NULL OPERATOR CONSTRUCTIONS

by

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B.A., University of Massachusetts/Boston
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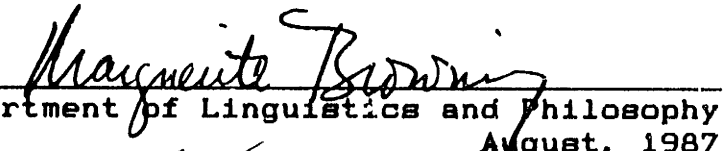
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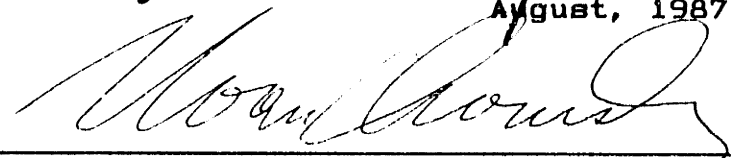
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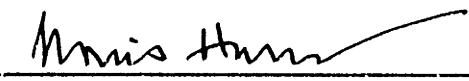
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NULL OPERATOR CONSTRUCTIONS

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Marguerite Browning

Submitted to the Department of Linguistics and Philosophy on August 14, 1987, in partial fulfillment of the requirements of the Degree of Doctor of Philosophy in Linguistics.

ABSTRACT

This dissertation defends the hypothesis that certain constructions involve covert A′-movement resulting in the creation of A′-chains headed by null categories commonly referred to as "null operators." The constructions which have been widely analyzed as involving null operators fall into two categories. In the first category, designated "OWM ("On WH-movement") constructions", are relative clauses (tensed and infinitival), purpose clauses, degree clauses, adjectival complements, clefts and comparatives, all of which are treated as covert wh-movement structures in Chomsky (1977). More recently, the null operator hypothesis has been extended to parasitic gap constructions, which constitute the second category. The goal of this dissertation is to develop an analysis of the nature of null operator chains and the conditions which apply to them which will account for the similarities and differences between the two categories of constructions in a unified manner. Three types of constraints are discussed and proposed: constraints governing the licensing of the null operator itself, the licensing of the variable created by null operator movement and the licensing of the null operator chain as a whole. Chapter one contains a history of the development of the null operator analysis, reviews the basic phenomena to be examined and sets out the framework, essentially that of Chomsky (1986a, 1986b), within which the research has been carried out.

Chapter two examines the relation between predication and the operators, both overt and null, which allow clausal categories to function as predicates in OWM constructions. It is proposed that predication relations which are not licensed by θ-role assignment must be licensed by the existence of an "agreement chain" between the subject of predication and a predicate internal category. An agreement chain exists when two categories are connected by an unbroken sequence of independently motivated instances of agreement, e.g. subject-predicate agreement, SPEC-HEAD agreement, etc. It is further argued that null operators are pure pronominals, i.e. pro, and that the agreement chain which licenses predication is sufficient to identify A′-pro.

Since A′-pro in OWM constructions receives phi-features via the agreement chain, it is licensed as the head of an A′-chain. In chapter three it is shown that the fundamental difference between OWM constructions and parasitic gap constructions is that A′-pro in the latter does not participate in an agreement chain and, therefore, does not receive phi-features. The result is that A′-pro in parasitic gap constructions is not licensed to head a chain; however, under the appropriate assumptions about the constraints governing A′-chains, unidentified A′-pro may act as an intermediate empty category. This position is embedded in an analysis of parasitic gap constructions which treats the parasitic chain and the "real" chain as a single "complex chain" derived by chain formation, a non-exceptional, non-construction specific process. The Subjacency Condition is interpreted as a condition on chain links which applies at SS to the output of all chain formation operations and which, therefore, governs the formation of complex chains. Conditions on the identification of variables are also shown to affect the distribution of parasitic gaps. At LF A′-pro in these constructions, like other intermediate empty categories in argument chains, deletes via Affect α, yielding representations identical to those resulting from the Chomsky (1982) analysis, in which the matrix operator directly binds two variables. The anti-c-command constraint is once again analyzed as a Binding Condition C violation. The chapter ends with some speculative remarks concerning the typology of empty categories and the nature of chains.

