bill is unhappy ___]
c. Why did John conjecture [that Bill left the meeting early ___]
d. Why did John propose [that Bill go before the committee ___]

As final preparation for the account, we extend the data to response stance complements. Cattell (1978) noted that the extraction pattern out of factive complements holds as well for the response stance verbs.

(18) a. What do they agree / deny / doubt [that John stole ___]
b. Who do they agree / deny / doubt [___would make a good candidate]
c. * Why do they agree / deny / doubt [that John left ___]
d. * How do they agree / deny / doubt [that John caused the accident ___]

Thus the class of verbs exhibiting the "factive" paradigm is exactly the class of verbs whose complement involves δ-binding of its event position, on the account of chapter 2. Recall from section 2.1 that CP complements of p(ropositional)-verbs have an open event position whereas the event position in complements of f(active)-verbs and r-verbs is discourse bound by the complementizer *that*.

(19) a. forget [CP<> that [IP<e> Max [I'<e> I [VP<e> visit Spain]]]]
|_____↑

b. believe [CP<e> that [IP<e> Max [I'<e> I [VP<e> visit Spain]]]]
|_____↑

We now develop an account of the data. Consider the possibility of adverbial *wh* extraction from the three contexts given in (20), where the complementizer *that* is optional in (20a) and obligatory in (20b,c).

(20) a. Why do they believe [(that) Mary hired Bill ___]
b. Why did they state [that Mary hired Bill ___]
c. Why did they forget [that Mary hired Bill ___]

The LF structure of these relevant for purposes at hand is the following, where the adverbial *wh* element has a chain with an intermediate trace t' in the embedded spec-CP, and an initial trace within the embedded IP.

(21) a. [CP why do [IP they believe [CP t' [IP Mary [VP<e> [hired Bill] t]]]]]

b. [CP why did [IP they state [CP<e> t' that [IP<e> Mary [VP<e> [hired Bill] t]]]]]

c. [CP why did [IP they forget [CP<> t' that [IP<e> Mary [VP<e> [hired Bill] t]]]]]

In (21a), the complementizer *that* is missing at LF, so t' antecedent governs the initial trace t of *why*. Assuming the movement chain indicated in (21a), the event position of *why* can θ-identify through the trace t with the event position of the lower verb, contained in the θ-grid of the verb projected up to VP. The resulting event position then propagates to the lower CP node where it is discharged in semantic composition with the propositional verb *believe*. This part of the event structure in (21a) is not critical to the construal of the *wh* adverbial, and so was not indicated. The *wh* adverbial *why* is thereby construed with the lower clause in (20a). In (21b), the complementizer *that* is obligatory and therefore, by assumption 3, remains in place at LF. By assumption 2, the intermediate trace t' does not antecedent govern the initial trace t. Therefore, the construal chain is

broken at t' for purposes of adverbial *wh* construal. Nevertheless, *why* can be construed with the lower clause through the intermediate trace t' since the event position of the lower clause is available at C' for θ-identification with the event position of *why* under sisterhood with the trace t'. This yields construal of *why* with the lower clause in (20b). In (21c), the complementizer *that* is also obligatory and so, by assumption 3, present at LF. So t' does not antecedent govern t in (21c). However, there is no way to recover construal with the lower clause in (21c) as there was in (21b). The complement of *forget* is a closed CP whose event position is discharged at IP by the complemetizer *that*; the event position of the complement clause is therefore not available at the C' node for θ-identification with the event position of *why* under sisterhood of C' with t'. Thus (20c) lacks the interpretation involving construal of *why* with the complement clause. In (21c), the only trace of *why* that can be construed with the complement clause is the initial trace t, but since the chain is broken by the failure of antecedent government over the complementizer, this does not yield the construal indicated in (20c).

Object extraction out of the contexts in (20a,b,c) goes through unaffected by the event θ-structure of the complement clause. In particular, object *wh* NPs extract as freely from the complement clause in (21c) as from the complement clauses in (21a,b). This is in accord with the object extraction data in (8) and (9).

Subject extraction out of factive complements, and complements of response stance verbs, poses a problem at this point. The complementizer of the complement clause must be missing upon subject extraction, since

otherwise a *that*-trace configuration is generated. Yet in factives and response stance complements, as well as the complements of a few propositional verbs, the complementizer is obligatory. This leads us to expect that subject extraction from these complements should be fully ungrammatical. For some speakers, this seems to be the case. But other speakers find these subject extractions to be on the whole grammatical, with some variation depending on the matrix verb. The account given here, articulated to this point, accounts for the judgments of the former speakers, and provides no explanation for the judgments of speakers in this latter group.

3.1.4 Adverbial extraction out of multiple embeddings

It is possible to extract adverbial *wh* elements out of deeply embedded propositional clauses, provided any intervening complementizers are nonobligatory. As illustrated in (22), this holds when the intervening complementizers are present overtly, as well as when they are absent.

(22) a. Why does John think [(that) Mary said [(that) Bill was fired ___]]
b. Why did John suggest [(that) Mary claimed [(that) Bill assumes [(that) Linda was fired ___]]]

Since the nonobligatory complementizers can delete at LF, these structures allow for unbroken chains, with successive members related by antecedent government, from the adverbial *wh* element in its surface position down to an initial trace in a position for construal with the most deeply embedded clause. The LF structure of (22a), in particular, is that shown in (23).

(23)

[CP Why does [IP John think [CP t" [IP Mary said [CP t' [IP Bill was fired t]]]]]]

With factive or response stance complements, there is no possibility of deriving such a licit structure since the presence of the obligatory complementizer blocks antecedent government into a complement clause even at a single level of embedding.

Particularly revealing cases are provided by adverbial *wh* extraction out of multiply embedded propositional complements when some of the intervening complementizers are obligatory. To begin with, adverbial *wh* extraction is blocked when all the complementizers are obligatory, as in (24a), which has the structure in (24b).

(24) a. Why did John conjecture [that Mary asserted [that Bill was fired ___]
b. [CP why did [IP John conjecture [CP t" that [IP Mary asserted [CP t' that [Bill was fired t]]]]]]

In this example, antecedent government fails between t" and t', and between t' and t. A further test case for the assumptions adopted here can be constructed by replacing either the higher or the lower verb in (24), but not both, with a propositional verb taking a complement with optional complementizer. This yields the two sets of examples in (25) and (26), where *that* is optional only in the higher complement in (25), and only in the lower complement in (26).

(25) a. Why did John say [(that) Mary conjectured [that Bill is unhappy ___]]
b. Why does John believe [(that) Mary stated [that Bill was fired ___]]
c. Why does John think [(that) Mary proposed [that Bill should go before the committee ___]]

(26) a. * Why does John conjecture [that Mary said [(that) Bill is unhappy ___]]
b. * Why did John state [that Mary believes [(that) Bill was fired ___]]
c. * Why does John propose [that Mary should claim [(that) Bill was fired ___]]

The extractions in (25) are obtainable, but not those in (26). These results are what we expect on the assumptions adopted here. The relevant LF structure in (25) is shown in (27).

(27) Why did John say [$_{CP}$ t" [$_{IP}$ Mary conjectured [$_{CP<e>}$ t' that [$_{IP<e>}$ Bill is unhappy t]]]]

In this structure, t" antecedent governs t', and t' can be construed with the lower clause by virtue of the event position of the lower clause which remains undischarged on the CP node of that clause, where it is accessible for θ-identification at C' with the event position of the adverbial through the trace t'. In this way, the fact that t' does not antecedent govern t does not impinge on the construal of *why* with the lowest clause in (25).

The relevant LF structure in (26) is that shown in (28).

(28) Why did John state [$_{CP}$ t" that [$_{IP}$ Mary believes [$_{CP<e>}$ t' [$_{IP<e>}$ Bill was fired t]]]]

In this structure, t" does not antecedent govern t'. Thus, although both t' and t can be construed with the lowest clause, this does not allow construal of *why* with the lowest clause since t' and t are not part of a licit chain headed by *why*. Of course, t" can be construed with the higher complement by virtue of the event position of this clause projected up to the CP node immediately dominating t". And the sentence in (26b) has the corresponding interpretation in which *why* is construed with the higher

embedded clause. But construal of *why* with the lowest clause is not available, as necessitated by the structure in (28).

A further, particularly clear, test case is provided when the lowest clause is infinitival, since the boundary of the infinitival is, in itself, readily permeable to adverbial *wh* extraction (as will be discussed in section 3.2 below). Thus, the extraction of *why* in (29) below is especially felicitous, where both verbs are propositional taking complements with optional complementizer. Contrast with (30).

(29) Why did John say [(that) Mary believes [Bill to be unhappy ___]]

(30) * Why did John state [that Mary believes [Bill to be unhappy ___]]

Despite the permeability of the infinitival boundary in (30), *why* cannot be construed with the infinitival complement in this question since the obligatory complementizer in the complement of *state* is present at LF and thus prevents there being a chain from *why* to its trace (if any) within the infinitival.

In some languages, including much of Romance, complementizers are obligatory in all fully tensed (nonsubjunctive) complement clauses, including all propositional complements. The account developed here predicts that, in such languages, adverbial *wh* construal should be impossible out of tensed complements beyond one level of embedding. This prediction is apparently borne out in French, Spanish, and Catalan, which have obligatory complementizers. Examples from French and Catalan follow. In (31), object extractions from one and two levels of

embedding are exhibited in Catalan; adverbial *wh* construal into one level of embedding and two levels of embedding in Catalan is exhibited in (32) and (33).

(31) a. Què creus que va comprar en Guillem
what you-think that aux-3s buy the G.
'What do you think that G. bought?'

b. Què creus que va dir la Maria que va comprar en Guillem
what you-think that aux-3s say the M. that aux-3s buy the G.
'What do you think that M. said that G. bought?'

(32) a. Per què creus que en Guillem va marxar
why you-think that the G. aux-3s leave
'Why do you think that G. left?'

b. Com creus que en Guillem va arreglar el cotxe
how you-think that the G. aux-3s fix the car
'How do you think that G. fixed the car?'

(33) a. ?* Per què creus que la Maria va dir que en Guillem va marxar
why you-think that the M. aux-3s say that the G. aux-3s leave
'Why do you think that M. said that G. left?'

b. ?*/?? Com creus que la Maria va dir que en Guillem va arreglar el cotxe
how you-think that the M. aux-3s say that the G. aux-3s fix the car
'How do you think that M. said that G. fixed the car?'

Spanish data are similar to the Catalan. In French, the three corresponding sets of judgments are as follows.

(34) a. Que penses-tu que Bill a achete
what think-you that B. bought

b. ? Que penses-tu que Marie a dit que Bill a achete
what think-you that M. aux said that B. bought

(35) a. Pourquoi penses-tu que Bill est parti
why think-you that B. left

b. Comment penses-tu que Bill a réparé la voiture
how think-you that B. fixed the car

(36) a. * Pourquoi penses-tu que Marie a dit que Bill est parti
why think-you that M. aux said that B. left

b. * Comment penses-tu que Marie a dit que Bill a réparé la voiture
how think-you that M. aux said that B. fixed the car

In Italian, the adverbial *wh* can be construed with a clause at two levels of embedding, but only when this clause has *pro* subject.

3.1.4.1 On a processing account of the data

There is a difficulty in evaluating data of the sort dealt with in this chapter. In order to construe an adverbial *wh* in the matrix COMP with an embedded clause, it is necessary to filter out or put aside the interpretation with the adverbial *wh* construed with the matrix clause. And the latter interpretation is often somewhat more salient or easier to get than construal with an embedded clause. This suggests the possibility that failures of construal with an embedded clause might be a processing effect, essentially a garden path effect, in which the adverbial *wh* is interpreted at the first opportunity in the course of processing the sentence from beginning to end, yielding construal with the matrix clause.[5] This possibility can be addressed in the following contexts, considered above.

(37) a. * Why did John notice [that Bill moved the furniture ___]
b. * Why do they agree [that Bill quit school ___]

(38) a. * Why did John state [that Bill quit school ___]
b. * Why do you conjecture [that Bill quit school ___]

(39) * Why did John state / assert [that Mary said [that Bill quit ___]

However, note that even if the lack of lower construal in (37)-(39) is due to a garden path effect in processing, this effect must fail to obtain in the

[5]This was pointed out to me by Noam Chomsky and David Pesetsky, independently.

processing of questions involving adverbial *wh* extraction out of propositional complements such as those in the following.

(40) Why did John say [(that) Mary believes [(that) Bill quit school ___]]

The generalization seems to be the one adopted here: that adverbial *wh* extraction is readily available over nonobligatory complementizers, and not readily available over obligatory complementizers.[6] This, by itself, does not rule out the possibility that the contrasts are due to garden path or other processing effects: it is conceivable that processing effects are at work, and that they are triggered by an obligatory complementizer, or by some aspect of the interpretation, hitherto unnoticed, which is correlated with obligatoriness of the complementizer. However, pending the establishment of such a connection in processing studies, this involves an appeal to an unknown connection between processing and the obligatoriness of the complementizer. The syntactic explanation offered above in this chapter, on the other hand, provides an explicit explanation of the observed contrasts and of the underlying generalization. Under these circumstances, the explanation offered here should stand, although it should be recognized that this explanation would be undermined if garden path effects or the sort described above were shown to occur in the data under consideration.

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[6]A good minimal pair is provided by the following.

(i) a. Why did John say that Mary thinks [Bill left ___]
b. * Why did John state / assert that Mary thinks [Bill left ___]

3.2 Adverbial Extraction and Event Structure: Other Contexts

We turn now to adverbial *wh* extraction from other contexts whose event structure was discussed in Chapter 2.

3.2.1 Nonfactive infinitivals

We begin with extraction from nonfactive infinitivals.

(41) *believe* class
  a. Why did Mary believe [Bill to have left ___]
  b. How did Mary suspect [Bill to have stolen the car ___]

(42) *want* class
  a. Why does John want [Mary to be hired ___]
  b. Why does Mary want [Bill to shred the documents ___]
  c. Why does Mary want [PRO to be liked ___]
  d. How does Mary want [Bill to get on the roof ___]

(43) *try* class
  a. Why did Mary try [PRO to be liked ___]
  b. How did Mary try [PRO to get into the Peace Corps ___]
  c. Where did Mary try [PRO to be assigned___]

The complements in (41) are bare IPs, selected by the higher verb; the adverbial *wh* element therefore antecedent governs its trace within the infinitival complement. In (42a,b,c), construal of a rationale adverbial with the verb *want* of the higher clause must be carefully distinguished from construal with the lower clause. The existence of a lower construal is most easily detected with a *for* phrase, as given in (44a,b), construed as rationales associated with the lower clauses of (42a,b), respectively.[7]

(44) a. For her journalism experience.
  b. For kindling.

[7]This was pointed out to me by James Higginbotham and Howard Lasnik, independently.

And (42d) readily admits construal of *how* with the lower clause. Following Pesetsky (Class lectures, Fall 1988), the complements in (42) are CPs introduced by a null prepositional complementizer, *for*, expressing an attitude towards an irrealis event. *For* is thereby regarded as taking an irrealis event argument, so *for* discharges the event position of the complement clause. The relevant structure is given in (45).

(45) [CP why does [IP Mary want [CP<> t' for [IP<e> Bill to be elected t]]]]

Given its argument structure, and its capacity to assign case to a lexical subject, *for* has more than just the categorial and unmarked features of a complementizer. It follows that the *wh* adverbial in (45) can extract out of the infinitival IP, and be construed with the event position of this clause. Thus, construal of the *wh* adverbial with the lower clause is expected to be available in (42).

Lower construal of the *wh* adverbial is also available in (43), as indicated by the suitability of the answers in (46) as associated with the complement clause.

(46) a. For her diligence.
b. As an alternate.

The verb *try* also takes a CP complement with a *for* complementizer, so the structure of (43) is that in (45), and the availability of adverbial *wh* construal with the lower clause follows.

3.2.2 Perception verbs and implicative verbs

Next, consider adverbial *wh* extraction from complements of perception verbs and implicatives.

(47) a. Why/for what reason did John see [Mary leave ___]
b. How did John see [Mary fix the car ___]

(48) a. Why did John make [Bill jump into the lake ___]
b. How did John make [Bill fix the car ___]

(49) a. Why did John cause [Bill to jump into the lake ___]
b. How did John cause [Bill to discover a dinosaur bone ___]

(50) a. Why did John manage [PRO to get into the barn ___]
b. For what reason did John manage [PRO to get into the barn ___]
c. How did John manage [PRO to fold the map ___]

In (47)-(50), the *wh* adverbial can be construed with the infinitive or naked infinitive complement in a way distinguishable from construal with the matrix clause. In (47), the distinction between the interpretations associated with the two positions of construal is not subtle. In (48)-(50), the lower construal is implicated in possible answers such as those in (51) for (48) and those in (52) for (49).

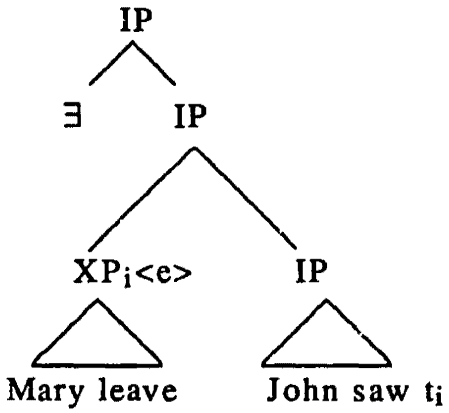
(51) a. To cool off. (John forced Bill to work in the hot sun.)
b. In his best clothes. (John wouldn't let Bill change into overalls.)

(52) a. To extinguish the fire. (John lit Bill's clothes on fire.)
b. By instructing Bill to dig up the backyard.

Using Higginbotham's (1983) analysis of perception sentences, and mechanisms from Heim (1982), these were all analyzed in Chapter 2 as involving LF adjunction of the complement clause, with its event position

open, to the matrix IP, where an unselective binder ∃ is projected to bind the open event position of the raised complement.

(53)



The extraction structures in (47) and (48)-(50) at LF are then of the form given in (54).

(54) a. [$_{CP}$ why$_k$ did [$_{IP}$ ∃ [$_{IP}$ [$_{XP<e>}$ Mary leave]$_i$ [$_{IP}$ John saw t$_i$] t$_k$]]]

b. [$_{CP}$ why$_k$ did [$_{IP}$ ∃ [$_{IP}$ [$_{XP<e>}$ Bill fix the car]$_i$ [$_{IP}$ John made t$_i$] t$_k$]]]

In this configuration, the *wh* adverbial can be extracted from the position of t_k and and thereby construed (through its trace t_k) with the complement clause through θ-identification of its event position with the open event position in XP$_i$<e>. Thus construal of the *wh* adverbial with the complement clause is available in (47)-(49).[8] The sentences in (50) are good, but it is to be noted that construal of the adverbial *wh* with the

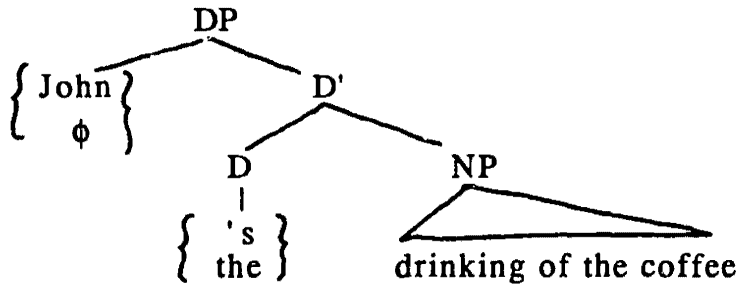
[8]An alternative approach to factivity is developed in Uribe-Etxebarria (1990). She assumes that factive *that* -clauses raise at LF and adjoin to the matrix IP; this is the structural condition for interpretation as factive on her account. Uribe-Etxabarria then argues that antecedent government would fail across the raised CP, blocking adjunct extraction out of the factive complement. If this is correct, and if complements of perception verbs and *cause* and *make* also raise and adjoin to IP, yielding their factive interpretations, then on the account of Uribe-Etxabarria, adjunct extraction should be blocked from these complements as well, contrary to fact.

infinitival complement of *manage* is indistinguishable from construal with the matrix clause. In Chapter 2, it was argued that the infinitival complement of *manage* raises at LF with its open event position and adjoins to the matrix VP, where its event position is θ-identified with the event position of the matrix verb; thus managing to do X and doing X are the same event. It follows on this analysis that adverbial modification of the complement of *manage* is indistinguishable from modification of the matrix clause. So the facts concerning the construal of the adverbial *wh* elements in (50) follow from the event structure presented in Chapter 2.