Other aspects of A′-chains involving both null and overt operators are explored in chapter four, in particular, the greater sensitivity of extracted subjects in a variety of contexts to the presence of intervening barriers. It is shown that this sensitivity is not a unified phenomenon and that it does not motivate certain revisions of the ECP which have been proposed in recent work. The marginality of subject gaps in OWM constructions, parasitic gap constructions and within certain types of islands in English is attributed to the Subjacency Condition, in a revised relativized form which imposes a stricter SS bounding constraint on non-complement chains than on complement chains. Another group of constructions which exhibit stronger violations and which share the property that extraction of an argument requires the obligatory presence of an intermediate empty category in an A′-position at LF, are brought within the scope of the ECP by means of a condition on LF argument chains involving A′-positions. A discussion of several other topics, including the appropriate formulation of the Minimality Condition, the nature of antecedent government and head government, the proper definition of "barrier", ends the chapter.

Thesis Supervisor: Noam Chomsky
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My deepest gratitude goes to my committee: Noam Chomsky, Richard Kayne, Wayne O'Neil and Esther Torrego. The opportunity to work closely with a group of such principled people has been a privilege and a gift. The impact of their work and teaching, especially that of Noam Chomsky, is (hopefully) apparent throughout this dissertation.

Several linguists have been important to the writing of this dissertation, even though I know them primarily (only, in some cases) through their articles; I gratefully acknowledge my intellectual debts to G. Cinque, R. Faraci, C. Jones, G. Longobardi, L. Rizzi, T. Stowell and E. Williams. My thanks also go to the following faculty members: to Morris Halle, for unfailing, though not always recognizable, support; to Jim Higginbotham for suggesting that I take a look at tough-constructions; and to Richard Larson for helpful challenges. Thanks also to the support staff in the department, especially Maggie Carracino and Nancy Peters.

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A Note to the Reader:

As is often the case, this dissertation will undergo significant revision before being informally distributed to the linguistics community. Please refer to the later revised version, available from the author, for the most developed statement of the analyses herein.

This thesis is dedicated to my family.

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CHAPTER ONE

INTRODUCTION

1.1 The Origin of Null Operators

A′-chains headed by empty categories first appear in Chomsky (1980; hereafter OB), where it is argued that, in certain constructions, base-generated PRO moves to COMP, creating an operator-variable chain analogous to that created by overt wh-operator movement. The impetus for positing the existence of empty category-headed A′-chains originates in the proposal in Chomsky (1973) that relative clauses such as (1) are derived by deletion of an overt wh-operator which has previously been moved to COMP, as shown in (2).

1) the person Bill saw

2) a. $[_{NP}$ the person $[_{S'}$ $[_{COMP}$ who] $[_{S}$ Bill saw]]]
   b. $[_{NP}$ the person $[_{S'}$ $[_{COMP}$] $[_{S}$ Bill saw]]]

Ross (1967) had pointed out that the rules forming infinitival relatives, purpose clauses, clefts, pseudoclefts, topicalizations and comparatives show the same island effects as wh-movement.[1] Chomsky (1977; hereafter OWM) develops this observation into the hypothesis that the characteristics associated with canonical wh-movement in questions are a diagnostic for

---

1. Chomsky (1973) discusses briefly the proposal (attributed to D. Vetter, fn. 32) that, since comparative deletion obeys the Complex NP Constraint, it should also be derived via wh-movement and deletion.

the occurrence of covert wh-movement (i.e. wh-movement + deletion of the overt operator) in a wide range of other contexts. The relevant characteristics of canonical wh-movement appear in (3) in the terminology associated with the OWM framework.

3) The rule of wh-movement has the following general characteristics:[2]

a. it leaves a gap
b. where there is a bridge, there is an apparent violation of subjacency, the Propositional Island Constraint (PIC) and the Specified Subject Condition (SSC)
c. it observes the Complex NP Constraint (CNPC)

---

2. The Subjacency Condition is defined in (i). The PIC is the Tensed S Condition of earlier work. (ii) combines the Specified Subject Condition (a), the Tensed S Condition (d) and the Subject Condition (b) with a special proviso (c) allowing for COMP-to-COMP movement. In (iii) "major category" means "maximal projection". All definitions are from Chomsky (1973).

i) The Subjacency Condition: a cyclic rule cannot move a phrase from position Y to position X (or conversely) in the structure

...X...[α...[ß...Y...]...]...X...

where α and ß are cyclic nodes, i.e. S', NP.

ii) No rule can involve X, Y (X superior to Y) in the structure

... X ... [$_{\alpha}$ ... Z ... -WYV ...] ...

where a) Z is the subject of WYV and is not controlled by a category containing X
b) α is a subject phrase properly containing MMC(Y) and Y is subjacent to X
or c) Y is in COMP and X is not in COMP
or d) Y is not in COMP and α is a tensed S.

iii) MMC(X) is the minimal major category dominating X (X itself, if X is a major category).

d. it observes wh-island constraints

The status of the statements in (3) will be discussed further below.