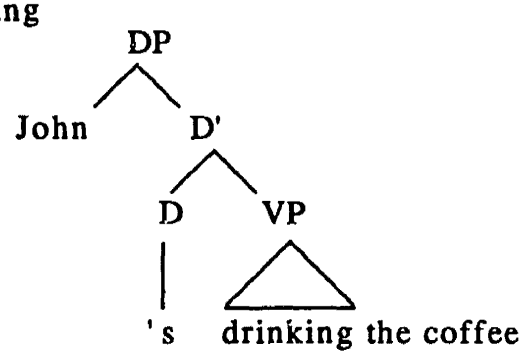
3.2.3 Gerunds

For extraction out of gerund complements, we need to consider both definite and indefinite gerunds. Recall from Chapter 2 that there are four types of gerunds, ing-of, POSS-ing, ACC-ing, and PRO-ing, to which we assigned the following structures.

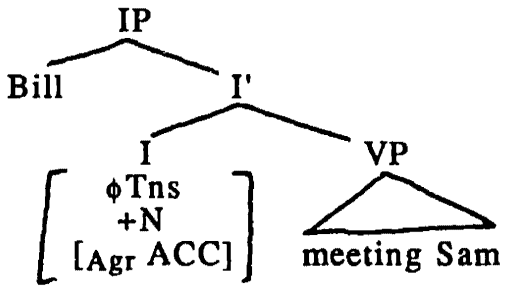
(55) ing-of



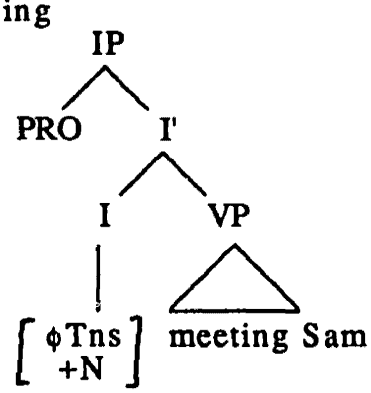
(56) POSS-ing



(57) ACC-ing



(58) PRO-ing



The ing-of and POSS-ing are definite when the contents of D^o δ-bind the event position; the ACC-ing and PRO-ing are definite when the contents of I^o δ-bind the event position. Since they are not L-marked (cf. Chomsky 1986a), the NP and VP complements of D in the ing-of and POSS-ing gerunds are barriers to antecedent government. Therefore, we expect that a *wh* adverbial cannot across these nodes and antecedent govern its trace. In

a definite ing-of or POSS-ing, where the event position is discharged by the contents of D^o, it follows that a *wh* adverbial cannot extract and antecedent govern its trace in a position where the event position of the gerund is available for θ-identification; therefore, we expect that a *wh* adverbial cannot be construed as modifying a definite ing-of or POSS-ing gerund. The possibility of *wh* adverbial construal inside a definite ACC-ing or PRO-ing gerund depends on whether the I^o[+N] head in these gerunds is an extended projection of V. (See Chapter 4 below.) If the I^o[+N] is not, then these gerunds will pattern with the ing-of and POSS-ing gerunds. This will turn out to be the case, when we examine the data below. In all four gerunds, an indefinite interpretation, or the possibility of quantificational variability, arises when the designated δ-binder exercises the option not to discharge the event position, so that the maximal projection of the gerund emerges with an open event position. The indefinite gerund raises at LF and adjoins to the matrix IP. This allows that a *wh* adverbial can extract from a position adjoined to the matrix IP and and be construed with the gerund DP<e> or IP<e>, by having its event position θ-identified with that of the gerund.

(59) a. Why does John deplore [Bill's talking to Sam]

b. $[_{CP}\ why_k$ does $[_{IP}\ \exists\ [_{IP}\ [_{DP<e>}$ Bill's talking to Sam$]_i$ $[_{IP}$ John deplore $t_i\ ]\ t_k\ ]]]$

Relevant data are given below. Where data are given for the POSS-ing, they hold equally well for the ing-of, and where data are given for the ACC-ing, they holds equally well for the PRO-ing.

(60) Indefinite POSS-ing (& ing-of)[9]

a. For what reason does John object to [Bill's quitting jobs ___]
b. How does John object to [Bill's bursting into rooms ___]

For rationale modifiers, the judgment with *for what reason* is more secure than with *why*. The two interpretations, involving construal of the adverbial *wh* with the matrix and embedded clauses, can be distinguished in light of appropriate answers under each interpretation, as in the following for (60a,b).

(61) a. Because he (John) thinks Bill does a good job. [matrix construal]
b. Because he (Bill) wants more money. [embedded construal]

The questions in (60), construed as indefinite, allow an interpretation for each of the possible answers in (61). But with the gerund in (62) construed as definite, only matrix construal of the *wh* is available.

(62) Definite POSS-ing (& ing-of)

a. * For what reason did John object to [Bill's quitting his job ___]
b. * How did John object to [Bill's bursting into the room ___]

On the interpretation of (62) on which the gerund is definite, there is understood to be a definite occasion at issue of Bill quitting his job, or bursting into a room. The pattern for ACC-ings and PRO-ings is the same, as in the following.

[9]Certain features of the sentences that follow, including the tense of the matrix and the definiteness of the object within the gerund, are chosen to facilitate an interpretation of the gerund as definite or indefinite, as indicated. However, the surface forms given, as strings of words, are not inherently definite or indefinite, but admit definite or indefinite interpretations, more or less felicitously, as the case may be. Likewise, the grammaticality judgments given for these sentences are given for the question with the gerund interpreted as definite or indefinite, as indicated.

(63) Indefinite ACC-ing (& PRO-ing)

a. For what reason does John object to [Bill quitting jobs ___]
b. How does John object to [Bill bursting into rooms ___]

(64) Definite ACC-ing (& PRO-ing)

a. * For what reason did John object to [Bill quitting his job ___]
b. * How did John object to [Bill bursting into the room ___]

Note that construal of an adverbial *wh* into a definite ACC-ing or PRO-ing is as bad as into a definite ing-of or POSS-ing. It follows that the I^0[+N] head in these gerunds must not count as a projection of V to block antecedent government into the non-L-marked VP, where the event position of the gerund is available for construal. This covers adverbial construal into definite and indefinite object gerunds. Note that objects extract freely from the definite gerunds, where construal of an adverbial *wh* is blocked, and subjects extract when their point of origin is more deeply embedded.

(65) a. [What]$_i$ did John object to [Bill('s) quitting t_i]
b. [Which room]$_i$ did John object to [Bill('s) bursting into t_i]
c. Who$_i$ did John object to [Bill('s) taking t_i to the beach]
d. Who$_i$ did John object to [Bill('s) claiming [t_i" Agr$_i$ [t_i helped Mary]]]

So these contexts exhibit the paradigm observed with respect to factive and response stance complements: arguments extract freely, while adverbial *wh* construal is completely blocked.

When the event position of the gerund is quantified out by an adverb of quantification, then, since this interpretation is similar to the indefinite in involving raising of the gerund with an open event position, we expect adverbial *wh* construal into the gerund to be available, as is the case.

(66) a. For what reason / how do you always enjoy [Bill's singing of that song ___]

b. For what reason / how do you always enjoy [Bill's singing that song ___]

c. For what reason / how do you always enjoy [Bill singing that song ___]

d. For what reason do you always enjoy [PRO singing that song ___]

As happens almost throughout these data, the judgment with *for what reason* is more secure than with *why*. This looks similar to the greater extractability of *which* phrases on the theory of Cinque (1990), according to which the *which* phrase ranges over a delimited set and is thereby referential, lending it greater extractability over weak islands. However, one should be cautioned against adopting this explanation for the greater extractability of *for what reason* over *why* in the examples above since in examples like (66), *for what reason* can be understood as ranging over a thoroughly nondelimited set of possible rationales.

As mentioned in Chapter 2, gerund complements of factive verbs are factive, with the event position of the gerund δ-bound by the contents of D^0 or I^0. As we expect, adverbial *wh* elements cannot be construed within the gerund complement of a factive verb.

(67) a. * Why/how did John mention [Bill's capturing of the raccoon ___]
b. * Why/how did John mention [Bill's capturing the raccoon ___]
c. * Why/how did John mention [Bill capturing the raccoon ___]
d. * Why/how did John mention [PRO capturing the raccoon ___]

ACC-ing and PRO-ing gerunds occurring as complements of p-verbs can be propositional; in this case, adverbial *wh* construal into the gerund is possible.

(68) a. Why/how did John imagine [Bill being led to the gallows ___]
b. Why/how did John visualize [PRO being charged with sedition ___]

Ing-of and POSS-ing gerund complements of p-verbs cannot be interpreted as propositional; they must be either definite or indefinite. First, consider definite ing-of and POSS-ing complements, as in the following.[10]

(69) a. John imagined Bill's holding off of the tiger
b. John imagined Bill's holding off the tiger

With the gerund interpreted as definite, adverbial *wh* elements cannot be construed into the gerund, as we expect. The construals indicated in (70) are out when the gerunds denote a definite (actual) event of Bill holding off a tiger.

(70) a. * How did John imagine [Bill's holding off of the tiger ___]
b. * How did John imagine [Bill's holding off the tiger ___]

An ing-of or POSS-ing gerund complement of a p-verb can be interpreted as indefinite, or it can enter into quantificational variability; in these cases, adverbial *wh* construal into the gerund is available. Thus, (71) can mean that on each occasion of Bill drinking coffee or stepping to the microphone, John visualizes it.

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[10]The gerunds in (69) are not intrinsically definite, but are being considered here under an interpretation as definite. Likewise, the *wh* adverbial construals in (70) are not intrinsically ungrammatical, but are so under the interpretation of the gerund as definite. Similar comments hold for the indefinites in (71) below, and the adverbial *wh* construals in (72).

(71) a. John always visualizes Bill's drinking of coffee
b. John always visualizes Bill's stepping to the microphone

With the interpretation of (71) on which *always* quantifies over the event position of the gerund, adverbial *wh* construal into the gerund is possible.

(72) a. How does John always visualize [Bill's drinking of coffee ___]
b. How does John always visualize [Bill's stepping to the microphone ___]

This completes an examination of adverbial *wh* construal into object gerunds. Note that argument extraction is free out of the contexts in (67) and (70).

(73) a. What$_i$ did John mention [Bill('s) capturing t_i]
b. [What animal]$_i$ did John imagine [Bill('s) holding off t_i]

We now turn to subject gerunds. The maximal projection of a complex subject is a barrier to antecedent government. Thus an adverbial *wh* element cannot extract from a subject gerund and antecedent govern its trace. This prevents construal with a definite subject gerund, as in the following.

(74) a. * How did [John's holding off of the tiger ___] make him famous
b. * How did [John's holding off the tiger ___] make him famous
c. * How did [John holding off the tiger ___] make him famous
d. * How did [PRO holding off the tiger ___] make John famous

However, on the analysis adopted here, indefinite gerund subjects, like indefinite gerund objects, have an open event position, and raise and adjoin to the matrix IP, where their event position is bound by an unselective

binder. This leads us to expect that adverbial *wh* elements can be construed with an indefinite subject gerund, as with an indefinite object gerund, by extracting from a position adjoined to IP, at which the event variable of the gerund is available for θ-identification with the event variable of the adverbial *wh* element, through its trace in this position. Surprisingly, in light of commonly observed extraction patterns, this seems to be the case.

(75) a. For what reason did [John's bursting into rooms ___] get him fired
b. For what reason did [John bursting into rooms ___] get him fired
c. For what reason did [PRO bursting into rooms ___] get John fired

(76) a. How would [John's holding off (of) a tiger ___] make him famous
b. How would [John holding off a tiger ___] make him famous
c. How would [PRO holding off a tiger ___] make one famous

Likewise, when the event position of a subject gerund is unselectively bound by an adverb of quantification, an adverbial *wh* can be construed with the gerund.

(77) a. How does [John's singing (of) that song ___] always cause Mary to shudder
b. How does [John singing that song ___] always cause Mary to shudder
c. How does [PRO singing that song ___] always make John lose his voice

Meanwhile, argument extraction out of these subject gerunds is as impossible as it is out of *that* -clause sentential subjects.

(78) a. * What song would [John's singing (of) t] make Mary shudder
b. * What song would [John singing t] make Mary shudder
c. * What song would [PRO singing t] make John lose his voice

So gerund subjects whose event position is unselectively bound, either by ∃ or by an adverb of quantification, constitute a domain out of which arguments cannot be extracted, but into which adverbial *wh* elements can be construed. The existence of such domains strongly supports the view that construal of adverbial *wh* elements is based in part on processes particular to adverbials.

3.2.4 Temporal adverbials

As discussed in Chapter 2, the sentences in (79) with temporal adverbials have the structure given in (80a), and the semantic representation given in (80b).

(79) a. John wrote his paper before he met Mary
b. John joined the Communist Party after he met Bill
c. John did the dishes while Mary read the newspaper

(80) a. John wrote his paper [$_{PP<>}$ before [$_{IP<e>}$ he met Mary]]
b. ∃e [write(J,his paper,e) & before(e,δe' [meet(J,M,e')])]

The temporal preposition which introduces the adverbial clause δ-binds the event position of the adverbial clause, as indicated in (80b). The adverbial PP is therefore a closed expression.

Since the PP node in (80a) is unselected, it is a barrier for antecedent government. Therefore, an adverbial *wh* element could not extract across this node, and antecedent govern its trace in a position where it could be construed with the event position of the adverbial clause. This explains the judgments in the following data.

(81) a. * How did John write his paper [before he met Mary ___]
b. * Why did John return from Europe [after he met Bill ___]
c. * How did John join the Communist Party [after he met Bill ___]
d. * How did Oliver ship the arms [while Bill duped the press ___]

3.2.5 Change/continuation of state verbs

Verbs like *stop* or *continue*, which indicate a change or continuation of state, were discussed in Chapter 2 in the context of sentences like those in (82).

(82) a. John stopped drinking coffee before bedtime
b. The army stopped killing students
c. John stopped Bill('s) embarrassing his wife
d. The security services continued torturing labor leaders

Adverbial *wh* elements cannot be construed into the complement of *stop* in (82a,b), but they can be construed into the complement of *continue* in (82d), as shown in (83).

(83) a. * Why did John stop [PRO drinking coffee before bedtime ___]
b. * How did the army stop [PRO killing students ___]
c. * How did John stop [Bill('s) embarrassing his wife ___]
d. Why did the security services continue [PRO torturing people ___]
e. How did the security services continue [PRO torturing people ___]

Contrast (83a,b,c) with the questions in (84), for which suitable answers with lower construal of the adverbial *wh* are given in (85).

(84) a. Why did John think about [PRO drinking coffee before bedtime ___]
b. How did the army think about [PRO killing students ___]
c. How did John consider [Bill('s) embarrassing his wife ___]

(85) a. In order to have productive dreams
b. By sending tanks onto the campus
c. By criticizing her in public

The account of (83) will depend on the structures put forth for these questions in Chapter 2. In particular, *stop* takes a definite gerund whose event position is discharged by the contents of D^o (for ing-of or POSS-ing) or of I^o (for ACC-ing and PRO-ing).

(86) a. $[_{CP}$ why$_i$ did $[_{IP}$ John stop $[_{IP<>}$ PRO I $[_{VP<e>}$ drinking coffee t_i]]]]
b. $[_{CP}$ How$_i$ did $[_{IP}$ John stop $[_{DP<>}$ Bill $[_{D}$'s] $[_{VP<e>}$ embarrassing his wife t_i]]]]

Since the complement of the gerund I^o or D^o is a barrier to antecedent government, it follows that the adverbial *wh* element cannot extract out of this complement, leaving a trace in a position where it can be construed with the event position of the gerund. Hence, it can only be construed with the matrix clause, yielding the interpretations indicated in (87), with the definiteness of the gerund displayed.

(87) a. Why did John stop δe[drink(PRO,coffee,e)]
b. How did John stop δe[embarrass(Bill,his wife,e)]

Turning to (83d,e), on the account of Chapter 2 the complement of *continue* is raised at LF and adjoined to the matrix VP, where its event position is θ-identified with the event position of the matrix verb. Hence, construal with the matrix clause is indistinguishable from construal with the embedded clause. The reason for John continuing to do X is the reason for the doing of X (at least in the continuation, even if it wasn't the original reason for doing X), and the manner of continuing to do X is just the manner of doing X (at least in the continuation).

Note that in (83a,b,c), where adverbial *wh* construal is blocked over *stop*, arguments extract freely.

(88) a. What$_i$ did John stop [PRO drinking t_i before bedtime]
b. Who$_i$ did the army stop [PRO killing t_i]
c. Who$_i$ did John stop [Bill('s) embarrassing t_i]
d. Who$_i$ did John stop [PRO asserting [t_i" Agr$_i$ [t_i insulted Bill]]]

This is in line with the paradigm, by now familiar, in which adverbial *wh* construal is blocked where arguments extract freely.

3.2.6 Iteratives and continuants

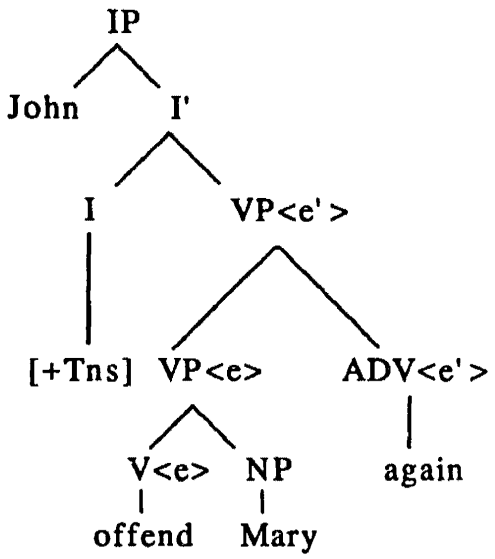
The sentences in (89) involve the structurally induced presuppositions indicated in (90).

(89) a. John offended Mary again
b. The flying saucer came again
c. The flying saucer is still spinning in the garden

(90) a. ∃e' again(δe[offend(John,Mary,e)],e')
b. ∃e' again(δe[come(the flying saucer,e)],e')
c. ∃e' still(δe[spin(the flying saucer,e)&in(the garden,e)], e')

The adverb *still* or *again* is adjoined to VP, where it δ-binds the event position projected from V, inducing the interpretations given in (90).

(91)



Nevertheless, adverbial *wh* elements can extract and be construed with the event position of the clause, as in the following.

(92) a. How did John [[offend Mary ___] again]
b. Why did the flying saucer [[come ___] again]
c. How is the flying saucer [still [spinning in the garden ___]]

This follows since the adverbial *wh* element in spec-CP can antecedent govern its trace adjoined low enough within VP to allow for θ-identification of its event position with that of the clause, undischarged within VP.