This hypothesis takes on great significance in light of the "bounded vs. unbounded transformations" debate, which was especially lively at that time (see especially Bresnan (1976, 1977); also, Ross (1967), Postal (1972)). Briefly, the two positions differed as follows: Chomsky proposed that the Subjacency Condition constrained movement transformations, thereby forcing movement to proceed in bounded increments.[3] The PIC and SSC applied both to movement transformations and "rules of construal", which governed coreference and anaphoric dependence[4], applying as conditions on representations whether the representations were base-generated or derived via movement.

The alternative position held that both deletion and movement transformations were unbounded, that is, variable terms could intervene between the constant terms of a structural description.[5] "Constraints on variables", i.e. condi-

---

3. Strictly speaking, the Subjacency Condition applied to only cyclic movement transformations: "a postcyclic rule such as the major case of French clitic movement (cf. Kayne (1975)) need not, on these assumptions, meet the condition of subjacency." (p.73)

4. Within the OWM framework these were the rules concerned with the assignment of the feature [±anaphoric to i] to some element in a structure containing NP_i, that is, the equivalent of the Chomsky (1981) Binding Conditions.

5. As an example, a version of the Relativization transformation is given below, with the structural description (SD) in (i) and the structural change (SC) in (ii). "rel" is a dummy relative marker deleted by the relativization transformation.

tions on the manner in which the structural description of a transformation could apply to a phrase marker, limited the power of transformations. As an example, consider the constraint in (4), which is proposed in Bresnan (1977). (See fn. 5 for relevant definitions.)

		NP	[$_s$'	COMP	X	rel	Y	]	
i)	SD:	1		2	3	4	5		=>
ii)	SC:	1		2	3	Ø	5		or
		1		4	3	Ø	5		

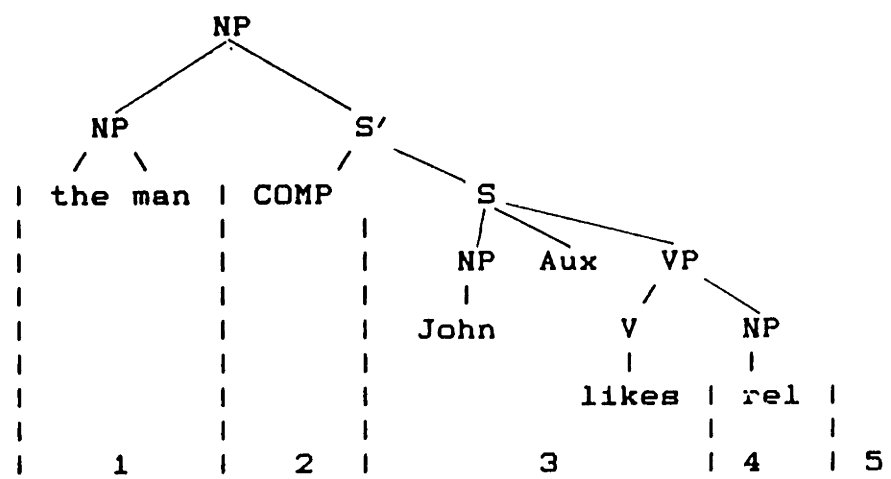
1, 2, and 4 are "constant terms" and 3 and 5 are "variable terms." Bresnan (1977) gives the following succinct definition of "proper analysis" in fn. 4:

iii) "A proper analysis of a structure s with respect to a transformation T is a factorization ($p_1,\ldots,p_n$) of s which satisfies the structural [description] of T and on which the transformational mapping (structural change) of T is defined."

A proper analysis of (iv) with respect to the Relativization transformation, which would give either the sentence in (v) or in (vi), is shown in (vii).

iv) the man COMP John liked rel
v) the man that John liked
vi) the man who John liked

vii)



4) The Complementizer Constraint on Variables: For any proper analysis (...,X,A,Y...) such that X and Y are variable factors and A is a constant factor to be deleted, if X = ...COMP, then .... must be empty (of terminals).

The generalization which (4) is intended to express is "that variable factors cannot split off complementizers from the clauses they mark and lump them together with arbitrary material" (p.173). This constraint rules out the factorization of (5a) shown in (5c), correctly predicting that (5b) will be ungrammatical. (Recall that "rel" is a dummy relative marker deleted by the relativization transformation.)