3.3 Referential Indices and Secondary Predicates

Following Cinque (1990) and Rizzi (1990), we assume that *wh* elements that are assigned a referential θ-role have a referential index, and are thereby capable of long movement. In the previous sections of this chapter, it has been argued that adverbial *wh* elements are construed by θ-identification of their event positions with the event position of the clause that they modify. Recall that adjectives are construed by θ-identification of

their open position with that of the head of the modified NP. We therefore do not expect them to be subject to limitations of extraction that derive from the mode of intepretation of adverbials. In the following data, an adjectival *wh* element in the matrix spec-CP can be construed in the position of a secondary (depictive) predicate over standard barriers for antecedent government, including obligatory complementizers, thus exhibiting a markedly different paradigm from that of adverbial *wh* elements.

(93) a. What color does John regret [that Mary painted the car ___]
b. What color does John believe [that Bill said [that Mary painted the car ___]]

c. What color did John state [that Bill said [that Mary painted the car ___]]
d. ? What color do you wonder [whether Mary painted the car ___]
e. ? What color do you wonder [who painted the car ___]
f. ? What color do you believe [the claim [that Mary painted the car ___]]

In (93), the adjectival *wh* behaves similarly to a referential element. Thus the split between *wh* elements which don't leave traces, and are construed by *wh* lowering, and referential elements is not simply a split between adjuncts and arguments.[11] In (93), the adjectival *wh* element behaves like

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[11]As noted by Rizzi (1990), further evidence that the distinction in question is not simply one between arguments and adjuncts is provided by the fact that selected adverbials, as in (i), are fully ungrammatical when questioned over standard islands, as shown in (ii).

(i) a. John worded the letter carefully
b. John behaved badly

(ii) a. * How badly does John wonder [whether Bill behaved ___]
b. * How carefully does John wonder [who worded the letter ___]
c. * How badly does John believe [the claim [that Bill worded the petition ___]]
d. * How badly does John believe the rumor [that Bill behaved ___]

In this respect, the selected *wh* adverbials, though arguments, behave like unselected adverbial *wh* elements.

an element with a referential index. There is, in fact, a way in which it could acquire a referential index, namely, through predication. Following Williams (1980), predication is coindexation of a predicate and its argument. We might therefore conjecture that a secondary predicate or other adjectival element gets a referential index from a referential element via predication. However, there are instances of secondary predicate *wh* elements which cannot extract over standard islands, including the following.

(94) a. * How raw do you wonder [whether John ate the meat ___]
b. * How fully loaded do you wonder [who flew the plane ___]

The conjecture thus cannot be true in this simple form. In order to clarify the issue, a brief examination will be made of when secondary predicate adjectival *wh* elements can undergo long movement. The focus will be on object oriented depictives since these are widely extractable (unlike some classes of subject oriented depictives which don't extract at all), though not uniformly so.[12]

As argued in Ike-Uchi (1991), the object depictive secondary predicates that extract most successfully are resultatives and other depictives which are generated lowest within the VP, closest to the verb. This is true as well for long movement of object depictives, as the contrast between (95) and (96)-(98) shows.

(95) a. * How cooked do you wonder whether the John ate the meat
b. * How cooked do you wonder who ate the meat

[12]For a thorough discussion of secondary predicates in English, and of their extraction properties by classes, see Ike-Uchi (1991).

c. * How cooked do you believe the claim that John ate the meat

(96) a. ? How ragged do you wonder whether they ran their Nikes
b. ? How flat do you believe the claim that John hammered the metal

(97) a. ? Which side up do you wonder whether John dropped the toast
b. ? Which side up do you wonder who dropped the toast
c. ? Which side up do you believe the claim that John dropped the toast

(98) a. ? How stupid do you wonder whether John considers Bill
b. ? How stupid do you wonder who considers Bill
c. ? How stupid do you believe the claim that John considers Bill

The examples in (96) involve resultatives, and those in (97) involve resultatives of a sort. The examples in (98) involve a small clause complement of *consider* from which the secondary predicate is extracted. The problem is to find what these all have in common with one another and with the case of straightforward adjectival modification involved in (93). Only a speculation can be offered in the present work. Note that the depictive predicates in (93) and (96)-(98) characterize the θ-role assigner as much as the θ-role assignee. In (93), the color semantically characterizes the act of painting: it is a painting red; *red* modifies not only the car but the process of painting. In (97), the side of the toast which surfaces after it drops characterizes the nature of the action of dropping. In (98), considering Bill smart is a semantically different way to consider him than considering him stupid; *stupid* modifies *consider* as well as *Bill.* In contrast, the connection between the quality assigned by the secondary predicate in (95) is related to the action denoted by the verb only by natural law or convention. This is recorded in the following.

(99) **Conjecture**: A secondary predicate has a referential index just in case it characterizes the θ-role assigner of its object. In this case, it has the referential index of its object.

This explains why the adjectival *wh what color* in (93) has the same distribution as a referential element: since it modifies both the object *the car* and the θ-role assigner *paint*, it acquires the referential index of its object. Not all adjectival *wh* elements have this distribution, as noted in the literature, which follows from (99) since not all adjectival *wh* elements modify the θ-role assigner of their object.

We can now extend the discussion to movement of some other predicates. First, note that VP preposing can take place quite readily over standard islands.

(100) a. ? Leave the room, I wonder whether Bill ever did
b. ? Leave the room, I wonder who did
c. ? Leave the room after the crime, I believe the claim that Bill did

(101) a. ? Leave the room, John didn't do for a moment
b. ? Leave the room, John never did

(102) a. Leave the room, John denies that Bill ever did
b. Leave the room, I remember that Bill did often

Thus, VP preposing exhibits the pattern for extraction of a referential element. The conjecture advanced in (99) will not directly cover the assignment of a referential index to VP. However, if we suppose that VP assigns a θ-role to the subject compositionally, as assumed in Chomsky (1981) and (1986b), we might understand the assignment of a referential index to VP as a reduced case of (99) where the predicate, rather than characterizing the θ-role assigner of its object, is identical to the θ-role assigner of its object. In this case, being identical to something can be

taken to be a limiting instance of characterizing it. Then VP acquires the referential index of the subject, so its capacity for long movement is accounted for.

Chapter 4

Wh Movement and Legitimate Objects at LF

On the account of adverbial *wh* extraction given in Chapter 3, adverbial *wh* chains cannot be established across complementizers which are obligatory on the surface and which are therefore, on the assumptions adopted here, present at LF. This holds for the obligatory complementizers in various Romance languages, and for English *that* in factive complements, and in propositional complements of the few verbs, such as *assert*, *speculate*, and *conjecture*, that require a complementizer in their tensed complements. The obligatory complementizer seems to establish IP as a barrier to antecedent government, or to induce some sort of Minimality effect. The purpose of the present chapter is to develop a theory of antecedent government which incorporates this effect of obligatory complementizers. With this theory of antecedent government, and the notion of a uniform LF object from Chomsky (Class lectures, Fall 1990), the theory of A' movement, developed along the lines of Lasnik and Saito (1984, forthcoming), can be considerably simplified.

4.1. Legitimate LF Chains

One of the central problems for the extraction theory of arguments and adjuncts is that adjuncts seem to extract freely over complementizers, which would produce *that*-trace violations for subject extraction within the same environment. This can be seen in (1).

(1) a. * Who$_i$ do you think [$_{CP}$ t_i' that [$_{IP}$ t_i won the race]]
b. Why$_i$ do you think [$_{CP}$ t_i' that [$_{IP}$ John fired Bill t_i]]

In light of the mechanisms of Chapter 3, the pair in (1) does not really illustrate the problem since it was described there how the adverbial *wh* element could be construed with the lower clause through its trace t_i' due to the accessibility of the event position of the lower clause projected up to the CP node of this clause. On these assumptions, the link (t_i', t_i) in the adjunct chain is not critical for the construal of the *wh* adverbial with the lower clause, so antecedent government across the complementizer is not a critical issue in (1b). However, with adjunct extraction from a more deeply embedded complement clause, as in (2), construal of the *wh* adverbial with the lowest clause can only be achieved through the chain of the moved element, so antecedent government across intervening complementizers is an issue in this example.

(2) Why$_i$ do you think [$_{CP}$ t_i" that [$_{IP}$ Mary said [$_{CP}$ t_i' that [$_{IP}$ John fired Bill t_i]]]]

For L&S, examples like these motivate the γ-assignment mechanisms, with different requirements on argument and adjunct traces, on which their theory of the ECP is based. In particular, since they require argument traces to be γ-marked at S-structure, the trace t_i in (1a) is marked [-γ] since the complementizer intervenes in antecedent government of t_i by t_i'. Adjunct traces, on the other hand, are not γ-marked until LF, at which point the complementizers in (1b) and (2) have deleted, allowing antecedent government of t_i and t_i' (as well as t_i") in (1b) and (2).

Certain features of the L&S theory are determined or influenced by the theoretical framework that it adopts. To begin with, L&S assume that

complement clauses have the structure [$_{S'}$ COMP [$_{S}$ ...]], where COMP takes the index of its head. Antecedent government by an element α in COMP is only possible when α is the head of COMP, and is actually realized as government by COMP, with the index of α. Antecedent government by α in COMP is blocked when there is a complementizer in COMP since the complementizer is the head of COMP and therefore blocks the transmission of the index of α to COMP. If we go along with much work of the past half decade and assume, following Chomsky (1986b), that the projection of C has the phrase structure [$_{CP}$ spec [$_{C'}$ C XP]], similar to that of other heads, then we lose the means by which L&S prevent antecedent government over a complementizer. In this case, the failure of antecedent government over a complementizer must be established in some other way. A way of realizing this will be discussed below.

As summarized in Chapter 1, L&S assume that argument traces are γ-marked at S-structure, while adjunct traces are γ-marked at LF. The γ feature is a binary feature, [$\pm\gamma$], with properly governed traces being assigned [$+\gamma$], and other traces being assigned [$-\gamma$]. γ-marking of argument traces is required at S-structure in order to record a *that*-trace violation that occurs at S-structure and which would disappear at LF upon deletion of the intervening complementizer. γ-marking of adjunct traces must be deferred until LF in order that adjunct traces such as those in (1b) and (2), separated from their antecedents by intervening complementizers at S-structure, will not be marked [$-\gamma$].

More recent work has provided notions which allow for a considerable simplification of the L&S extraction theory. In particular, Chomsky (Class

lectures, Fall 1990) suggests capturing properties of extraction theory by limiting allowable structures at LF through a classification of legitimate LF objects. The idea is to cut down on the chains that can be derived in the course of a derivation by assuming that all chains at LF must be uniform in the occurrence of A or A' positions within the chain. Without such a condition, the inventory of movement derived up to LF would be as shown in (3), derived as indicated.

(3)

a.	$(X^0, X^0, \ldots, X^0)$	head movement
b.	(A, A, ..., A)	A-movement
c.	(A', ..., A', A)	A'-movement of an argument
d.	(A', A', ..., A')	adjunct movement

(3a) is the configuration of a head movement chain, (3b) of a chain of A-movement, (3c) is the configuration for A'-movement of an argument, and (3d) for movement of an adjunct. All of these are uniform except (3c). In order to make (3c) uniform, all intermediate positions would have to delete at LF, yielding the structure (A',A). This is an operator-variable chain. The operator-variable structure must be included in any inventory of legitimate LF structures, indicating that the position of the operator is exempt from the condition of uniformity. Then (A',A) counts as a uniform chain. The legitimate chains at LF are then the following.

(4)

a. $(X^0, X^0, \ldots, X^0)$
b. (A, A, ..., A)
c. (A', A)
d. (A', A', ..., A')

The A'-movement of arguments and adjuncts thus involves two quite different kinds of chain at LF. The movement of an adjunct produces the structure (A', A', ..., A'), with antecedent government between successive

elements in the chain, whereas A'-movement of an argument yields an operator-variable structure (A',A) at LF, obtained by deletion of intermediate traces.[1] Frampton (1990a) arrives at this conclusion, arguing that the trace of (certain forms of) adjunct extraction is not a variable, and that the relationship between the head and tail of such a chain is not an operator-variable relation.

Adopting the requirement that LF chains must be uniform objects, we can formulate extraction theory under the following assumptions; these will be immediately illustrated in the examples that follow them.

(5) **Assumptions.**

1. Chains must be uniform at LF. Therefore intermediate traces of A'-moved arguments are deleted in the mapping from S-structure to LF.

2. Complementizers block antecedent government. In particular, in the following configuration, α cannot antecedent govern into IP.

(6) $[_{CP}\ \alpha\ [_{C}\ \text{that}]\ [_{IP}\ \ldots\ ]]$

3. Principle of Full Interpretation (FI). (Chomsky 1989) All elements present at LF must play an LF role.

4. Complementizers that are obligatory play an LF role and therefore must be present at LF.

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[1]Uniform chain requirements at LF do not necessitate deletion of intermediate traces of A-movement in (4b). Furthermore, following Rizzi (1990), we might say that the intermediate traces of A-movement are required to be present at LF for transmission of a θ-role or for the realization of θ-role assignment to a chain.

Note that in assumption 1 intermediate traces are assumed to delete in the mapping from S-structure to LF, rather than at LF. This is in contrast to some treatments in the literature, such as that of Epstein (1987), in which the deletions under consideration, of intermediate traces and complementizers, is part of an ordered list of procedures at LF. By assuming that the deletion is effected in the mapping from S-structure to LF, deletion is assimilated more closely to movement on the derivational conception, since movement on this conception occurs in the mapping between levels of syntactic representation; thus movement and deletion are more viably realizations of a more abstract rule AFFECT α. Furthermore, with deletion of complementizers and intermediate traces in the mapping from S-structure to LF, it is assured, without any ordering of LF procedures, that these elements will play no LF role.

Under these assumptions, consider some basic extraction examples, including those already discussed.

(7) a. Why$_i$ do you think [$_{CP}$ t_i' that [$_{IP}$ John fired Bill t_i]]
b. Why$_i$ do you think [$_{CP}$ t_i" that [$_{IP}$ Mary said [$_{CP}$ t_i' that [$_{IP}$ John fired Bill t_i]]]]

In (7), since the complementizers are not obligatory, they play no LF role, and therefore must delete in the mapping to LF according to the Principle of Full Interpretation. The chain (*why$_i$*, t_i", t_i', t_i), with antecedent government holding between successive members, is thus produced at LF in (7b), and it is a legitimate LF object. Note that the requirement of antecedent government on the traces in this chain is met only at LF since

the complementizer blocks antecedent government at S-structure. Similar comments hold for the chain (why_i, t_i', t_i) in (7a).

Next, consider the object extraction in (8).

(8) What do you think that John bought

Under the assumptions 1-4 above, we can get rid of θ-government as a means of object traces being properly governed.[2] Suppose that object extraction involves adjunction to VP and then further extraction, as shown in (9) below.

(9) $What_i$ do you think [$_{CP}$ t_i" that [$_{IP}$ John [$_{VP}$ t_i' [$_{VP}$ bought t_i]]]]

The VP adjoined trace t_i' antecedent governs the initial trace t_i. Since t_i' must delete in the mapping to LF in order to produce a uniform object at LF, namely the operator-variable chain ($what_i$, t_i), there are no antecedent government requirements on t_i' itself. Given that t_i' γ-marks t_i at S-structure, in order to keep a record of the licitness of t_i at LF where t_i' is missing, it follows that lexical government of t_i is not required. This allows the disjunction between θ-government and antecedent government in the formulation of the ECP to be eliminated in favor of antecedent government exclusively. This does not say at what level of the grammar a trace that appears at LF must be antecedent governed. This point will be taken up in connection with the next set of examples.

[2]The following discussion follows Chomsky (1986b) in using adjunction to VP to eliminate θ-government of an object in favor of antecedent government by the VP adjoined trace.

Now consider the *that*-trace violation in (1), repeated in (10a), alongside a grammatical instance of subject extraction from a complement clause in (10b).

(10) a. * Who$_i$ do you think [$_{CP}$ t_i' that [$_{IP}$ t_i won the race]]

b. Who$_i$ do you think [$_{CP}$ t_i' [$_{IP}$ t_i won the race]]

In both of (10a,b), the intermediate trace t_i' must delete in the mapping to LF in order to produce a uniform object (who_i, t_i) at LF. Thus, in (10a), t_i is not antecedent governed at either S-structure or LF, whereas in (10b), t_i is antecedent governed by t_i' at S-structure, but not at LF. Thus, for (10b) to be grammatical, and distinguished from (10a), antecedent government of t_i at S-structure in (10b) must make t_i licit at LF. The fact that t_i is antecedent governed at S-structure in (10b) must therefore be recorded at LF, to distinguish the LF of (10b) from that of (10a). Thus some sort of γ-marking mechanisms, or their equivalents, are necessary. However, it is not necessary, for the sake of these examples, to stipulate that γ-marking of argument traces takes place at S-structure. Given free application of γ-marking, only the application at S-structure will license t_i in (10b) (since t_i' is missing at LF), and either choice, to apply at S-structure or LF, fails to license t_i in (10a) (since the complementizer blocks antecedent government of t_i at S-structure, and t_i' is absent at LF.)

Free application of γ-marking produces the right result in (9) as well, since t_i' can γ-mark t_i at S-structure and then delete in the mapping to LF.

Recall that L&S require the feature specification [-γ] in (10a) to record the *that*-trace violation that occurs at S-structure so that record of the violation will not be erased at LF upon deletion of the complementizer *that*. However, this is not required under present assumptions since t_i', as well as *that*, is missing in the LF of (10a); the structure could then not be recovered by antecedent government of t_i at LF. We will adopt γ as a privative feature that is assigned to traces that are antecedent governed. A trace that is not antecedent governed emerges at LF with no γ feature at all. The ECP requirement is then that traces of a certain sort (to be specified in the following paragraph) must have the γ feature at LF.

Within the theoretical context adopted here, the scope of γ-marking turns out to be extremely limited. First note that for argument extraction, γ-marking is required only for the trace in the D-structure position of the argument since all intermediate traces will delete in the mapping to LF. Next, consider an adjunct chain $C=(\alpha_1, \alpha_2, \ldots, \alpha_n)$ at LF. In order for this to be a well formed LF object, it must be the case that α_i antecedent governs α_{i+1} for $i = 1, 2, \ldots, n-1$. But then the antecedent government requirements on successive elements within C is part of the well formedness conditions on C as an LF object, so they don't need to be stipulated as a separate ECP requirement on $\alpha_2, \ldots, \alpha_n$. Thus γ-marking is not needed for traces of adjunct movement. So as it turns out, γ-marking is only needed for the original trace of an argument, that is, the trace in the D-structure position of the argument. Therefore, there is no need to formulate the ECP generally in terms of γ-marking.

Based on the foregoing discussion, under the assumptions in 1-4 above, we adopt γ-marking only for the original trace of an argument, assuming that γ-marking is privative and specified to apply freely at S-structure or LF. A chain of A'-movement is then legitimate at LF if it is an instance of one of the schemata in (11), repeated from (4c,d) above.

(11) a. (A', A[γ])
b. (A', A', ..., A')

Hence γ is required on (and only on) the variable in an operator-variable structure at LF produced by A' movement of an argument. This use of the γ feature cannot be dispensed with in favor of a well formedness condition on the operator-variable chain in (11a) since the legitimacy of the variable is a matter of derivational history coded in the γ-feature, and there is no evident way to capture this information as a well formedness condition on the operator-variable chain at LF.

In summary to this point, adopt the following.

(12) **Extraction Theory**

1. Chains must be uniform at LF.
2. Complementizers block antecedent government.
3. Principle of Full Interpretation
4. Complementizers that are obligatory play an LF role and therefore must be present at LF.
5. The original trace of an argument must have γ at LF.

6. The feature γ is privative and is assigned strictly under the relationship of antecedent government. γ-assignment is available at both S-structure and LF.

The notion of antecedent government will be discussed in the next section.

Before leaving this section, we note some salient features of the theory of extraction delineated above, and some similarities with other recent proposals. Consider the following sentence from L&S (forthcoming).

(13) Who do you believe that Mary said left early

LF: [CP who$_i$ [C[do]I] [IP you believe [CP t_i" [C that]
[IP Mary said [CP t_i'[C] [IP t_i left early]]]]]]

In Chomsky (1986b) or L&S, an example like this would have involved a long chain of intermediate traces connecting t_i to *who$_i$*. Under the assumptions adopted here, t_i' antecedent governs t_i at S-structure, so t_i is assigned γ. Then all the intermediate traces delete in the mapping to LF.

Note that on this approach, the extraction of arguments over islands poses no problems for ECP considerations, provided the first link in the extraction is established, yielding the assignment of γ to the original trace of the argument. This is illustrated below.

(14) a. ? Who$_i$ does John wonder whether Bill said [t_i' [t_i likes Mary]]

b. ? What$_i$ does John know [$_{CP}$ who$_j$ [$_{IP}$ t_j [$_{VP}$ t_i' [$_{VP}$ bought t_i]]
c. ? Who$_i$ did John go to London [in order to [$_{VP}$ t_i'
[$_{VP}$ meet t_i]]]

In these structures, t_i' antecedent governs t_i, so t_i is assigned γ. Each of these movements, however, violates subjacency. See section 4.5 below concerning this. This is a reflection of differences between arguments and adjuncts that have been much discussed in recent literature. See Rizzi (1990), Cinque (1990), Frampton (1990), Kroch (1990), and Comorovski (1989) for discussion of the long movement possibilities of arguments as opposed to adjuncts.

4.2. Antecedent Government and Minimality

The generalization that emerges from the cases of adverbial *wh* extraction considered in Chapter 3, and incorporated into the extraction theory set forth in (12) above, is that adverbial *wh* elements can extract out of a tensed complement whose complementizer plays no semantic role, but not out of a tensed complement whose complementizer has a semantic function. By the Principle of Full Interpretation, it follows that adverbial *wh* movement out of a tensed complement is illicit just in case the complementizer of the complement clause is present at LF. This falls out readily within the framework of Lasnik and Saito (1984), which adopts the phrase structure [$_{S'}$ COMP [$_S$ ...]], where COMP is a single category headed by the complementizer of S' (if there is one), and serving as a landing site for A' movement. Lasnik and Saito assume that COMP takes the index of its head, if it contains a complementizer, and otherwise takes the index of the first element to move into it. Antecedent government by an

A' element α in COMP is realized as head government by COMP with the index of α. Within this framework, if the complementizer is present at LF, then no intermediate trace in COMP can antecedent govern into S', so no legitimate A' chain can involve an element in COMP. This phrase structure conflates the head and A'-specifier positions of the complementizer system. If this conflation is maintained for the complementizer system alone, then it makes the complementizer system an exception within X' theory, on no apprarent grounds other than stipulation. On the other hand, if the conflation of head and A'-specifier positions is maintained across categories, then much work of the past half decade, founded on the distinction between head and A'-specifier positions, must be revised or rejected. Therefore, this phrase structure will not be adopted here, and the uniform X' schema of Chomsky's (1986b) *Barriers* will be assumed instead, in which the structure of a tensed complement is given as follows.

(15) $[_{CP}$ spec $[_{C'}$ C^0 IP]]

The task at this point is to capture the effects of a complementizer in C on antecedent government.

We might suppose that IP is a barrier to government, contrary to *Barriers*; if some means could be found to void the barrierhood of IP just in case the complementizer is missing, then the desired results would follow. Furthermore, if it could be maintained, this approach would have the desirable consequence of removing the defectiveness of IP within the framework of *Barriers*. Note that the complementizer does not L-mark IP since it does not θ-mark IP. Thus IP remains a barrier for government so

long as the complementizer alone is present in C. In order to consider how the barrierhood of IP might be voided when C is empty, we will assume, in a tradition following Pesetsky (1982), that I raises to C at LF in indicative and complement clauses.[3] However, this will have to be implemented in light of the operations of head-to-head movement that combine a verb with its inflectional morphology, as set forth in Pollock (1989) and Chomsky (1989). Given the formation of the verbal complex [$_V$V-I], formed (in English) by I-to-V affix lowering, the movement of I-to-C at LF must be realized as movement of the complex [V-I] to C at LF. As with I-to-C in interrogative clauses, assume that [V-I] substitutes into C when C^o is empty. In this case, [V-I] in C is capable of L-marking IP (as must be the case if [V-I] is to govern its trace in I).[4] But when there is a complementizer in C^o, [V-I] cannot substitute into C, and so must adjoin to C instead. At this point, the analysis faces the question of whether [V-I] adjoined to C, with a lexical complementizer in C^o, will L-mark IP. There are two reasons why it must do so. First, [V-I] adjoined to C must L-mark IP in order to govern its trace in I. Second, in V-to-I languages, in which V raises and adjoins to I at S-structure, V occurring in the configuration [$_I$V I] must L-mark VP in order to antecedent govern its trace in V, despite the presence of lexical (inflectional) content in I. So in general it does not look like an L-marking head α, adjoined to another head β with lexical content in the configuration ... [$_\beta$ α β] γ ..., should be prevented from L-marking γ. So IP gets L-marked at LF in any event, whether or not there is a complementizer in C, so the presence of the complementizer has no effect

[3]Also, see Law (1991) for arguments that I raises to C at LF in complement clauses.
[4]This is extrapolated from the analysis of Chomsky (1989), in which a lexical head can L-mark the complement of a head into which it moves.

on antecedent government across IP. Thus, the attempt to capture the effects of a complementizer on antecedent government by appeal to the barrierhood of IP does not straightforwardly go through.

Instead of pursuing this approach, note that the effect of a complementizer on antecedent government is a sort of Minimality effect, along the lines of *Barriers*. In *Barriers*, Minimality is defined as follows [p.42].

(16) a. α does not govern β in (16b) if γ is a projection of δ excluding α.

b. $\ldots \alpha \ldots [_{\gamma} \ldots \delta \ldots \beta \ldots]$

More loosely put, for our purposes, an element α does not antecedent govern β across a head δ, where government across δ means government across any projection γ of δ to which α is not adjoined.[5] In this case, we can assume, as above, that IP is a potential barrier to government, but that the verbal complex [V-I] raised to C at LF L-marks IP, thus systematically voiding the barrierhood of IP in a complement CP, whether or not there is a complementizer in C at LF.

But the formulation of the Minimality Condition in *Barriers* creates a number of complications, some of them noted and discussed within *Barriers* itself. In order to prevent the head I from inducing Minimality effects anytime an adjunct is extracted out of IP, the I system was assumed in *Barriers* to be defective for the formulation of Minimality, as it was for

[5]We will assume that Minimality is not induced by an empty head X. We will not assume that X' is missing in this case, as Chomsky (1986b) does.

the definition of Blocking Categories. Furthermore, on this formulation, X' nodes must be absent when spec-XP is empty, as discussed in *Barriers* [p.47]. These, and other, complications arise since Minimality, as formulated in *Barriers*, applies to any head whatsoever, whether or not there are demonstrable Minimality effects induced by that head. In the remainder of this section, a framework will be developed which will capture Minimality effects with respect to certain heads, such as complementizers, but not with respect to others, such as V and I. What follows might be taken as a substitute framework which reduces the Minimality Condition of *Barriers* to a descriptive artifact. This is, however, not what is intended. What is intended is a set of conditions which will constrain Minimality to apply to heads which demonstrably exhibit (descriptively) Minimality effects, in particular, to nongoverning heads such as complementizers, and not to heads for which the application of Minimality creates complications.

Adopt the following definitions.

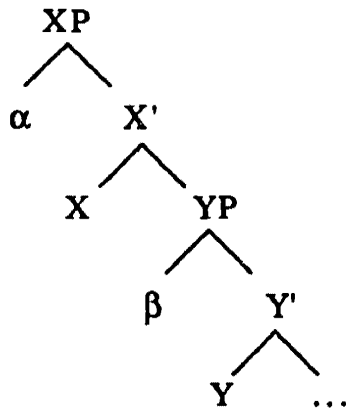
(17) α m-commands β iff α does not dominate β, β does not dominate α, and every maximal projection dominating α dominates β.

(18) α governs β iff
   a. α and β are mutually m-commanding, or
   b. α selects YP and β=Y or β is in spec-YP.[6]

[6]Kayne (1983a) argues for government of spec-CP by a verb selecting CP, and Stowell (1981) argues for government of C by a verb selecting CP. Kayne (1983d) argues that when N takes a clausal complement, N does not govern the subject position of this complement. If this is correct, then the condition (b) of (18) must be restricted so as not to hold for complements of N.

Following Chomsky (1986a), possible governors include N, V, A, P, NP, and VP. Going beyond this list, AP, PP, and CP will have to be governors given their possibilities for extraposition and/or *wh* extraction. Furthermore, for present purposes, INFL will have to count as a governor. The definition of m-command in (17) is due to Aoun & Sportiche (1983), except that we assume additionally that β does not dominate α so as to exclude m-command by X of X' and XP. The definition of government in (18) is essentially that given in Chomsky (1986a).[7] In particular, condition (b) is motivated by the configuration of ECM in which a verb, taking an IP complement, assigns case to the NP in spec-IP; assuming that this case assignment is under government by the verb, it follows that the verb governs the spec of its complement. Define the government domain (GD) of a head X as the set of all nodes that X governs. Consider the configuration in (19).

(19)



Then

(20) GD(X) = {α, YP, β, Y', Y}

[7]Chomsky assumes that when α governs YP then α governs Y and spec-YP. This would make a verb govern the specifier of an adjunct, which is not a desirable result for present purposes. So we use *select* instead of *govern* in (18b).

Assume that the government domains of V and I are fused into an extended government domain (EGD). This could be justified on the grounds that I is an extended projection of V, as a result of which INFL carries verbal features.[8] The EGD of the V-I system therefore is spanned by the subtree which extends from the IP node down to the head of the complement of V, if any. Define antecedent government as follows.

(21)
α antecedent governs β iff
a. α binds β (α c-commands β, and α and β are coindexed) and
b. There is an extended government domain containing both α and β.

But a means will be required to augment the extended government domain of the V-I system beyond IP. Notice that on the definition in (21), a *wh* subject extracted to spec-CP of a root clause will not antecedent govern its trace in spec-IP.

(22) $[_{CP}$ who$_i$ C^o $[_{IP}$ t_i left]]

In (22), if the structure remains as shown, the EGD of V-I does not extend beyond IP, so there is no EGD that contains both *who*$_i$ and t_i. However, based on auxiliary inversion over the subject, and *do* support in English, there is reason to believe that I raises to C in [+wh] clauses, including matrix questions. Suppose that when C^o is empty, I substitutes into C. In this case, the presence of verbal features in C should extend the EGD of the V-I system to include the C system. Then EGD(V-I) includes the contents

[8]The EGD of V and I, defined as the union of the GDs of V and I on the grounds that I is an extended projection of V, is essentially equivalent to Chomsky's (Class lectures, Fall 1989) notion of L-related, defined as follows: α is L-related to β if α is governed by a projection of β, β a lexical category, where I is an extended projection of V.

of spec-CP. It follows that *who*$_i$ will antecedent govern its trace in (23), the LF of (22).

(23) [$_{CP}$ who$_i$ [$_C$ I] [$_{IP}$ t_i left]]

Return now to the basic *that*-trace violation discussed in the previous section.[9]

(24) * Who do you think that won the race

LF: [$_{CP}$ who$_i$ [$_C$[do]I] [$_{IP}$ you think [$_{CP}$ t_i' [$_C$[that]I] [$_{IP}$ t_i won the race]]]]

For this example, and many more to be dealt with in this chapter, assume as above that I raises to C at LF in indicative clauses and complement clauses.[10] As above, within the context of Pollock (1989) and Chomsky (1989), the heads V and I have been combined at S-structure into a complex head [V-I], and I-to-C raising at LF is implemented as movement of [V-I] to C in the mapping to LF. Furthermore, if the barrierhood of IP needs to be voided, the implementation of I-to-C as movement of [V-I] to C is critical in order to L-mark IP. Nevertheless, for expository convenience, the movement of [V-I] to C in the remainder of this chapter will be referred to and indicated as I-to-C movement.

As with I-to-C in interrogative clauses, assume that I substitutes into C when C^0 is empty. In this case the verbal features of I are transmitted to C^0, so the EGD of V and I is extended to the C system of the clause. But when there is a complementizer in C^0, it will not be possible for I to

[9]Cases of wh-in-situ will be discussed in section 6 below.
[10]Also, see Law (1991) for arguments that I raises to C at LF in complement clauses.

substitute into C. Assume that I adjoins to C when there is a complementizer in C^o, and that in the resulting configuration, the verbal features of I are not transmitted to C. Now return to the example in (24). With the complementizer *that* present in the lower clause in (24), I adjoins to C, and the C system of the lower clause remains outside the EGD of the lower V-I system. Thus, by (21), t_i' does not antecedent govern t_i at S-structure. Since the complementizer is optional, it deletes in the mapping to LF, but this is too late for γ-marking of t_i since t_i' is also missing at LF. Now consider this example with the complementizer absent.

(25) Who do you think won the race

LF: $[_{CP}$ who$_i$ $[_C$[do]I] $[_{IP}$ you think $[_{CP}$ t_i' $[_C$I]
$[_{IP}$ t_i won the race]]]]

When the lower C is empty, as in (25), I substitutes into C; then the verbal features of [V-I] are transmitted to C, making the lower C system part of the EGD of [V-I], and then t_i' antecedent governs t_i by (21). Furthermore, due to the presence of the verbal element *do* in the matrix spec-CP, the matrix C system is part of the EGD of the matrix V-I, as is the lower spec-CP, so *who$_i$* antecedent governs t_i' in (25).

The next task is to consider more extensively the configurations under which GDs are united into EGDs. Before doing this, however, the new assumptions adopted so far in this section are summarized.

(26) **Assumptions.**

1. I-to-C raising occurs at LF in indicative clauses and [-wh] complement clauses, in addition to I-to-C at S-structure in interrogatives and [+wh] complements.

2. I-to-C takes the form of

   a. substitution of I into C^0 if there is no complementizer

   b. adjunction of I to C^0 if a complementizer is present in C.

3. If I substitutes into C, in the mapping to S-structure or to LF, then the verbal features of [V-I] are transmitted to C, and so spec-CP becomes part of the EGD(V-I), so a constituent in spec-CP can antecedent govern into IP. If I adjoins to C, then the verbal features of [V-I] are not transmitted to C, and the C system is not included in the EGD(V-I).

We now consider more closely the conditions under which GDs are extended to EGDs. First we record the EGDs that are formed in the structures we have already looked at. These structures are the following, with EGDs as indicated.

(27) a. Who_i does John think [$_{CP}$ t_i' [$_C$ [that] I] [$_{IP}$ t_i left]]
++++++++++++++++++++++++++++ ----------

b. Who_i does John think [$_{CP}$ t_i' [$_C$ I] [$_{IP}$ t_i left]]
++++++++++++++++++++++++
----

c. [$_{CP}$ Who_i [$_C$ I] [$_{IP}$ t_i left]]
++++++++++++++++++

As discussed above, the presence of I with verbal features in the complement C^0 extends the EGD of the complement V-I to the C system of this clause. However, the EGD of the lower clause does not fuse with the

EGD of the higher clause to form one EGD comprehensive of the entire sentence. That this is the case can be seen by creating a *wh* island and extracting an adjunct over this island, as follows.

(28) a. * Why$_i$ does John wonder [$_{CP}$ who$_j$ [$_C$ I] [$_{IP}$ t_j [[left] t_i]]]
++++++++++++++++++++++++++++++
---

b. * How$_i$ did John ask [$_{CP}$ what$_j$ [$_C$ I] [$_{IP}$ Bill [[fixed t_j] t_i]]]
++++++++++++++++++++++++++

The adverbial *wh* element in the matrix spec-CP does not antecedent govern its trace in the lower clause in (28). Thus the presence of I in C^o does not fuse the EGD of the lower clause with that of the higher clause. This might be because EGDs are intrinsically clause bound by definition. But consideration of further cases will suggest more general structural constraints on the extension and fusion of EGDs.

To consider one such further case, adjunct extraction from out of multiple ECM complements indicates that the EGDs of separate V-I systems unite into a larger extended government domain when they overlap. This is illustrated in the following example.

(29) Why does John believe [Bill to require [Sam to fix the car ___]]

LF: [$_{CP}$ why$_i$ [$_C$[does]I] [$_{IP}$ John believe [$_{IP}$ Bill to require
[$_{IP}$ Sam to fix the car t_i]]]

There are no intermediate landing sites at the boundaries between clauses for the movement of the adverbial *wh* in (29). Furthermore, the event position of the lowest clause is not available at any point that would allow *why$_i$* to be construed with it without moving across clauses. Therefore

why$_i$ must antecedent govern t_i in (29). From this we conclude that the EGD of the matrix clause in (29) fuses with the EGDs of each complement clause, producing one EGD comprehensive of the entire sentence. At this point, we ask what conditions the extension of the clausal EGDs in (29) into one larger EGD? The EGDs of successive clauses overlap, but this in itself cannot be the structural feature operant for the fusion of EGDs. For if simple overlap sufficed to stitch together EGDs, then the complement clause in (28) would constitute an EGD with its superordinate clause, allowing the extractions given there, as follows. After I-to-C raising applies in the lower clause in (28), the C system of that clause will be part of the EGD of V-I. Then the EGD of the lower clause will overlap at spec-CP with that of the higher clause, so if simple overlap fuses EGDs, then *why*$_i$ and *how*$_i$ will antecedent govern t_i, yielding the wrong result.[11] Noting that exceptional case marking is involved in (29), another conjecture would be that case marking across the boundary of two EGDs suffices to fuse them into one. However, the following example shows this to be false.[12]

(30) Why does Bill seem to be expected [to leave ___]

---

[11]Note that if t_i is adjoined to the lower IP in (28), then the movements in (28) could be argued to exhibit crossing of paths, which would rule it out independently. (See Pesetsky 1982 and 1987.) In the case at hand, the paths would actually cross only at a segment of the complex IP node formed by adjunction, which makes it unclear whether this should count as a crossing of paths.) However, the derivation shown in (28), with t_i adjoined to VP, is nevertheless available, so if overlap of EGDs in (28) sufficed to fuse them, then this derivation would produce a grammatical structure, contrary to fact. We conclude that there should be no general principle that overlap of EGDs suffices to fuse them.

[12]I am indebted to N. Chomsky (p.c.) for this point and for the example.

LF: [$_{CP}$ why$_i$ does [$_{IP}$ Bill$_k$ seem [$_{IP}$ t$_k$' to be expected [$_{IP}$ t$_k$ to leave t$_i$]]]]

In (30), there is no case assignment across the IP complement of *seem*. Nevertheless, the extraction is good, with antecedent government of t_i by *why$_i$*, indicating that the entire sentence is one EGD.

I will suggest instead that the structural feature conditioning the fusion of GDs and EGDs is the presence or absence of independent tense operators. Specifically, two overlapping GDs or EGDs which contain independent tense operators cannot fuse, whereas two overlapping GDs or EGDs can fuse when they do not contain independent tense operators. I will say that two tense operators are independent when they are distinct and they have independent [Tns] specifications for [±past]. The possibility that infinitivals might have a [Tns] operator, but one unspecified for [±past] derives from Stowell (1982).[13] He argues that when a clause lacks a [Tns] operator specified as [±past], then its tense is dependent on the tense of its superordinate clause. The claim here is that ECM infinitival complements lack a [Tns] operator specified for [±past]. This might be because they lack a [Tns] operator altogether (they might have an empty I or T node), or because their [Tns] operator is necessarily unmarked for [±past]. Now consider the structure of multiple ECM complementation.