5) a. the woman COMP I think COMP rel will win the race
b. * the woman that I think that will win the race

c. the woman COMP I think COMP rel will win the race
| | | | | |
| 1 | 2 | 3 | 4 | 5

Notice that this approach does not imply that there is no movement or that there are no generalizable characteristics of movement; it argues instead that sensitivity to island constraints is not a diagnostic for movement.[6] This position received support if it could be shown that there are constructions which are demonstrably not derived by movement, but which nevertheless exhibit what are for Chomsky bounding effects.

---

6. See, for example, Bresnan (1977) where the failure of pied-piping in comparatives is argued to be an indication that wh-movement (which allows pied-piping) is not involved; that is, pied-piping is taken as a diagnostic for movement.

Although the question of whether transformations were bounded or unbounded was a central topic of this debate, there is a core distinction between the two approaches which has been somewhat neglected in the brief summary above. In Chomsky (1975) it had already been suggested that the terms of a structural description of a transformation be limited to the terms affected by the structural change and variables. The structural description of Passive could therefore only be as shown in (6b), not as in (6a).

6) a. (vbl, NP, Aux, V, NP, by, #, vbl)
   b. (vbl, NP, vbl, NP, vbl)

Adopting Emonds (1976) structure-preserving hypothesis allows the further reduction of (6b) to "Move NP", a transformation with only one constant term. This move represented a radical departure from construction-specific transformations, such as that in fn. 4, in the direction of a generalized transformation "Move α" constrained by general conditions. For a constraint on variables to have meaningful content, the structural descriptions of transformations must contain at least two constant terms, that is, no constraint on variables can be formulated to apply to a structural description of the form (vbl, α, vbl). The Subjacency Condition could be considered a constraint on the content of a variable in the structural description of a movement transformation so long as the transformation was formalized as in (6b). Once movement becomes "Move α" the Subjacency Condition must be regarded as a

constraint on the mapping from one level to another; the notion "constraint on variables" loses significance altogether within this new theoretical context. The importance of the OWM programme, to demonstrate that constructions which do not involve overt wh-operators but which exhibit bounding effects could be convincingly derived via covert wh-movement, becomes clear within the framework of this debate.

The increasing articulation of the theory of empty categories made possible the final step from movement of overt operator + deletion to null operator movement. In OB Chomsky proposes that the object in a purpose clause is base-generated as PRO, as shown in (7a).

7) a. John bought it $[_{s}{}'$ $[_{s}$ PRO_{i} to play with $PRO_{s}]$
b. $John_{j}$ bought it_{i} $[_{s}{}'$ PRO_{s} $[_{s}$ PRO_{i} to play with $t_{s}]$

PRO, even in COMP, was subject to the OB rule of Control ((95), p.33), which was constrained by the Opacity Condition ((27), p.13). In its DS position PRO_{s} is in an opaque domain and cannot receive an index; these considerations force the movement shown in (7b). Once in COMP, PRO_{s} will be accessible to the rule of Control and will be assigned the index of it by the Minimal Distance Principle (95), p.33). The position of null operators within a more current typology of empty categories will be discussed in chapters two and three.

1.2 Properties of OWM Constructions

1.2.1 The Status of (3)

Within the OWM framework (3c,d) derive from the SSC, PIC and the Subjacency Condition. It was shown in later work, that the SSC and, less straightforwardly, the PIC did not apply to the trace of wh-movement. Evidence that the SSC does not apply to variables comes from both Italian and English. ((8a) is from Rizzi (1978/82); (8b) is from OB.)

8) a. tuo fratello, a cui mi domando [che storie abbiano raccontato t, era molto preoccupato
'your brother, to whom I wonder [which stories they told t] was very troubled'
b. What$_i$ do you know how$_j$ [PRO to do t$_i$ t$_j$]

In both cases, grammatical wh-extraction takes places from within the domain of a subject. (Any marginality associated with (8b) is attributable to other factors.)

There is conflicting evidence as to the applicability of the Nominative Island Constraint (NIC), the OB reformulation of the PIC, to variables.[7] Freidin & Lasnik (1979) suggest that the ungrammaticality of sentences such as (9) indicates that the NIC does not apply to variables.

9) * who$_i$ did he$_i$ say [t$_i$' [t$_i$ knew John]]

---

7. In OB the NIC is defined as in (i); the case assignment condition in (ii) is a necessary concomitant of this reformulation of the PIC.

i) A nominative anaphor cannot be free in S'.
ii) The subject of a tensed clause is assigned nominative case.