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[13]Stowell claims that the absence of an independent [Tns] operator is evident in the infinitival complement in (ia), in contrast with the gerund complement in (ib).

(i) a. John tried [PRO to unlock the door]
b. John tried [PRO unlocking the door]

The sentence in (ia) can mean that John tried to unlock the door without success, whereas that in (ib) means that John actually unlocked the door, in the course of trying of trying it out, to see what it is like, or in trying to achieve some further end. The reading in (ib) in which the unlocking of the door is actually achieved by John is supposed to be due to the presence of an independent [Tns] operator in the gerund complement.

(31) Why does [John believe [Bill to require [Sam to fix the car ___]]]
++++++++++++++++
----
ooooooooooooooooooooooo

For each instance of IP infinitival complementation, the higher verb governs the IP, spec-IP, I', and I nodes of the complement. Thus the EGD of the lower clause overlaps that of the higher clause at these four nodes. Since the infinitival complement in each case lacks an independent [Tns] operator, its EGD fuses with that of the higher clause. Thus in (31), the three EGDs indicated fuse into one, so *why* can antecedent govern its trace in the position of the gap indicated. In (30), the infinitival complements will likewise lack an independent [Tns] operator, so the EGDs of these clauses fuse with one another and with the EGD of the matrix.

The system of assumptions in (26) is thus expanded to that in (32), adding the condition in 4.

(32) **Assumptions.**

1. I-to-C raising occurs at LF in indicative clauses and [-wh] complement clauses, in addition to I-to-C at S-structure in interrogatives and [+wh] complements.

2. I-to-C takes the form of

   a. substitution of I into C^0 if there is no complementizer

   b. adjunction of I to C^0 if a complementizer is present in C.

3. If I substitutes into C, in the mapping to S-structure or to LF, then the verbal features of [V-I] are transmitted to C, and so spec-CP becomes

part of the EGD(V-I). If I adjoins to C, then the verbal features of [V-I] are not transmitted to C, and the C system is not included in the EGD(V-I).

4. Two overlapping GDs or EGDs can fuse into one EGD if and only if they do not contain independent tense operators.

Under these assumptions, A-movement in raising is allowed by the fact that the [Tns] operator of the IP infinitival complement is dependent on that of the next higher clause, so the EGD of the IP infinitival fuses with that of the higher clause. Thus *John$_i$* antecedent governs t_i in the following.

(33)

a. John$_i$ seems [t_i to like Boston]
b. John$_i$ is expected [t_i to like Boston]
c. We expect Bill$_i$ [t_i to have gone to Boston]
d. We believe Bill$_i$ [t_i to have gone to London]

The fusion of EGDs in these examples is indicated by the possibility of adverbial *wh* extraction, as follows.

(34)

a. Why$_i$ does John$_j$ seem [t_j to like Boston t_i]
b. Why$_i$ is John$_j$ expected [t_j to like Boston t_i]
c. Why$_i$ do you expect Bill$_j$ [t_j to have gone to Boston t_i]
d. Why$_i$ do you believe Bill$_j$ [t_j to have gone to London t_i]

However, if an IP infinitival is embedded under a tensed clause, an NP cannot raise over the tensed clause. The resulting configuration is called super raising in the literature, and is illustrated in (35), which can be contrasted with (36).

(35)

a. * John$_i$ seems [that it is likely [t_i to go to Boston]]
b. * John$_i$ seems [that it is expected [t_i to wash the dishes]]

(36) a. It seems [that John$_i$ is likely [t_i to go to Boston]]
b. It seems [that John$_i$ is expected [t_i to wash the dishes]]

In (35), the EGD of the IP complement fuses with that of the tensed complement, but the EGD of the tensed complement extends only up to the CP node of this complement. Thus *John$_i$* does not antecedent govern t_i in (35).[14] A similar explanation rules out nonlocal passivization of the sort illustrated in (37a) (sometimes called super passive); contrast with (37b).

(37) a. * John$_i$ seems [that [it was told t_i [that Mary will be fired]]]
b. It seems [that [John was told [that [Mary will be fired]]]

We are assuming that the [Tns] operator in infinitivals is unspecified for [±past], which we will indicate by saying that INFL in such clauses has the tense operator [ϕTns]. Furthermore, we assume that I[ϕTns] is not capable of discharging the event position of its clause. This shows that I[ϕTns] is weaker than I[Tns][±past]] in that it lacks one of the capabilities of the tensed INFL. Nevertheless, the GD of I[ϕTns] fuses with the GD of the infinitival verb, as indicated by the possibility of raising from object to subject position in an infinitive, which requires antecedent government from a position in GD(I) of a position in GD(V).

(38) We want [John$_i$ to be elected t_i]

In view of this state of affairs, we might ask whether I[ϕTns] raised to C in a CP infinitival is capable of extending the EGD(V-I) to the C-system.

[14]If raising in (35) proceeded through spec-CP, leaving an intermediate trace there, then this trace could assign γ to t_i, and then delete in the mapping to LF. However, this derivation would violate binding theory since the A-trace, t_i, is an anaphor which would not be bound within its governing category at S-structure. Thanks to Sabine Iatridou for discussion of this example.

Examples of the following sort provide instances in which, under the assumptions adopted here, I[ϕTns] raises to C in an infinitival CP.[15]

(39) Why did John try to visit Mary

LF: Why$_i$ did John try [$_{CP}$ t_i' [$_C$ I[ϕTns]] [$_{IP}$ PRO to visit Mary t_i]]

But this example does not show that I[ϕTns] has extended the EGD(V-I) to the C system since, on the mechanisms developed in this dissertation, construal of *why* with the infinitival complement in (39) could be obtained without antecedent government of t_i by t_i', namely, through θ-identification of the event position of *why* with that of the infinitival clause, projected to the C' node of the infinitive.

A suitable diagnostic for whether I[ϕTns] extends the EGD of its clause is provided with stacked infinitival CP complements, as in (40).

(40) a. Why does John want to try [to be hired ___]
b. Why does John need to want [to be accepted ___]

The relevant LF structure of these examples is shown in (41).

(41) Why$_i$ does John want [$_{CP}$ t_i" [$_C$ I[ϕTns]] [$_{IP}$ PRO to try [$_{CP}$ t_i [$_C$ I[ϕTns]] [$_{IP}$ PRO$_j$ to be hired t_j t_i]]]]

The intended interpretations of these sentences are perfectly clear. The intended interpretation in (40a) would arise if John is trying to get hired for a job which is ill-matched to his qualifications; a suitable answer would be "For his journalism experience". The intended interpretation of (40b) might arise in a psychological therapy session; a suitable answer in (40b)

[15]Pesetsky (Class lectures, Fall 1989) has argued that the infinitival in (39) is a full CP.

would be that John needs to try to be accepted by others for himself, and not just for his accomplishments. Insofar as these sentences have these interpretations, they indicate that I[ϕTns] in C has extended the EGD(V-I) to the C system in each of the embedded clauses, yielding the chain (why_i, t_i", t_i', t_i) as a well formed LF object. If they do not have these interpretations, this indicates that an infinitival I[ϕTns] is incapable of extending the EGD of its clause. The interpretations in question seem, in fact not to be readily available.[16] Therefore, it will be assumed that the INFL of infinitival CPs is not capable of extending the EGD of the infinitival clause. This will have implications for the analysis of some examples in section 4.5 below.

A more striking confirmation of assumption 4 within the context of the system (32) is provided by the following contrast.

(42) a. * Why did John propose [that Mary said [that Bill quit ___]]
b. Why did John propose [that Mary suggest [that Bill be fired ___]]

In (42a), *propose* takes an indicative complement, and means something like "put forth as an explanation". In (42b), *propose* takes a subjunctive complement. Assuming that the subjunctive complement does not have an independent tense operator, it follows from the assumptions in (32) that *why* antecedent governs its trace in the lowest clause in the LF of (42b), given in (43).

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[16]Similar questions with *how* or *how quickly* in place of *why* seem to more readily allow the corresponding interpretations.
(i) a. How does John want to try [to be regarded ___]
b. How quickly does John want to try [to be accepted ___]
I have no account of this difference at the present time.

(43) Why$_i$ did John propose [$_{CP}$ [$_C$ [that]I[ϕTns]] [$_{IP}$ Mary suggest [$_{CP}$ [$_C$ [that]I[ϕTns]] [$_{IP}$ Bill be fired t_i]]]]

By (32,4), EGDs can fuse when they do not contain independent tense operators. Since the tense operator of the subjunctive is dependent on that of the higher clause, it follows that INFL of the subjunctive clause sitting in COMP in (43) does not prevent fusion of the EGDs of the clause of *propose* and its complement clause, and likewise, of the clause of *suggest* and its complement clause. Thus even though the complementizer is obligatory in the complement of *propose* in (42b), antecedent government can be established over this complementizer due to the dependent nature of the tense operator of the subjunctive clause. In (90a), however, where the complementizer in the complement of *propose* is also obligatory, the tensed INFL raised to C has an independent tense operator from that of the higher clause; thus fusion is not possible between the EGD of the clause of *propose* (the matrix clause) and the EGD of the complement of *propose*, so the construal in (42a) is not derivable.

Next, consider the [+wh] complements of verbs like *wonder*.

(44) a. * Who do you wonder whether saw John
b. * Why do you wonder [whether [John hired Bill __]]

(45) a. * Who$_i$ do you wonder [what$_j$ [t_i bought t_j]
b. * Why$_i$ do you wonder [what$_j$ [John [bought t_j] t_i]]

In (45), we might assume that there is a null WH complementizer in C^o of the complement clause, or that C^o is empty. But the account goes through equally well in either case. If there is a null WH complementizer, then the EGD of the lower clause extends no further than the IP node of

that clause, whereas if C^o is empty in the lower clause, then the EGD of that clause extends up to the CP node of that clause. But in either event, *who*$_i$ / *why*$_i$ does not antecedent govern its trace t_i, so the structure is out.

In (44), if *whether* is in spec-CP, as argued by Iatridou (1991), then the explanation for (44) is identical to that for (45), based on the possible structures shown in (46).

(46) a. [$_{CP}$ whether [$_C$ WH] [$_{IP}$ ...]]
b. [$_{CP}$ whether [$_C$] [$_{IP}$ ...]]

Assuming that *whether* is in spec-CP, the structure in (46b) with empty complementizer will be used in section 4.5 below to account for some differences in subjacency effects for extraction out of tensed and infinitival *whether* complements.

Finally, the account of the adjunct island in (47) below will highlight a fine point of the definition of government given in (18), repeated below.

(47) * How is it time [for John to fix the car ___]

(18) α governs β iff
a. α and β are mutually m-commanding, or
b. α selects YP and β=Y or β is in spec-YP.[17]

The structure of the example in (47) is shown in (48).

(48) How$_i$ is it time [$_{CP}$ t_i' for [$_{IP}$ John to [[fix the car] t_i]]]

[17]Kayne (1983a) argues for government of spec-CP by a verb selecting CP, and Stowell (1981) argues for government of C by a verb selecting CP. Kayne (1983d) argues that when N takes a clausal complement, N does not govern the subject position of this complement. If this is correct, then the condition (b) of (18) must be restricted so as not to hold for complements of N.

In this question, the adjunct CP is not selected. Since we have chosen *select* instead of *govern* in (18b), it follows that in (48), the matrix V (or I) governs only the CP node of the adjunct, not spec-CP and C^o. Therefore the intermediate trace t_i' fails to be antecedent governed. Thus, since the intermediate trace is required to form a legitimate chain at LF, adjunct extraction from an adjunct island, as in (47), is blocked.

4.3. Complementizer Agreement and the COMP-trace effect

In embedded clauses in West Flemish, there is a pattern of complementizer agreement with the embedded subject, as discussed in Bennis and Haegeman (1983), Haegeman (1990), and Law (1991). There is also a lack of COMP-trace effects upon subject extraction from [-wh] embedded clauses. In the present discussion, an account of the complementizer agreement phenomenon will be adopted from Law (1991), and it will be shown that the lack of COMP-trace effects follows readily in terms of the theory of antecedent government developed here. The account extends readily to the *que/qui* alternation exhibited by subject extraction in French. I am indebted in this section to Law's (1991) discussion of the complementizer agreement phenomenon, and its effect on subject extraction, although the mechanics of the ECP as developed here are quite different from those invoked by Law.

As exhibited below, there is a pattern of complementizer agreement with an embedded subject in West Flemish.[18]

(49)
a. K weten dan-k (ik) goan weggoan
I know that I go leave
"I know that I am going to leave"
b. Kweten da-j (gie) goat weggoan ("that you leave")
c. K weten da-j (ij) goat weggoan ("that he leave")
d. K weten da-se (zie) goat weggoan ("that she leave")
e. K weten da-t (tet) goat weggoan ("that it leave")
f. K weten da-me (wunder) goan weggoan ("that we leave")
g. K weten da-j (gunder) goat weggoan ("that you leave")
h. K weten dan-ze (zunder) goan weggoan ("that they leave")
i. K weten da Jan goat weggoan ("that Jan leave")
j. K weten dan Jan en Marie goan weggoan ("that Jan en Marie leave")

As an account of this agreement, assume, following Law, that the complementizer with its ϕ-features (person, number, and gender) is freely inserted. Subsequent processes in the grammar then validate this insertion, leading to a grammatical structure, or fail to validate it, leading to an ill-formed structure. In particular, assume with Law, and in line with the assumptions of this chapter, that I raises and adjoins to C at LF.[19] If the ϕ-features of C and the I adjoined to it match, then the structure is acceptable and the complementizer that was freely inserted is thereby validated. If the ϕ-features of C and the I adjoined to it don't match, then the structure is out due to a clash of features; in this case, the freely inserted complementizer is not validated.

[18]Data from Bennis and Haegeman (1983) and Haegeman (1990), reproduced in Law (1991).
[19]It might be that INFL alone raises to C, or, as Law assumes, that the V-I complex formed by V-to-I raising does so. This doesn't matter for present purposes.

The following data, consisting of some West Flemish relative clauses, show an optional alternation between the complementizer *da* and a form *die*. (From Law 1991).

(50) a. Den vent da/*die Jan gezien heet
the man that J 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 J thinks that M 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 J says that here been has
"the man that Jan says that has been here"

Following Law, assume that the form *die* is a complementizer reflecting the extraction of a subject agreeing with it. The structure relevant to the occurrence of *die* is therefore the following, in (51a) for (50b), and (51b) for the lowest clause in (50d).[20]

(51) a. $[_{CP}\ wh_i$ da/die $[_{IP}\ t_i \ldots]]$
b. $\ldots [_{CP}\ t_i'$ da/die $[_{IP}\ t_i \ldots]]$

And as (50d) illustrates, the *die* form must occur adjacent to the extraction site of the subject; thus (52).

(52) * $[_{CP}\ wh_i$ die $[_{IP} \ldots [_{CP}\ t_i'$ da/die $[_{IP}\ t_i \ldots]]]]$

This is the basic outline of the phenomenon.

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[20]Following Chomsky (1977, 1981, 1986b), assume that relative clause formation involves movement of an operator, identified here as *wh* following Chomsky (1977), by *wh* movement to a position where it can be identified with the head of the relative.

Within the extraction framework developed here, this pattern follows directly from the account of complementizer agreement given above. Assuming that the occurrence of *die* reflects complementizer agreement with the subject, it follows that when *die* occurs, INFL has raised and adjoined to C, validating the ϕ-features of the complementizer. It follows that, when *die* occurs, the EGD of I and its associated V is extended to the C system in which *die* occurs. Thus a *wh* operator or an intermediate trace of the subject in spec-CP antecedent governs the initial trace in spec-IP. For example, the LF configurations of (50b,d) are the following, with relevant EGDs marked below the examples.

(53) a. [NP den vent [CP wh_i [C [die]I] [IP t_i hier geweest heet]]]
++++++++++++++++++++++++++++++

b. [NP den vent [CP wh_i da [IP Jan zegt [CP t_i' [C [die]I]

++++++++++

[IP t_i hier geweest heet]]]]]
++++++++++++++++

In the CP of (53a), both wh_i and t_i are contained within the EGD of the clause containing the subject trace; thus wh_i antecedent governs t_i. Likewise for t_i' and t_i in (53b). Something more must be said to limit *die* to introducing clauses from which the subject has extracted; see Law (1991) on this point.[21,22]

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[21]On the account of Law, the complex [V-I] in C acts as a head governor of the initial trace of the subject in spec-CP, and L-marks IP allowing for antecedent government of this trace by the *wh* or intermediate trace in spec-CP. This appeals to a conjunctive formulation of the ECP, as proposed in Rizzi (1990), among other sources.

[22]The subject cannot extract over *ofda*, the equivalent of *whether* in West Flemish. Following Law (1991), assume that *ofda* is composed of two morphemes, *of*, in spec-CP, and the complementizer *da*, in C^0. Then the configuration of *ofda* is as follows.

(i) ...[CP of [C da] [IP ...

The account of the *que/qui* alternation in French is similar to the above.[23]

4.4 Inner Islands

In previous sections of this chapter, factive islands were analyzed as Minimality effects, due to the failure of the EGD(V-I) to extend to the C system when the complementizer *that* has a semantic function and is therefore present at LF. The weak islandhood of response stance complements, and of the few propositional complements which take an obligatory complementizer, follows on the same grounds. In the case of inner islands, induced by negation, there is no complementizer to appeal to. Nevertheless, inner islands can be accounted for on the basis of the mechanisms developed here, as will be discussed below.

The extraction data of interest to us regarding negation include the following.

(54)
a. * Why didn't John [leave ___]
b. * How didn't John [fix the car ___]
c. * Why didn't John say [that Max drove to Boston ___]

But then even if I raises to C and extends the EGD of the IP to include the C system, there will be no landing site for the relative *wh* operator in spec-CP where it (or an intermediate trace of it) can antecedent govern the initial trace in spec-IP. Therefore the analysis of Law in (i) is sufficient to rule out subject extraction over *ofda* on the formulation of the ECP adopted here as strict antecedent government.

[23]German and Dutch also show a lack of COMP-trace effects, but with no overt morphological complementizer agreement. To account for this, we would have to assume that there is nevertheless complementizer agreement with the subject in these languages, although it is not overtly manifested.

d. * Why did John say [that Max wasn't angry ___]
e. Who didn't John hire t

As noted in the literature, the construals indicated in (54a,b,c,d) can be obtained if negation (and the constituent it is cliticized onto, if any) is stressed. This amounts to focussing negation, and yields a different structure, which will not be addressed here. The form in (54e) just confirms the weakness of the island induced by negation.

Following much recent literature (especially Pollock 1989, Chomsky 1989) I'll assume that in sentences with negation there is a head Neg projected between IP and VP. In examples like *John didn't fire the gun*, negation occurs cliticized onto an auxiliary verb, which we assume to be in I. In this case, then, Neg has raised to I by head movement. In examples like those in (54), negation occurs cliticized onto an auxiliary that has raised to C. In examples like these, Neg has raised to I, and the complex head [Neg-I] has then raised to C at S-structure. There are examples in which Neg does not seem to raise to I at S-structure, such as in *John would always not wash the dishes*, or *Why did John not wash the dishes*. Given that Neg sometimes combines with I at S-structure, and given that we are assuming that I moves to C at LF, if it hasn't already by S-structure, the question arises whether Neg might uniformly move to I at LF, and then move with I to C, if it has not already done so by S-structure. This might, for example, be a precondition for the interpretation of Neg.

The scope interactions of Neg with the quantifier in (55) are problematic for these assumptions.[24]

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[24]I am indebted to discussion with David Pesetsky on this point.

(55)
a. Someone didn't leave
b. Why didn't someone leave

In (55a), the quantifier *someone* has wide scope with respect to negation; the meaning is $\exists x \sim leave(x)$, or with event structure represented, $\exists x \sim \exists e[leave(x,e)]$. In (55b), on the other hand, the quantifier *someone* has narrow scope with respect to negation; the meaning is that depicted in (56).

(56)
a. [for what reason φ] $\sim \exists x$[leave(x) for reason φ]
b. [for what reason φ] $\sim \exists x \exists e$[leave(x,e) & because(e,φ)]

Assuming that the subject quantifier in (55) is adjoined to IP at LF (May 1985, 1977), it appears that Neg is lower than IP at LF in (55a), and Neg is higher than IP at LF in (55b). But if Neg has raised to I in (55a), and if I raises to C at LF, then Neg should be above IP at LF, giving it scope over the quantified subject in (55a), contrary to fact. However, quantifier scope interactions with Neg are on the whole quite equivocal. The sentence in (57) has both of the interpretations shown in (58).

(57) Everybody didn't leave

(58)
a. $(\forall x) \sim leave(x)$
b. $\sim (\forall x) leave(x)$

In order to obtain the interpretation in (58b), according to assumptions that have been adoped so far, Neg would have to appear above IP at LF; in (57), this would happen as a result of Neg raising to I at S-structure, and then the complex head [Neg-I] raising to C at LF. If Neg is uniform in its behavior, the quantifier scope data are thus problematic whether Neg raises

with I to C at LF or not. If it does, then (55a) is unaccounted for; if it doesn't, then one interpretation of (57) is unaccounted for. The problem remains under other standard theories of quantifier scope interactions with Neg. Lacking an adequate account of scope interactions that captures the correct interpretations of both (55) and (57), the quantifier scope interactions with Neg are pretty inconclusive regarding the behavior of Neg.

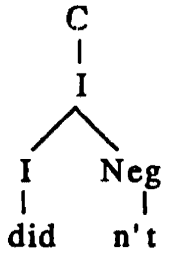
But if we are to suppose that Neg induces Minimality effects, interfering with antecedent government, then there is evidence that Neg does indeed raise to C at LF. Note that A movement occurs freely over Neg in raising constructions and the passive.

(59)
a. John$_i$ wasn't hired t_i
b. John$_i$ seems not [t_i to be tired]
c. John$_i$ doesn't seem [t_i to be tired]

Recall that A movement is local, requiring antecedent government between successive links in the chain. If we suppose that the head Neg interferes with antecedent government, then Neg would block antecedent government of t_i by *John$_i$* in (59) if Neg remained in place. However, if Neg raises with I to C at LF, then only its trace intervenes between t_i and *John$_i$* in (59). On these grounds, it will be assumed that Neg raises with I to C at LF, if it has not already done so by S-structure.

Returning to (55b), *Why didn't someone leave*, the structure of COMP in the LF of the interrogative is then the following.

(60)



In this configuration, I does not dominate Neg since not all segments of I dominate Neg (see Chomsky 1986b). We will assume that this configuration is one in which Neg c-commands I.[25] This makes it plausible to say that Neg in (60) makes I opaque for the transmission of verbal features to C.[26] Assuming this, the presence of Neg adjoined to I in C blocks the EGD(V-I) from extending to include the C-system. Therefore, an element in spec-CP will not be able to antecedent govern into IP when Neg is present within the INFL complex in C.

Now return to the inner island data in (54). In (54a,b), Neg adjoins to I and appears overtly with the I complex in C.[27] This blocks extension of the EGD(V-I) to the C-system, so the adverbial *wh* element in spec-CP does not antecedent govern its trace within IP. The same explanation holds for (54c). In (54d), the clause containing Neg does not have a [+wh] COMP; therefore, I does not raise to C at S-structure, so Neg does not appear in C on the surface. Nevertheless, we assume that I raises to C at LF in indicative clauses and tensed complement clauses, so we expect that Neg should occur within the I complex in C in the complement clause in (54d). The LF structure of this example is the following.

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[25]See Laka (1990) for the claim that when α is adjoined to β, α c-commands β.
[26]This was suggested to me by David Pesetsky. Likewise, the Neg-I complex could not lower to V since Neg would block the transmission of inflectional features from I to V.
[27]It is immaterial to this point, as it is to most other points in this dissertation, whether a verbal complex [V-I] raises to C, or whether I raises to C without V.

(61)
why$_i$ did John say [$_{CP}$ t_i' [$_C$ [$_I$ was Neg]$_k$ that] [$_{IP}$ Max t_k angry t_i]]

Since Neg occurs in the I complex in C of the complement clause, the EGD(V-I) of this clause does not extend to the C system, so t_i' does not antecedent govern t_i in (61). This accounts for (54d).

Other negative elements also induce inner islands. This is illustrated in (62).

(62)
a. * Why did nobody [leave ___]
b. * Why do few people [cross the river each day ___]
c. * Why did John never [call Mary up ___]

These follow from the discussion above if there is a head Neg in each of these examples. The presence of Neg in (62a,b), where there is a negative subject, might follow from requirements of spec-head agreement of the subject in spec-IP and the complex in I, to which Neg can adjoin if it is present. The presence of Neg in (62c), where there is a negative adverb *never*, might follow from the licensing conditions of negative adverbs. If different kinds of adverbial elements are licensed by specified heads, as argued in Travis (1988), then the presence of a Neg projection in (62c) would follow from the licensing requirements of the negative adverbial.

4.5. Subjacency

In Chomsky (1986a) and L&S (1990), subjacency is defined in terms of the system of barriers used to define the locality domains for antecedent government. In this section we investigate the prospect of defining

subjacency in terms of the system of government domains used here to define antecedent government.

Consider the following sentences.

(63)
a. Who$_i$ did you say Tom saw t_i
b. ? Who$_i$ do you wonder whether Tom saw t_i

Assuming that the *whether* complements have an empty C^0, with *whether* in spec-CP, the forms in (63) have the LF structures shown in (64), with EGDs indicated; adjunctions to VP are not pertinent to the present discussion and will be disregarded.[28]

(64)
a. [$_{CP}$ who$_i$ did [$_{IP}$ you say [$_{CP}$ t_i' [$_C$ I] [$_{IP}$ Tom saw t_i]]]]

---

b. [$_{CP}$ who$_i$ do [$_{IP}$ you wonder [$_{CP}$ whether [$_C$ I] [$_{IP}$ Tom saw t_i]]]]

In both examples, the EGDs of the higher and lower clauses overlap in the C system of the lower clause. These EGDs remain distinct, and do not fuse, since the complement clauses have independent [Tns] operators. The presence of subjacency effects in (64b), and their absence in (64a), suggest that when a moved element crosses the intersection of two EGDs, it must

[28]The domains indicated in (64) are actually the subtrees spanned by EGDs. As defined above, GDs and EGDs are not subtrees; see (19) and (20) above. So talk below of a movement being encompassed by, or contained within, an EGD is quite loose. It could be made precise by defining the subtree spanned by an EGD and the subtree spanned by nodes crossed by a movement, and defining containment of a movement within an EGD in terms of subgraphs. I will informally continue to talk of movements being encompassed by EGDs.

stop in it. Now consider the subjacency violation in (65), with the LF structure in (66), with EGDs indicated, this time distinguished by minuses and pluses.

(65) ? What do you believe the claim that John saw

(66) [CP what$_i$ do [IP you believe [NP the claim [CP t_i' [C [that]I]

[IP John saw t_i]]]]]
++++++++++

In this example, there is no overlap of EGDs at all. Successive cyclic movement of the *wh* element exits the lower EGD, stops at spec-CP in the gap between the two EGDs, and then enters the higher one. Putting this example together with the ones in (64), the subjacency violations in (64b) and (66) involve a movement which is not fully encompassed by any EGD, whereas in (64a), the movement to the lower COMP is entirely contained within the EGD of the lower clause, while the movement to the matrix COMP is entirely contained within the EGD of the matrix clause. This suggests the following formulation of subjacency.

(67) Subjacency: A movement violates subjacency when there is no EGD, D, such that the movement is entirely contained in the subtree spanned by D.

But consider the following.

(68) What$_i$ do you think that Tom saw

LF: [CP what$_i$ do [IP you think [CP t_i' [C [that]I] [IP Tom saw t_i]]]]
---------- ++++++++++

In this example, the subtrees spanned by the two EGDs are adjacent, but do not overlap. The movement from within IP to the lower COMP is not

contained in the subtree spanned by any one EGD. Thus this movement violates the formulation of subjacency in (67), showing this formulation to be incorrect as it stands. However, it turns out consistently, as in (68), that (67) captures subjacency in English if adjacency of EGDs is ignored in the following sense: suppose that for the purposes of computing subjacency, adjacent EGDs are fused into one; then (67), computed on the resultant configuration of EGDs, captures subjacency in English. For example, in (68), fusing the adjacent EGDs indicated by '-' and '+', the sentence becomes one big EGD for purposes of subjacency; therefore, the movement from the position of t_i to that of t_i' does not violate subjacency.[29] Of course, at this point, nothing would prevent movement from the position of t_i in (68) to the position of *what*$_i$. Thus, the conception of subjacency under consideration does not force successive cyclic movement. We will take this problem up below. In the meantime, we record the conception of subjacency under consideration in (69).

(69) Subjacency: A movement violates subjacency when there is no EGD, D, such that the movement is entirely contained in the subtree spanned by D, with EGDs computed up to adjacency (=fuse adjacent EGDs in evaluating this condition).

Somewhat more precisely, this says the following.

(70) Subjacency: Given a movement, there must exist an EGD, D, such that the spanning subtree of the movement is a subtree of the spanning subtree of D, with EGDs computed up to adjacency.

[29]When EGDs are adjacent, they don't fuse for purposes of antecedent government. Rather than saying that they fuse for subjacency, it is less misleading to say that the boundary between adjacent EGDs is simply ignored by subjacency.

This says that any movement must be spanned by a single EGD, modulo fusion of adjacent EGDs. This way of formulating the subjacency condition in English highlights its affinity to antecedent government, which, as formulated here, is a relationship spanned by a single EGD. However, in overlooking adjacency of EGDs, this formulation is implicitly more complex than it appears. Subjacency in English can alternatively be formulated as follows, where the complexity is overtly manifested as separate cases.

(71) Subjacency
- a. If a movement intersects the spanning trees of two disjoint (nonoverlapping) EGDs, D_1 and D_2, then the spanning trees of D_1 and D_2 are adjacent.
- b. If a movement crosses the intersection of two EGDs, then it must land in that intersection.

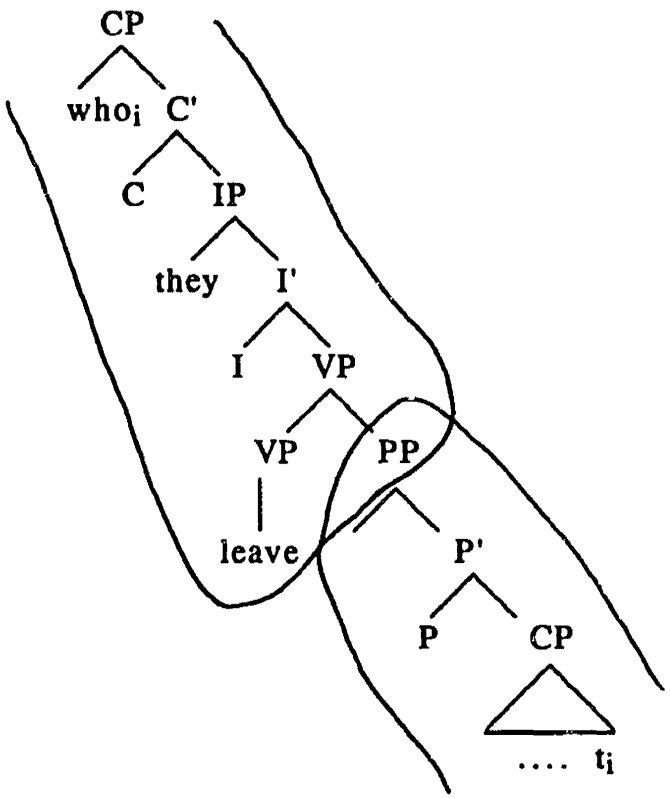
The formulations in (70) and (71) can be appealed to equivalently in all cases.

To take some further examples, this formulation captures Huang's (1982) CED effects as subjacency violations. The adjunct condition is illustrated in (72).

(72) ? Who did they leave before speaking to

LF: who$_i$ did they [$_{VP}$ [$_{VP}$ leave] [$_{PP}$ before [$_{CP}$ PRO speaking to t_i]]]

++++++++++



There is no EGD that encompasses the move from spec of the adjunct PP to the matrix COMP. This example critically relies on the the exact statement of the definition of government given in (18), repeated below in (73).

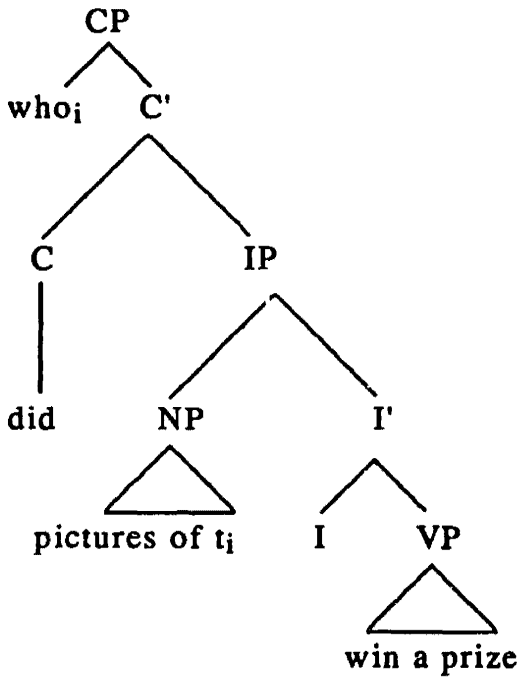
(73) α governs β iff
a. α and β are mutually m-commanding, or
b. α selects YP and β=YP or β is in spec-YP.

With the condition in (b) expressed as "α governs β", the spec-PP in (72) would be in the EGD of the matrix clause, and then (72) would not be a subjacency violation. Turning to the subject condition, we have the example in (74).

(74) ? who did pictures of win a prize

LF: [CP who$_i$ did [IP [NP pictures of t_i] win a prize]]

++++++++++++



In (74), the EGD of the clause includes the NP node of the complex subject, but not any other nodes of it. Thus there is no landing site for the extracted *wh* element in the intersection of the EGD of the clause and the GD of the head N of the subject, so the movement from within the subject NP to the matrix COMP violates subjacency.

Given this approach to subjacency, a natural account falls out of the following contrast, noted in Ross (1967), and discussed in Johnson (1985) and Coopmans and Stevenson (1991).

(75) a. He told me about a book which I can't decide whether to buy
b. ? He told me about a book which I can't decide whether I should read

As discussed in section 4.2 above, when an infinitival I substitutes into C^o, the EGD of V-I is not extended to the C system. Then the structures of the relative clause CPs (75a,b) are as shown in (76a,b).

(76)
a. [CP which$_i$ [IP I can't decide [CP whether C-I [IP PRO to buy t_i]]]]
---------- ++++++++++++

b. [CP which$_i$ [IP I can't decide [CP whether C-I [IP I should buy t_i]]]]

Thus (75b) involves a subjacency violation, but not (75a).

4.6. Wh-in-situ

The following contrast poses a problem for the account developed here.

(77)
a. * Who do you think that left
b. ? Who thinks that who left
c. ? Who wonders whether who left

The *that*-trace effect with S-structure movement, exhibited in (77a), was accounted for in sections 4.1 and 4.2 above in terms of the failure of the initial trace of the subject to be antecedent governed within an EGD. Assuming that the in-situ *wh who* in (77b) moves to the matrix COMP at LF, the LF structure obtained will be that in (78). (The structure in (78) is drawn up pending determination of the exact point to which the in-situ *wh* element moves.)

(78) $[_{CP}\ who_j\ who_i\ [_C\ I]\ [_{IP}\ t_i\ thinks\ [_{CP}\ t_j'\ [_C\ [that]I]\ [_{IP}\ t_j\ left\ ]]]]$

In this structure, just as with S-structure movement, the initial trace of the lower subject is not antecedent governed. Furthermore, adjunction to the lowest IP will not help since the EGD of the lower clause does not include the position adjoined to IP.

The conjecture that I wish to pursue is that in-situ *wh* phrases in English are D-linked, in the sense of Pesetsky (1987), when they are sufficiently distant from the matrix COMP (or the COMP that defines their scope at LF). In particular, a wh-in-situ phrase in English is interpreted by D-linking whenever it fails to be antecedent governed by the [+wh] COMP with which it is to be interpreted.[30] To begin, let's recall Pesetsky's argument for D-linking. Pesetsky argues that so called "pure superiority" cases such as those in (79) involve movement at LF violating the Nested Dependency Condition, in (80).

(79)
a. ?? $What_j$ did you persuade whom to read e_j
b. * Mary asked [$what_j$ [who read e_j]]
c. ?? Who_j did you give what to e_j

(80) NDC: If two *wh*-trace dependencies overlap, one must contain the other.

Compare (79) with (81), where no crossing of paths occurs upon LF movement of the in-situ *wh*.

[30]Any in-situ *wh* phrase can be D-linked in suitable settings. The discussion here concerns obligatory D-linking of in-situ *wh* phrases.

(81) a. Who$_i$ did you persuade e_i to read what
b. Mary asked [who$_i$ [e_i read what]]
c. What$_i$ did you give e_i to who

However, the pure superiority effects in (79) fail to show up for certain kinds of *wh* phrase, as shown in (82).

(82)
a. Which book$_j$ did you persuade which student to read e_j
b. Mary asked [which book$_j$ [which student read e_j]]
c. Which spy$_j$ did you give which document to e_j

Pesetsky explains this by suggesting that the *which* phrases in (82) do not move, but are construed through binding by the Q morpheme acting as an unselective binder.[31] The structure of the questions in (82) is shown in (83).

(83)
a. [$_{CP}$ $Q_{i,j}$ which book$_j$ [$_{IP}$ did you persuade which student$_i$ to read t_j]]
b. Mary asked [$_{CP}$ $Q_{i,j}$ which book$_j$ [which student$_i$ read t_j]]
c. [$_{CP}$ $Q_{i,j}$ which spy$_j$ [$_{IP}$ did you give which document$_i$ to t_j]]

The claim being advanced here is that any *wh*-in-situ in English which is not antecedent governed by the nearest [+wh] COMP with which it can be interpreted, is unselectively bound by the [+Q] morpheme (or [+wh] feature) of that COMP.

To see evidence for this, consider weak crossover (WCO) effects. In a sentence like (84a), when the position of *Bill* is questioned by overt movement, the result is degraded by WCO, as in (84b).

(84)
a. His$_i$ parents sent John$_i$ to school
John mentioned his$_i$ parents to Bill$_i$

[31]This draws upon ideas in Baker (1970) and Heim (1982).

b. ? Who$_i$ did his$_i$ parents send to school
? Who$_i$ did John mention his$_i$ parents to t_i

That WCO holds for LF movement is indicated by the fact that it emerges in quantifier raising.

(85) ? His$_i$ parents sent everyone$_i$ to school

In the literature, WCO is taken to be a characteristic of the sort of operator-variable chain established by movement; hence the manifestation of WCO is taken as a diagnostic of movement. Now, note that WCO effects are in evidence with the wh-in-situ in (86), indicating movement of the in-situ *wh* to COMP.

(86) ? Which journalist$_j$ mentioned his$_i$ parents to who$_i$

But when the in-situ *wh* is more deeply embedded, the WCO effects are not in evidence: the questions in (87) are perfectly grammatical.