If t_i were an anaphor subject to the NIC, then, since it is bound in S′ by t_i', the sentence would be grammatical. Freidin & Lasnik conclude that the ungrammaticality of (9) indicates that variables behave like names rather than anaphors. On the other hand, the far more serious ungrammaticality of (10b), as compared to that of (10a), suggests that the NIC does apply to variables.

10) a. ?? what$_i$ did John wonder how well$_j$ Bill did t_i t_j
b. * who did John wonder how well$_j$ t_i did his work t_j

In Chomsky (1981; hereafter LGB) these asymmetries and apparent contradictions motivate a major reorganization of the theory, with the following results, among others: (i) Binding Conditions A and C respectively account for the phenomena which formerly motivated the application of the SSC to anaphors and for the cases of apparent non-application of the NIC to variables, such as (9). (ii) The Empty Category Principle

11) [$_\alpha$ e] must be properly governed

is proposed to account for the phenomena which formerly motivated the application of the NIC to variables, i.e. (10).[8]

While there have been many developments in the theory since LGB, the basic outlines of the GB framework have

---

8. For discussion of this principle as it was first proposed see LGB, chapter 4 and chapter 5. A more recent formulation of the ECP and the notions government and proper government appears below.

remained more or less the same. Therefore, I will restate the properties in (3) in more current terms rather than as they would be stated within the LGB framework.

12) Wh-movement has the following general characteristics:

a. it leaves a gap
b. it obeys the Subjacency Condition[9]
c. the trace left by wh-movement is subject to the ECP and Binding Condition C

The Subjacency Condition, the ECP and Binding Condition C are defined as follows.

13) a. The Subjacency Condition: If (α_i, α_{i+1}) is a link of a chain, then α_{i+1} is 1-subjacent to α_i.
b. ß is n-subjacent to α iff there are fewer than n+1 barriers for ß that exclude α.[10]

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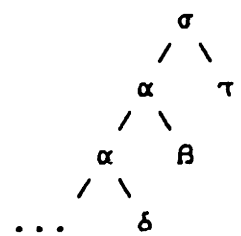
9. If Huang (1982) is correct then (12b) does not hold of LF Wh-movement. See Longobardi (forthcoming), Fukui (1987), and Pesetsky (1982) for arguments that the Subjacency Condition does apply to LF Wh-movement.

10. The following definitions are essentially those which appear in Barriers.

i) α **excludes** ß if no segment of α dominates ß.

In the structure in (ii), the category α (which is made up of the two segments α and α*) excludes τ, fails to exclude ß and includes δ.

ii)



iii) Where α is a lexical category, α **L-marks** ß iff ß agrees with the head of τ that is θ-governed by α.

iv) α **θ-governs** ß iff α is a zero-level category that θ-marks ß and α, ß are sisters.

14) The ECP: Non-pronominal empty categories must be properly governed at LF.[11]

15) Binding Condition C: An R-expression must be A-free (within the domain of the head of its maximal chain).

(13) and (14) are taken from Chomsky (1986b; hereafter Barriers) and (15) is from Chomsky (1986a; hereafter KoL).

Null operator constructions are still of great theoretical importance as given the controversy concerning the status

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v) τ is a **BC** for β iff τ is not L-marked and τ dominates β.

vi) τ is a **barrier** for β iff (a) or (b):
a) τ immediately dominates δ, δ a BC for β;
b) τ is a BC for β, $\tau \neq$ IP.

11. The Barriers adaptation of the Lasnik & Saito (1984) reformulation of the ECP is essentially as given below; some modifications have been made based on Chomsky (1986, class lectures).

i) α **governs** β iff α m-commands β and every barrier for β includes α.

ii) α **m-commands** β iff every category which fails to exclude α includes β.

iii) α **antecedent governs** β iff α is coindexed with β and α governs β.

The ECP consists of two parts: the assignment of a τ-feature as shown in (iv) and the LF filter in (v).

iv) t -> [+τ] when antecedent governed
t -> [-τ] otherwise

v) *t
[-τ]

The point in the derivation when τ-assignment occurs is extremely important, as is the ordering of Affect α and τ-assignment. Chomsky assumptions about these issues differ from those made by Lasnik & Saito in several ways; see chapter four for discussion.

of the Subjacency Condition (as a condition on movement vs. a condition on representation) and the status of the ECP (as a local vs. non-local condition on empty categories). Kayne (1981, 1983) subsumes some of the phenomena traditionally dealt with by the Subjacency Condition under a revised version of the ECP which is non-local, i.e. one which imposes conditions not only on the empty category but also on the structure or "path", in the graph-theoretic sense, which intervenes between the empty category and its antecedent. These path conditions apply to both movement and non-movement derived structures. Such an approach (adopted and expanded on by Cinque (1986a, 1986b), Longobardi (1984, 1986), Pesetsky (1982) and others) does not presuppose that there is no movement. However, by generalizing what are essentially bounding conditions so that they apply to non-movement representations, this approach removes an indirect argument for the existence of the movement transformation. With respect to this debate, the OWM constructions become once again significant, since they exhibit some of the characteristics of A′-movement derived constructions without the overt A′-operator.