(87)
a. Which journalist$_j$ believes that his$_i$ parents abandoned who$_i$
b. Which records$_j$ indicate that his$_i$ parents brought who$_i$ to Boston

This suggests that the more deeply embedded *wh* phrases in (87) do not move to the matrix COMP. However, these questions have "pair readings", just as (86) has; in (87a) suitable answers consist of pairs of journalists and people abandoned by their parents, and in (87b), of pairs of records and people brought to Boston by their parents. The lack of WCO in (87) indicates that these interpretations are not achieved by movement of the in-situ *wh* phrase. Nevertheless, the interpretation is obtainable if the in-situ-*wh* phrase is unselectively bound to the matrix COMP. The WCO effects in (86) indicate that this method of interpretation is not available to a *wh*

phrase such as *who* when it is closer to the COMP that defines its scope. It looks like the relevant locality relationship determining whether the D-linking option is available for the interpretation of an in-situ *wh* is antecedent government. The manifestation of WCO effects in (88), where the in-situ *wh* phrase *who*$_i$ is embedded but still antecedent governed by the matrix COMP, suggests that the relevant locality relation is antecedent government.

(88) ? Which journalist$_j$ believes his$_i$ parents to expect who$_i$ to succeed

Assuming that the relation in question is antecedent government, we record the conjecture at issue in (89).

(89) In English, an in-situ *wh* can be D-linked to a [+wh] COMP that does not antecedent govern it.

Return finally to (77b,c), repeated below as (90), with the LF of (90a) in (91).

(90)
a. ? Who thinks that who left
b. ? Who wonders whether who left

(91) [CP Q$_{i,j}$ who$_j$ [C I] [IP t$_i$ thinks [CP [C [that]I] [IP who$_i$ left]]]]

Since *who*$_i$ is not antecedent governed by Q, it follows by (89) that *who*$_i$ can be unselectively bound by Q. Thus the correct interpretation is obtained without inducing a *that*-trace violation by movement of *who*$_i$.

The following example, from L&S (forthcoming), further illustrates the point.

(92) who_1 wonders $what_2$ who_3 bought

As L&S note, this has an interpretation with the in-situ *wh* who_3 associated with the matrix COMP, but not with the lower COMP; thus the question can be asking for pairs of people such that the first wonders what the second bought, but it cannot be interpreted as asking for people who wondered about the buying habits of other people in terms of pairs of people and goods. Note that according to (89), who_3 can be D-linked to the matrix COMP, but not to the embedded COMP, yielding the correct result.[32]

Standard superiority violations, such as those in (93) below, are all monoclausal.

(93) What did who buy

These involve movement of the in-situ *wh* inducing violations of the Nested Dependency Condition in (80). If an in-situ *wh* element in English can be D-linked to any [+wh] COMP that does not antecedent govern it, as expressed in (89), it follows that these, as well as the pure superiority violations in (79), ought to improve with embedding, as in (94) and (95).

(94) $What_i$ did John say [that [who bought t_i]]

(95)
a. $What_i$ do you think that John persuaded whom to read e_i
b. Mary asked [$what_i$ [John thinks [that [who read e_i]]]]
c. Who_i do you think that John gave what to e_i

---

[32]There is, however, some question as to why (92) could not be derived by adjoining who_3 to the lower IP, and then moving it the the embedded COMP, yielding the interpretation that (92) in fact fails to have. Since I substitutes into C in the lower clause at LF, the trace adjoined to IP would antecedent govern the initial trace of who_3 and by assumptions advanced in section 3 above, the intermediate trace would not be subject to the ECP. It may be that a *wh* trace adjoined to IP would interfere with the extension of the EGD of the lower clause upon substitution of I into C. I have no better solution of this problem at this point.

They do seem to improve with embedding, but it is not clear that they improve to the full grammaticality expected under (89). Compare (94) and (95) with (96) and (97)

(96) What$_i$ did who say [that [John bought t_i]]

(97) a. What$_i$ do you think that who persuaded John to read t_i
b. Mary asked [what$_i$ [who thinks [that [John read t_i]]]]
c. Who$_i$ do you think that who gave what to t_i

The contrast does seem to be borne out, although it is subtle.

Cheng and Demirdash (1990) account for the difference between standard and pure superiority violations, in (93) versus (79), in terms of two components of the ECP, one applying at S-structure, and one at LF. The S-structure component is a requirement of antecedent government by an XP element, whereas the LF component is a requirement of proper head government; both requirements are formulated under conditions of relativized minimality. The standard superiority cases violate both components, and are hence strongly ungrammatical, whereas the pure superiority cases violate only the S-structure component, and are therefore less fully ungrammatical. On this account, the NDC can be dispensed with for the analysis of superiority phenomena in favor of this factorization of the ECP. Applied to (90), this account says that at LF, after the in-situ *wh* has moved to the the matrix COMP, the initial trace of this *wh* element fails to be properly head governed. The S-structure component of the ECP is satisfied, however, so only the mild ungrammaticality indicated in (90) results. However, is this account were correct, then the judgment in (90a)

should substantially change when the complementizer is absent: compare (98) to (99).

(98)
a. ? Who thinks that who left
b. ? Who thinks that who expects to win

(99)
a. ? Who thinks who left
b. ? Who thinks who expects to win

But the judgment in (99) is not substantially different from that in (98). Insofar as this is true, the lack of full grammaticality in (99) remains unaccounted for, shedding doubt on any account of (98) that does not account for (99) as well.

Chapter 5

Summary and Discussion

5.1 On the Semantic Content of Complementizers

The main claim to emerge from this dissertation is that the complementizer of a factive complement clause has semantic content, making it obligatory throughout a derivation, with a corresponding impact on antecedent government. On this basis we can identify the factive complementizer as a distinct class of complementizer. The distinguishing characteristic of a factive complementizer is that it discourse-binds the event variable of the factive clause. Since a factive predicate taking a tensed complement selects a complement of the form CP<> with no open event position, it follows that the factive complementizer is obligatory in the tensed complement of a factive verb since otherwise the event variable would not be discharged and the complement would be of the form CP<e>, violating the subcategorization requirements of the factive predicate.

The complementizer of a propositional complement plays no semantic role and is correspondingly subject to deletion, at S-structure or at LF. Along the way, it was noted that the complementizer *that* is obligatory in the complements of a few propositional verbs, such as *assert*, *conjecture*, and *propose*. It was conjectured that the complementizer plays a semantic role of some sort in the complements of these verbs, although this was not explored. The propositional verbs which require a complementizer might be distinguished as expressing some degree of manner, and this might condition the occurrence of the complementizer. If this were so, then these

exceptional propositional verbs could be assimilated to manner of speaking verbs such as *whisper* and *shout*, which also take an obligatory complementizer in their complements. The adjunct extraction pattern out of complements of *assert*, *conjecture*, and the like would then be expected to follow the extraction pattern out of manner of speaking complements, as seems to be the case in fact.

Furthermore, it was argued in previous chapters that the treatment of factive complements given there could be extended to the class of response stance complements, which are neither factive nor propositional, including complements of negative verbs such as *deny* and *doubt*, and complements of nonfactive, nonnegative verbs such as *agree* and *accept*. The response stance complements behave like factive complements with respect to adverbial *wh* extraction. Following Cattell (1978), it was suggested that response stance complements refer to material at issue in the discourse, and therefore that the event position of a response stance complement is formally discourse bound by the complementizer, as is the case in a factive complement. This assigned to the complementizer of a response stance complement a semantic function identical to that of the complementizer of a factive complement, which gave a uniform account of the properties of adverbial *wh* extraction out of factive and response stance complements.

Thus, following Cattell (1978), response stance complements were assimilated in behavior to factive complements, and a basic cut was made between propositional complements on the one hand and factive and response stance complements on the other. On the account developed here, propositional complementizers have no semantic function in English, by

virtue of which they are optional (except in complements of a few verbs such as *assert* and *conjecture*), whereas factive and response stance complementizers have the semantic function of discourse binding the event position of the complement clause. The verb classes could be drawn somewhat differently. In particular, the response stance complements, as identified here, include complements of negative verbs such as *deny* and *doubt*, and these might have independent reasons for patterning with factive complements as they do. This possibility will be explored later in this section in connection with some recent literature on negative verbs and the licensing of negative polarity items. Also, accepting that propositional complementizers play no semantic role in English, the question arises why propositional complementizers are obligatory in many other languages, as they are in many Romance languages. This issue will also be broached below in connection with some recent literature, but a full consideration of it is beyond the scope of this dissertation. Before turning to the literature, and to discussion of the questions and alternatives mentioned above, it might be useful to summarize the claims made so far in this dissertation concerning the event structure of tensed complements, and the semantic role of *that*-type complementizers in English.

Propositional complements

Verbs: allege, assert, assume, believe, claim, conclude, conjecture, consider, decide, declare, envisage, imagine, propose, report, say, state, suggest, suppose, suspect, tell, think

complementizer obligatory: except for *assert*, *conjecture*, *propose*

adverbial *wh* extraction free: except out of complements of *assert*, *conjecture*, *propose*

event structure:

believe [$_{CP<e>}$ (that) [$_{IP<e>}$ Bill drove to Boston]]
|_____↑

Mode of discharge of the event position: Quantified out in semantic composition with the higher verb. The propositional attitude verb induces quantification over events within the mental model of the subject.

Factive complements

Verbs: admit, comment, emphasize, forget, inform, know, mention, notice, point out, realize, recall, recognize, regret, remember

Complementizer obligatory.

Adverbial *wh* extraction not possible.

Event structure:

regret [$_{CP<>}$ that [$_{IP<e>}$ Bill drove to Boston]]
|_____↑

Mode of discharge of event position: discourse bound by the complementizer

Response Stance Complements

Verbs: (Negative) deny, doubt
(Nonnegative) accept, agree
(Factive response stance) confirm, verify

Complementizer obligatory. Event structure and adverbial *wh* extraction facts the same as for factive complements.

At a few points in recent literature, a semantic role for *that*-type complementizers has been claimed, or can be discerned. Two such instances will now be discussed in order to address some of the issues raised in the above paragraphs, and to reinforce the points that contentful *that*-type complementizers can be found and that they have fairly systematic effects on extraction which can be accounted for in a uniform way.

5.1.1 Negative Complementizers: Laka (1990)

Laka (1990) attributes a semantic role to the complementizers of complements of negative verbs like *deny* and *doubt*, based on the following considerations. Negative polarity items (NPIs) can occur in complements of negative verbs, as illustrated in (1).

(1) a. John denies that anybody poisoned the turkey
b. John doubts that Ingrid likes anyone
c. John doubts that Sam gives a damn

These verbs also take NP objects, as shown in (2).

(2) a. John denies the charge
b. John doubts that claim
c. John doubts the evidence for that claim

But NPIs do not occur as object of these verbs. When these verbs take an NP object like *anybody* or *anything*, the result is not grammatical with a negative polarity interpretation of *any*, but only marginally with a "free choice" interpretation of*any*, which improves the more the object is stressed.

(3) a. * The witnesses denied anything
b. * The attorney doubts any explanation

Laka provides solid evidence that the *any* NPs in (3) are instances of free choice *any*, insofar as they are acceptable at all, and that those in (2) are negative polarity *any*. The evidence includes the following: (I) inserting *just* before an NP with free choice *any*, as in (3), reinforces the free choice reading; inserting *just* before a negative polarity NP with *any* alters the

meaning, producing a free choice *any* interpretation. (II) Replacing the negative verb by a positive verb leaves the free choice *any* interpretation in (3), insofar as it is available, unchanged; doing so in (2) alters the meaning, producing a free choice *any* interpretation. (III) An indefinite description substituted for the free choice *any* in the context in (3) has an existential interpretation, as in (4) below; an indefinite description substituted for the negative polarity *any* in (2), with the results shown in (5), doesn't carry existential force.

(4) a. John denied a single charge
b. John doubts a single explanation

(5) a. John denied that a single person entered the room
b. John doubts that a single gold coin was missing

Laka argues from (3) that the negative verb does not license negative polarity items; thus in (2), where NPIs are licensed, the licenser must be something other than the matrix verb. Laka proposes and argues that the licenser of the NPIs in (2) is the complementizer of the complement clause. This accords with the proposal of Progovac (1988) that the internal structure of the complement CP be invoked to account for the licensing of the NPIs in (2). As Laka notes, taking the licenser to be the complementizer brings examples like (6) immediately into accord with the generalization that NPIs must be c-commanded by their licenser at S-structure;

(6) [that anybody left the room] was denied by the witnesses

the same point is made by the contrast between (7) and (8), which Laka attributes to David Pesetsky.

(7) What did nobody do?
a. * Buy any records
b. Buy records

(8) What did Bill deny?
a. That he had bought any records

The contrast in (7) indicates that the NPI licenser must be present in the answer to the question; this is the case in (8a) if the complementizer is the licenser.

If the complementizer is responsible for licensing NPIs in complements of verbs like *deny* and *doubt*, as Laka argues, then the complementizer is playing a semantic role; Laka thereby identifies a class of negative complementizers occurring in these contexts. Along the lines of the treatment of factive complements in previous chapters of this dissertation, we can ask whether the Principle of Full Interpretation would then require that negative complementizers be present at LF. We might be tempted to conclude that it wouldn't since NPIs seem to be grammatically licensed by c-command at S-structure. Thus, so far as grammatical licensing is concerned, relevant aspects of the structure might delete or be obscured at LF; in the case at hand, we might imagine that the negative complementizer deletes at LF, with no impact on grammatical licensing, which takes place at S-structure. But if the negative complementizer deletes at LF, then some record of its presence will nevertheless have to be kept in order to derive the negative polarity interpretation of NPIs that occurred in the context of the negative complementizer. Thus Full Interpretation can be violated only at the expense of introducing quite arbitrary, and otherwise unmotivated, mechanisms to record the presence of the negative complementizer. It is much more straightforward to suppose that the negative complementizer

remains throughout the derivation, serving to license NPIs at S-structure, and staying on at LF to induce the polarity sensitive interpretation of the NPI. The point is quite general: it is fully conceivable that a grammatical licensing condition might apply at S-structure, while the structure involved nevertheless remains critical at LF as the input to semantic interpretation.

We thus assume that negative complementizers are obligatory throughout a derivation. We then expect characteristic effects of the obligatory complementizer on adjunct extraction. These expectations are borne out, as indicated in (9).

(9) a. * Why does John deny [that Mary left the room ___]
b. * Why does John doubt [that Mary fired Bill ___]
c. * How much does John doubt [that Bill likes Mary ___]

Note that the same contexts were considered in previous chapters as response stance complements, as identified by Cattell (1978). The analysis of these as response stance, along the same lines as the analysis of factive complements in chapters 2 and 3 above, requires that the response stance complement involves discourse binding of the contents of the complement clause. Laka's proposal gives an alternative grounding for the claim that the complementizers of complements of negative verbs have semantic content; this assures that complements of negative verbs can be treated for extraction purposes as they were in previous chapters of this dissertation even if these complements are not response stance, or even if the treatment of response stance complements given here should be rejected. The account of the extraction facts proposed in chapter 4 above, based on obligatoriness of the complementizer, will be reviewed in section 5.2 below.

5.1.2 Indicative and Subjunctive Complements in Italian: Scorretti (1991)

Subjunctive tensed complements in Italian can have their complementizer dropped, but not indicative complements, as the following data from Scorretti (1991) illustrates.

(10) a. Credeva che / __ Mario avesse scritto (SUBjunctive)
He thought that / __ Mario had written

b. Sapeva che/ *__ Mario aveva già scritto (INDicative)
He knew that/ *__ Mario had already written

Furthermore, the subjunctive complement is tense dependent on the matrix tense, whereas the indicative complement is tense independent. Following Scorretti (1991), assume that this is due to the tense variable of a subjunctive complement being bound via an operator chain to the tense operator of the matrix. The facts in (10) suggest a role for the complementizer in this analysis which, departing from Scorretti, we can implement as follows. Suppose that in an indicative tensed complement, the overt complementizer *che* lexically supports an independent tense operator moved to C at LF. The complementizer then performs a semantic function, which makes it obligatory. The complementizer of a subjunctive complement doesn't support an independent tense operator, and therefore can delete. The postulated structures are shown in (11).

(11) a. pro [I Tns$_i$] credeva [CP [C [I Tns$_i$] (che)] [IP Mario avesse scritto]] (SUB)

b. pro [I Tns$_i$] sapeva [CP [C [I Tns$_j$] che] [IP Mario aveva già scritto]] (IND)

Given these structures, with the complementizer optional in (11a) and obligatory in (11b), we expect that adjunct extraction should be possible out of subjunctive complements, but not out of nonsubjunctive complements. This expectation is borne out. Adjunct extraction out of subjunctive complements is illustrated in (12).

(12) a. Perché$_i$ pensi [che Gianni sia partito __ $_i$]
why think-2nd that G. be(sub) left

b. Como$_i$ pensi [che abbia riparato la macchina __ $_i$ Gianni]
how think-2nd that have(sub) repaired the car G.

But adjunct *wh* elements cannot extract out of nonsubjunctive complements, even if these are nonfactive, as shown in (13).

(13) * Perchè aveva sentito/scritto [che Gianni era partito __ $_i$]
why did-3rd hear/write that G. has left

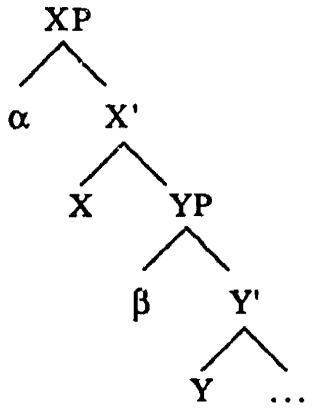
Implicating the complementizer in the support of an independent tense operator, we obtain the familiar situation: the presence of a complementizer with a semantic function is correlated with the failure of adjunct extraction out of the complement clause. The reasons for this given above in the present work will be reviewed in section 5.2.

5.2 Complementizers, Antecedent Government, and Minimality

The generalization that emerges from the cases of adverbial *wh* extraction considered above is that such extraction goes through out of a tensed complement whose complementizer plays no semantic role, and blocked out of a tensed complement whose complementizer has a semantic function. By the Principle of Full Interpretation, it follows that adverbial *wh* extraction is blocked out of a tensed complement just in case the complementizer is present at LF. In the approaches considered here, the extraction properties were tied directly to the presence of the complementizer. Furthermore, IP is stipulated to be a barrier unless L-marked, and the L-marking of IP is accomplished by movement of the [V-I] complex to C at LF.

It was observed that the complementizer effects in question are a sort of Minimality effect. A formulation of the definition of antecedent government was then developed which would directly block antecedent government over a complementizer, or any other nongoverning head, present at LF, thus capturing the Minimality effect. This approach proceeded on the assumption that INFL, or its component heads, are extended projections of V in a way that C isn't. On the basis of this assumption, the government domain of V extended automatically to all of IP, where the government domain of a head X, occurring in the configuration in (14), was defined as in (15).

(14)



(15) GD(X) = {α, YP, β, Y', Y}

If I is an extended projection of V, then the government domains of V and I are fused into an extended government domain (EGD). Antecedent government was defined as follows.

(16)
α antecedent governs β iff
a. α binds β (α c-commands β, and α and β are coindexed), and
b. There is an EGD containing both α and β.

The possibility of antecedent government across IP then depends on the configuration resulting from movement of [V-I] to C at LF. If the complementizer *that* is absent at LF, then [V-I] substitutes into C; in this case, the verbal features of V-I are transmitted to C, and so spec-CP becomes part of the the EGD(V-I), so a constituent in spec-CP can antecedent govern into IP. If the complementizer *that* is present at LF, then [V-I] adjoins to C, and in this case the verbal features of V-I are not transmitted to C, and the C system is not included in EGD(V-I), so a constituent in spec-CP does not antecedent govern into IP.

The extension of the government domain of V depends directly on the transmission of verbal features, which is assumed to be conditioned by the features of the head. The GD(V) extends automatically to the I-system since I (or its component heads) is an extended projection of V, and thus carries the categorial [+V] features of V. The head C does not carry [+V], but if [V-I] substitutes into C, then this feature can be transmitted directly to C. However, if a lexical complementizer is present in C, then it carries the feature [-V], which clashes with [+V]; the presence of the complementizer thereby blocks transmission of [+V] to C. Thus the effects of the complementizer for the extension of the EGD(V-I) to C seem to fall directly out of the notion of a government domain, together with assumptions about the [+V] specification of various heads. Further consideration of the effects of (16) in ECM and super raising constructions led to refinements concerning the configurations in which EGDs can be united. The condition that emerged from the discussion in Chapter 4 was that the EGDs of two clauses are united when they overlap and do not contain independent tense operators. When the EGDs of two tensed clauses overlap, they are not fused since the two tensed clauses contain tense operators that are independent of one another.

In the remainder of this section, the account of antecedent government and *wh* extraction given in Chapter 4 and summarized above will be compared with several frameworks for extraction theory developed in the literature. The framework of Chapter 4 will henceforth be referred to as the Government Domain (GD) framework.

5.2.1 Lasnik and Saito (1984, forthcoming)

In the framework of Lasnik and Saito, antecedent government is defined as follows.

(17)
α antecedent governs β iff
a. α binds β (α c-commands β, and α and β are coindexed), and
b. There is no γ (γ=CP or NP) such that α c-commands γ and γ dominates β, unless β is in spec-γ.

This definition is expressed in terms of more primitive notions of the theory, but in such a way that the notion of antecedent government cannot be said to be derived from any more primitive notion of the theory. In particular, antecedent government is not defined in terms of government, nor explicitly related to government within the context of the theory. In the account given in Chapter 4, on the other hand, the structural condition involved in antecedent government is that of the extended government domain (EGD), which is directly defined in terms of the core cases of government, and the sharing or transmission of verbal features.

Using the notion of a legitimate LF object derived from Chomsky (Class lectures, Fall 1990), the γ-assignment mechanisms of L&S were simplified to the extent that γ was reduced to a privative feature assigned only to the traces of moved arguments, and γ-assignment was taken to apply freely at S-structure or at LF.

The L&S framework and the GD framework differ crucially in their treatments of *that*-type complementizers. L&S allow the complementizer

that to delete or to be inserted at any level of derivation in any complement clause. As a result, the presence of *that* at LF cannot be any part of the account of why adverbial *wh* elements cannot extract out of factive or response stance complements. Within the L&S framework, some other provision would have to be made to block these extractions. Possibilities include postulating a factive operator in spec-CP of a factive complement, as in Melvold (1986), or assuming that factive verbs don't L-mark their complement CP.

5.2.2 Chomsky's *Barriers*

The *Barriers* framework is similar to the GD theory in that antecedent government is effectively reduced to government in both, although quite differently in the two frameworks. In *Barriers*, the defectiveness of the I-system, according to which IP is not a barrier, makes the presence or absence of a complementizer have no effect on extraction. As a result, the possibility of adverbial *wh* extraction out of tensed complements does not depend in the *Barriers* framework on the presence of the complementizer. In the GD framework, antecedent government does not automatically extend across IP, and whether it does so or not depends crucially on the presence or absence of the complementizer at LF. The IP node is simply the upper boundary of that part of the EGD(V-I) that is given purely on the basis of the categorial features of the heads involved, without movement or transmission of verbal features to a head that lacks them underlyingly. Whether the EGD(V-I) can be extended to the C-system depends on whether or not a semantically contentful complementizer occupies C^o. The

possibilities of adverbial *wh* extraction are therefore tied to the presence or absence of a semantically contentful complementizer in C.

As with L&S, the import of these differences is that the extraction facts out of factive and response stance complements would be captured within the *Barriers* framework by positing a factive operator, not readily extendable to response stance complements, or by making assumptions about the capacity of factive verbs to L-mark their complement CPs. Cinque (1990) presents the latter option explicitly; see Chapter 3 above and section 5.2.3 below for discussion of this approach. Within the GD framework, the adverbial *wh* extraction facts out of all tensed complements follows on the basis of the theory of the semantic role (or lack thereof) of the complementizer.

5.2.3 Cinque (1990)

Cinque (1990) develops a post-*Barriers* extraction framework incorporating a number of elements from Rizzi (1990), and a number of original elements as well. The locality condition for adverbial *wh* traces and argument traces are explicitly separated within this framework. The locality condition for adverbial *wh* extraction is the following [p.42].

(18) *Definition of barrier for government*
Every maximal projection that fails to be *directly selected* by a category nondistinct from [+V] is a barrier for government.

The complementizer system is assumed to share in the feature [+V], as set forth in the following passage.

> Finally, concerning the [+V] requirement, it can be noted that I and C, if not intrinsically [+V] categories, are at least compatible with [+V] elements (witness their ability to host verbs in some languages). Thus, they can be taken to be (at least) nondistinct from [+V] categories. [p.41]

Given that the complementizer is nondistinct from [+V], the barrierhood of IP is voided by the fact that C selects IP.

The conceptual problems with this are that it is not clear that complementizers should be regarded as categorially nondistinct from [+V], and still less clear that they should be regarded as selecting IP. To begin with the first point, INFL, or some core subset of its components, seems to accompany any clausal instance of VP, whereas the projection of the C-system depends on the nature of the clause. Even infinitival clauses have a projection of INFL, although agreement features (or Agr heads) may be missing or null, and the Tense operator may be unspecified for [±past]. However, on most theories of infinitival structure, not all infinitives have a CP node. Furthermore, whereas INFL (T or Agr) seems to be critically related to V across languages, the association of C with V is limited to a fraction of languages in which C seems to host verbal elements; this is a phenomenon worthy of investigation, and may indicate that C is involved with I and V in these languages in a way that it isn't in other languages, but given their comparative lack of universality in contrast to INFL-V interactions, such phenomena do not seem to justify the general categorization of complementizers as [+V] in the same way that INFL-V interactions justify the general categorization of INFL as [+V]. In the above chapters of the present work, it was suggested that some complementizers play a semantic role. This leaves an open question as to why a CP node is present, as in propositional complements, when there is

no semantically contentful complementizer in C^0. But if it is right that (some) complementizers have a semantic function, then this function can be examined to see whether it would provide a basis for the categorization of complementizers as [+V], or whether, on the contrary, it suggests that complementizers should be wholly distinct from the verbal system. Insofar as complementizers have been identified here as having semantic content, inducing a presupposition that the contents of the complement clause actually occurred in a factive complement, or are at issue in the discourse in a response stance complement, their content would seem to identify complementizers along more traditional lines as markers of assertoric force rather than as verbal elements.

Concerning the second point, namely Cinque's assumption that C selects IP, it is not clear within standard theory why a *that*-type complementizer is required at all. It does not appear that the complementizer is a predicate that semantically selects IP as an argument. If this is correct, then C does not select IP under standard conceptions of selection.[1] Nevertheless, as Cinque notes [p.41], "C cannot take any complement other than IP." The question is whether this is due to any sort of selectional property of C, or some other sort of property. Within standard theory, since the function of the complementizer is not clear, it is unclear as well why the complementizer should regularly occur in the structural relation it has to IP, that is, in Cinque's words, it is unclear why

[1]To quote Grmishaw (1979): "Subcategorization expresses restrictions between predicates and the syntactic category of their complements. Semantic selection expresses restrictions between predicates and the semantic type of their complements." Thus if complementizer is not a predicate that takes IP as an argument, then C does not semantically select IP or subcategorize IP. In the terms of Pesetsky (1979), capturing the same distinction just quoted from Grimshaw, the complementizer does not c(ategory)-select IP or s(emantically)-select IP.

"C cannot take any complement other than IP." We can imagine that the binary branch between C and IP might be stipulated within X'-theory. But this gets away from the conception of X'-theory as a mere schema, that in (19), from Chomsky (1986b), where, in a tradition dating back to Stowell (1981), further properties of phrase structure are determined by predicate and argument relations, thematic properties of heads, case requirements, and so on.

(19) a. XP → YP X'
b. X' → X ZP

But while standard theory leaves the exact relationship between C and IP unclear, and thus leave it unclear whether this relation is one of selection, the theory of the semantic content of some complementizers given here suggests a specification of the relationship between C and IP. Recall from Chapter 2 above that propositional predicates select tensed complements of the form CP<e>, with a free event variable, whereas factive verbs select a tensed complement of the form CP<>, with no free event variable. On this theory, the complementizer mediates between a clausal complement taking verb, with its selectional requirements on the event structure of the complement, and the actual event structure of the complement clause. In paticular, in a factive complement, the complementizer *that* discharges the event position at IP, producing a CP<> complement appropriate for the higher, factive, predicate. On this account, the semantics of factive complementation require the complementizer *that* to occur in C^{o} of the complement clause. So in factive complementation, the complementizer has a semantic function by virtue of which its presence is required, and in the context of this function, the complementizer stands in a semantic relation to

IP. However, this relation is not one of selection. The factive complementizer does not select IP, but it is required in order to discharge the event position of the complement clause at the IP node.

Thus, in some cases at least, the semantic relationship of the complementizer *that* to IP can be specified as nonselectional. Since the semantic relation of *that*-type complementizers to IP is elsewhere (in propositional complements) obscure, if nonexistent, there seem to be no good grounds for asserting that C selects IP in general.

In assuming that C selects IP, and that C is nondistinct from [+V], Cinque assures, from his definition of barriers for government given in (18) above, that antecedent government will occur freely over *that*-type complementizers. This precludes appeal to the obligatoriness of the complementizer in the explanation of the extraction facts from factive complements. In fact, as discussed in Chapter 3 above, Cinque argues that factive complements are not directly selected by the verb, specifically, that they are θ-marked but not L-marked by the factive verb. This argument was found to be questionable, resting on a faulty assimilation of factive complements to manner of speaking complements; see section 3.1.2 above.

5.2.4 Rizzi (1990)

In Rizzi's (1990) framework of Relativized Minimality, A movement, A' movement, and head movement are blocked respectively by an intervening A specifier, A' specifier, or head. Of greatest concern for issues discussed in this dissertation, A' movement is blocked by an

intervening A' specifier. In particular, as has been noted in the literature (see Frampton 1990c), if this is to be the account of the failure of adverbial *wh* extraction over negative elements (the "inner islands" of Ross 1967), as Rizzi claims, then each inner island context must involve an intervening A' operator situated in an intervening A' specifier. The range of cases involved includes the following, from Frampton (1990c).

(20)
a. * I know how passionately she does not like soccer
b. * I know how passionately she never/seldom/rarely likes soccer
c. * I know how passionately few people like soccer these days

In order to account for the inner island of sentential negation in (20a), Rizzi assumes that Neg is an A'-operator in spec-IP. In this position, Rizzi claims, Neg blocks adverbial *wh* extraction by Relativized Minimality. Furthermore, Rizzi claims that Neg in spec-IP induces *do* support in English examples like the following.

(21) a. John does not smoke
b. * John not smokes

The reason is that the V-I complex formed by lowering of the inflectional affix at S-structure (see Pollock 1989 and Chomsky 1989) produces, on Rizzi's account, an A' operator which must raise at LF to a position governing the trace of the lowered inflectional head. As an A' operator, the V-I complex would be subject to Relativized Minimality effects by the A' operator Neg in spec-IP. Therefore V-I cannot raise, and so the affix lowering derivation is blocked. Instead, the inflectional affix can be realized on the verb *do*, inserted in I for this purpose, yielding (21a). Note that Chomsky's (1989) assumption that the V-I complex raises to I at LF would not do for Rizzi since this would not involve raising V-I over Neg

situated in spec-IP. Rizzi's account requires that the V-I complex raise at LF to a position higher than spec-IP so that Relativized Minimality is violated.[2] Rizzi gives no reason for this. It might be thought to follow from the status of V-I as an operator, which would require it to raise to an A' specifier or an adjunction site above spec-IP. But then, as Frampton (1990c) notes, we are faced with the oddity of a complex head raising to an A' specifier or to an adjunction site.

In any event, in (20b,c), the negative operator must also be in an A' specifier to create an inner island; as Rizzi notes [fn.18, p.116], this is problematic since the negative adverb does not induce *do* support.

(22) a. John never arrived late
b. John seldom arrived late

But Rizzi notes that the negative adverb can appear in pre-INFL position, as in the following.

(23) a. John never has arrived late
b. John seldom has arrived late

This leads Rizzi to suggest that the negative adverb is in pre-INFL position in (22), in which case (if it is far enough pre-INFL) it will not induce *do* support. But as Frampton (1990c) notes, no reason has been given for why the negative adverb should not be able to appear in spec-IP, regardless of where else it can occur. And if the negative adverb can appear in spec-IP, then there ought to exist a derivation in which *do* support is called upon, yielding the following:

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[2]Spec-IP is occupied by Neg so V-I would presumably not be able to move into spec-IP, and so would have to raise above spec-IP.

(24) * John never did arrive late (* with unstressed *do*)

But such is not the case.

Frampton (1990c) suggest a modification of Rizzi's treatment of inner islands, assuming the Relativized Minimality framework, in which all negative phrases in (20) involve the presence of NegP together with a null negative operator generated in spec-NegP. This establishes negation as an A' operator for the application of Relativized Minimality, but in a uniform way, with the operator closely tied to the head Neg. The *do* support facts can be captured assuming that sentential negation is a lexical head Neg, accompanied by a null negative operator in spec-NegP, whereas the negative adverb is (or is accompanied by) a negative operator in spec-NegP, accompanied by a null head. Then the sentential negation would interfere with the head-to-head movement involved in raising V-I at LF, but the negative adverb wouldn't.[3]

On the GD account, sentential negation occupies a head Neg, and other forms of negation are accompanied by a null head Neg. It was assumed in Chapter 4 that Neg raises to I and that the Neg-I complex raises to C at LF. Since Neg has no verbal features, it was assumed that in the configuration [C [I I Neg] C] produced by raising Neg-I to C, Neg blocks the transmission of verbal feature to C. Therefore, the presence of Neg blocks the extension of the EGD(V-I) to the C-system, so adverbial *wh* extraction is blocked out of inner islands. Note that on this account, given the head

[3]For this to go through, the null head accompanying the negative adverb should not have any effect on head-to-head movement of V-I.

Neg, whether null or overt, which is assumed to be required whenever negation is present, there is no need to posit null negative operators.

The claim of greater uniformity for the GD system over Relativized Minimality becomes stronger when factive contexts are taken into consideration. The Relativized Minimality framework does not provide any treatment of factive contexts other than ones that have been rejected here. If there is a factive operator in spec-CP of a factive complement, then the failure of adverbial *wh* extraction out of factive complements would follow from Relativized Minimality, but, as noted in Chapter 3 above, the factive operator could not be present at S-structure, and so would have to be inserted at LF. Rizzi (1990) does not pursue this option, but falls back on the analysis of Kiparsky and Kiparsky (1971), that the factive complement is embedded within an NP. The GD account, in contrast, blocks adverbial *wh* extraction out of factive complements due to the effect of the factive complementizer, which blocks the extension of the EGD(V-I) within the factive complement to the C system of the complement clause. The treatment of factive islands is therefore parallel to that of inner islands: in both cases, a nongoverning head intervenes in the extension of the EGD(V-I) to C, thereby blocking antecedent government across C^0 and into IP.

Rizzi (1990) also presents a unique account of comp trace effects. Noting that agreement features surface on the complementizer in many languages, Rizzi assumes that Agr can be generated in comp. When Agr is generated in comp in the presence of a *wh* trace in spec-CP, then Agr acquires the index of that trace through spec-head agreement, and thereby agrees with the extracted constituent. The possibility of subject extraction

depends on Agr being generated in C° and meeting two requirements: (i) Agr in C° must properly head govern the initial trace of the subject in spec-IP; and (ii) Agr must agree with the subject through spec-head agreement with a trace of the subject in spec-CP. The presence of a complementizer in C° blocks the generation of Agr there and thus blocks subject extraction.

As noted by Frampton (1990c), the requirement that Agr in C° agree with the extracted subject makes the licensing condition on the subject trace not purely one of proper head government, but something much more akin to antecedent government by the trace in spec-CP. To the extent that this is true, explicit antecedent government accounts such as those of Lasnik & Saito and that presented here are perhaps more straightforward accounts of comp trace effects. Concerning the appearance of agreement features on complementizers, this would presumably follow from the raising of I, or the V-I complex, to C at LF, as assumed here. This was invoked in the discussion of West Flemish in Chapter 4, where the account of complementizer agreement was adopted from Law (1991).

5.3 Topics for Further Inquiry

The main claim of this dissertation is that factive and response stance complementizers have a semantic function which makes them obligatory at LF, by Chomsky's Principle of Full Interpretation, and that this determines the adverbial *wh* extraction facts out of factive and response stance complements. The complementizer of propositional complement clauses has no semantic function in English and therefore must delete at LF, allowing adverbial *wh* extraction out of propositional complements. One

question left open by this approach is why *that*-type complementizers are obligatory in propositional complements in many languages, including, for example, French, Spanish, and Italian. The facts of adverbial *wh* extraction out of deeply multiply embedded propositional complements in these languages, discussed in Chapter 3, shows that propositional complements are present at LF in these languages. Adhering to Full Interpretation, it follows that the propositional complementizer should play a semantic role at LF in such languages. The discussion of indicative complements in Italian in section 5.1.2 above, adapting ideas from Scorretti (1991), suggested a semantic function for the nondeletable propositional complementizers in Italian, those introducing tensed indicative clauses, namely that they provide lexical support for the independent tense operator of the indicative complement. Whether such a semantic role can be found for nondeletable propositional complementizers across all the various languages in which they are found is a topic for further inquiry. The same holds for the few nondeletable propositional complementizers in English, such as in complements of *assert*, *conjecture*, and *propose*. By Full Interpretation, the complementizer in complements of these verbs should have a semantic function that is not shared by complementizers in complements of other propositional verbs such as *think believe*, and *say*. The requisite delineation of differences in propositional complementation across different propositional complement taking verbs in English would seem to require a more detailed look at properties of these verbs than was undertaken here, and is another topic for further inquiry.

A more mysterious and fundamental open problem left by the present work is what licenses the projection of the C-system, and of the

complementizer when it occurs, in ordinary propositional complements in languages like English where the complementizer apparently performs no semantic function and is deletable at LF. As discussed in section 5.2.3 above, we would not want to stipulate the projection of the C-system in phrase structure rules since, in current theorizing, the phrase structure rules are a bare X' schema, with the categorial content of the actual constituents involved determined by selectional properties of heads. If the projection of the C-system is to fall out of selectional properties of heads, it would presumably be that the propositional verb selects a CP complement, more particularly, that the propositional verb selects C^0 as the head of its complement. This could be stipulated as a fact of c-selection. But this is quite unsatisfactory. Even where c-selection has been argued to be independent of s-selection (Grimshaw 1979, Pesetsky 1982, among others) this independence takes the form of categorial variability across a given semantic complement type, and semantic variability across a given categorial complement type; it does not take the form of syntactic categories being introduced without any semantic content. If we stipulate the c-selection of CP by a propositional V and the c-selection of IP by a propositional complementizer, this will constitute a departure from building up categorial structure from underlying lexical properties that are not purely categorial in nature. Finally, since predicate argument structure is not involved in the relation between C^0 and IP, their configuration would not be determined by s-selection.

For factive complements, the relationship between C^0 and IP is not one of semantic argument structure, so the sequence of heads V-C-I would not be determined by s-selection. However, the semantic complementizer does

play a semantic role, which provides a basis for determining the sequence V-C-I in factive complementation by c-selection. The problem with propositional complementation in English is that there is no comparable semantic role of the complementizer to provide a basis for c-selection of the heads involved. The question then arises: why is the C-system projected in propositional complements in English? This is left an open question by the present work.

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