1.2.2 Evidence for (3) and (12)

The constructions analyzed in OWM as involving wh-movement on the basis of the characteristics in (3) included comparatives, topicalizations, clefts, finite and infinitival indirect questions, finite and infinitival relatives, infini-

tival complements[12] of the degree specifiers too and enough, and infinitival complements of adjectives of the easy class.[13] In this and subsequent subsections I will review some of the data and arguments found in OWM and discuss their continuing validity given the reformulation of (3) as (12).

Finite relative clauses and indirect questions, the constructions which most closely resemble canonical wh-movement, receive little discussion in OWM. Data which illustrate the properties (3b,c,d) for relative clauses and indirect questions appear in (16) and (17). (18) - (23) illustrate that the properties in (3) hold of the other target constructions. ((18) - (23) are taken from OWM.)

Indirect Questions:

16) a. I wonder who Bill met t
b. I wonder who Mary thinks that Bill met t
c. * I wonder what Bill discussed the claim that John had mishandled t
d. * I wonder what Bill knew how John had fixed t

Tensed Relatives:

17) a. the man who Bill met t
b. the man who Mary thinks that Bill met t
c. * the case that Bill discussed the claim that John had mishandled t

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12. While Chomsky refers to the clauses associated to adjectival qualifiers such as too and enough as complements, it is not clear that they have the status of, for example, verbal complements. In particular, it is unlikely that too assigns a θ-role to the CP in (i).

i) John is too angry [$_{CP}$ to talk to]

13. Purposives are not discussed in OWM, though they are analyzed as involving movement in OB. Purposives do exhibit the characteristics in (3)/(12). See section 1.2.3 for discussion.

d. * the car that Bill knew how John had fixed t

Comparatives:

18) a. Mary isn't the same as [she was five years ago]
b. Mary isn't the same as [John believes [that Bill claimed [that she was five years ago]
c. * Mary isn't the same as [John believes [Bill's claim [that she was five years ago]
d. * Mary isn't the same as [I wonder [whether she was five years ago]

Topicalization:

19) a. this book, I really like t
b. this book I asked Bill to get his students to read t
c. * this book, I accept the argument that John should read t
d. * this book, I wonder who read t

Clefts:

20) a. it is this book that I really like t
b. it is this book that I asked Bill to get his students to read t
c. * it is this book that I accept the argument that John should read t
d. * it is this book that I wonder who read t

Infinitival Relatives:

21) a. I found a book for you to read t
b. I found a book for you to arrange for Mary to tell Bill to give t to Tom
c. * I found a book for you to insist on the principle that Tom should read t
d. * who did he find a book t to read t[14]

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14. In the discussion of infinitival relatives, adjectival qualifier complement clauses and <u>tough</u> complements, Chomsky gives examples which indicate that these constructions <u>create</u> wh-islands rather than examples which indicate that the presence of a wh-island within the construction results in ungrammaticality, cf. (17d), (18d), (19d) and (20d) in the text. Examples for (21), (22) and (23) which are comparable to the (d) examples in (17) - (19) are given below.

i) * a book to wonder whether to read t
ii) * the job was dangerous enough (for us) to wonder whether to offer t to John
iii) ? John is fun for us to find out how to annoy t

Degree Clauses:

22) a. John is tall enough for you to see t
b. John is tall enough for us to arrange for Bill to see t
c. * the job is important enough for us to insist on the principle that the committee should advertise t
d. * who$_j$ was the job$_i$ good enough for us to offer t$_i$ to t$_j$[14]

Easy Complements:

23) a. John is easy for us to please t
b. John is easy for us to convince Bill to do business with t
c. * John is easy for us to describe to Bill a plan to assassinate t
d. * what$_j$ is John$_i$ fun for us to give t$_j$ to t$_i$[14]

It is easy to see that the constructions under consideration do exhibit the properties characterized in (3).

Additional data are needed to determine whether these constructions have the properties in (12). The (d) examples in (16) - (23) indicate that the process by which these constructions are derived is subject to the Subjacency Condition. (24) illustrates what is a variant of this same point within the Barriers framework, namely, that these constructions obey the Subject Condition (Huang's (1982) CED). (25) indicates that the empty categories in these constructions are subject to the ECP.

24) a. * I wonder who Mary thought [friends of t] left

While (i) and (ii) are pretty seriously ungrammatical, (iii) seems to me to be less deviant. This might have to do with the generally weak (perhaps nonexistent) subjacency violation created by an infinitival how wh-island.

b. * the man who I think that [friends of t] left
c. * I interviewed more students than [friends of t] signed up
d. * John, I think that [pictures of t] will be on sale
e. * It was John that [pictures of t] were on sale
f. * a man (for us) to convince Mary that [pictures of t] should appear on the front page
g. * John is too well-liked for us to think that [friends of t] would betray him
h. * John would be difficult to convince Mary that [pictures of t] should appear on the front page

25) a. * I wonder who Mary thought that t left
b. * the man who I think that t left
c. * I interviewed more students than Bill said that t signed up
d. * John, I think that t left
e. * It was John that Bill thought that t left
f. * a man (for us) to convince Mary that t should get the job
(cf. ? man (for us) to convince Mary that she should hire t)
g. * John is too incompetent for us to convince Mary that t should get the job
h. * John would be difficult to convince Mary that t should get the job

The question of whether and how Binding Condition C is relevant to these constructions will be taken up in §3.3.

1.2.3 Purposives

Although purposives are not discussed in OWM, they exhibit the properties in (3)/(12) and appear in OB as the canonical example of "PRO movement", the original null operator hypothesis, as mentioned above. The following examples illustrate the existence of a gap (26a); the possibility of embedding (26b); the relevance of the subjacency condition

(26c), (26d) and, as a special case of this condition, the CED (26e); and the relevance of the ECP (26f).[15]

26) a. John bought Bill a new toy/it [Op [PRO to play with e]][16]
b. ? John bought it [Op [PRO to (try to) convince Bill to play with e]]
c. * John bought it [Op [PRO to devise a plan to play with e]]
d. ?? John bought it [Op [PRO to try to figure out [how to play with e]]]
e. * Mary brought him$_i$ in [Op$_i$ for [[friends of e] to give him a birthday present]]
f. * John brought him$_i$ in [Op$_i$ [PRO to convince Mary that e$_i$ should get the job]]

From now on any discussion of "OWM constructions" will be taken to refer to purposives as well.

1.2.4 Tensedness

The data in the preceding section offer convincing evidence in favor of the hypothesis that wh-movement occurs in all the OWM constructions. Nevertheless, there are points where the analogy between canonical wh-movement constructions and the OWM constructions breaks down. Chomsky discusses one such point in OWM having to do with the marginality of embedded finite clauses in infinitival indirect questions, infinitival relatives, degree clauses, and <u>easy</u> complements.

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15. For clarity, I will represent the trace of an overt A'-operator as t and the trace of a null operator as e.

16. In constructions where there might be confusion between an infinitival relative and a purpose clause, I will give both a full NP and a pronoun to help disambiguate the sentence in favor of the purposive reading.

27) a. ?? I wonder who to persuade Mary that I took t to the party
b. ? I found [a book for you to convince Bill that I wrote e]
c. ?* John is incompetent enough for Bill to think that we fired e for a good reason
d. ?? John is too arrogant for me to believe that Mary likes e
e. ?? John was easy for us to convince Bill that we liked e
f. ?* John bought this book/it for us to convince Mary that he wrote e

The judgements on the above sentences are my own. I found that while speakers vary widely in their assessment of these sentences, it is generally agreed that they do not exhibit the total grammaticality of wh-extraction from within tensed complements in direct questions, e.g. (28).

28) Who did you persuade Mary to tell John that we visited t

There are two possible explanations for the unexpected deviance of the sentences in (27): (i) wh-movement in the OWM constructions either possesses or lacks some property which differentiates it from canonical wh-movement or (ii) some other property of these constructions interacts with wh-movement to produce the ungrammaticality. Naturally, a third possible explanation exists: both (i) and (ii) may be true. I will leave this question unanswered for the moment since it calls for an investigation of the precise articulation of bounding theory and the idiosyncratic properties of the con-

structions in question, issues which will be taken up in detail in chapter four.'[7]

1.3 Parasitic Gaps

1.3.1 Extending the OWM Diagnostic

Many current accounts of parasitic gap constructions (e.g. Chomsky 1986a, hereafter, Barriers; Contreras 1984; Stowell 1985a and others) posit the existence of a null operator binding the so-called "parasitic" gap, as illustrated in (29). (I assume the standard judgement for parasitic gaps, namely, a mild marginality indicated by a single question mark.)

29) a. ? Which paper$_i$ did you read t$_i$ before [Op$_i$ [PRO filing e$_i$]]
b. ? an artist that [Op$_i$ close friends of e$_i$] admire t$_i$

In chapter three I will argue for a variant of the null operator hypothesis which holds that null operators in sentences such as those in (29) differ functionally from the operators in the constructions discussed in previous sections. The functional difference is that the null operator in parasitic gap constructions acts as an intermediate link in an A′-chain, while the null operator in OWM constructions heads a chain. This approach is developed and motivated in the next two chap-

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17. Given that the topic of this dissertation is null operator constructions and that indirect questions never appear with null operators (presumably for selectional reasons), I will hereafter exclude them from the discussion.

ters and I will not elaborate on it now. The point that is relevant for this introductory overview is that any version of the null operator hypothesis predicts that parasitic gap constructions will exhibit all the properties associated with the OWM constructions discussed in §1.2, in particular, the properties in (3)/(12). The following examples illustrate the possibility of embedding (30a); the relevance of the Subjacency Condition (30b), (30c) and, as a special case of this condition, the CED (30d); and the relevance of the ECP (30e).

30) a. which package did you measure t [before trying to wrap e]
b. * this is the man John interviewed t [before asking you which job to give to e][18]
c. * this is the man John interviewed t [before hearing about the plan you proposed to e]
d. * this is the candidate John hired t [because [close friends of e] threatened him
e. * who did you invite t [without believing [that t liked Mary]]

The data in (30) is consistent with the presence of a null operator in the "parasitic domain."

Depending on which sub-group of the OWM constructions parasitic gap constructions pattern with, we might also expect that they will decrease in grammaticality when the parasitic gap is embedded in a tensed clause.

31) ? which book did you review t [without even telling the author that you had read e]

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18. I will depart from the notational convention established in fn. 15 somewhat when dealing with parasitic gaps by using t for the "real" gap and e for the parasitic gap even when the real gap is derive by null operator movement, as in (30b).

The contrast between (31) and sentences such as (30a) seems to me to be minimal, perhaps not even as strong as the contrast between the sentences in (27) and their infinitival counterparts, but some speakers find it rather strong, so I will assume that the tensedness constraint applies to parasitic gap constructions as well.

1.3.2 Some Differences

There are two well-known properties[19] of parasitic gap constructions which the OWM constructions do not share:

32) Parasitic gaps --

a. are licensed only in the context of SS A′-movement
b. are ruled out if the "real" gap c-commands the parasitic gap at SS

Data illustrating the first property appear in (33); the second property, which has been called the "anti-c-command" constraint, is illustrated in (34).

33) a. * Mary filed every paper$_i$ without reading e$_i$
b. * Who filed which paper$_i$ without reading e$_i$

34) * Which paper$_i$ t$_i$ fell off the desk before John read e$_i$

It is obvious from the data presented in previous sections that (32a) does not hold of the OWM constructions; the grammatical sentences in (17) - (23) do not involve A′-movement other than the movement of the operator native to the con-

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19. These properties were originally noted by Taraldsen (1979); see also, Engdahl (1981a, 1981b) and Chomsky (1982).

struction. To see that the presence of a coindexed NP in a c-commanding A-position does not affect the grammaticality of OWM constructions, it is necessary to examine the (a) examples of (17) - (23) and (26), repeated below as (35).

35) a. the man who/that Bill met e
b. Mary isn't the same as she was five years ago
c. this book, I really like e
d. it is this book that I really like e
e. I found a book for you to read e
f. John is tall enough for you to see e
g. John is easy for us to please e
h. John bought a new toy to play with e

In (35a,b,c,e) the NP which is coindexed with the gap is not in an A-position; the examples are, therefore, irrelevant to the discussion. However, the NPs coindexed with the gaps in (35f,g,h) are in A-positions. Therefore, if the anti-c-command constraint applied to OWM constructions, we would expect (35f,g,h) to be as ungrammatical as (34). As illustrated by the grammaticality of (36), we can also rule out the possibility that OWM constructions do not exhibit anti-c-command effects because these effects are somehow crucially linked to matrix wh-movement.

36) a. Which professor$_i$ t_i is easy to talk to e_i
b. Who$_i$ t_i is too angry to talk to e_i
c. Which toys$_i$ did you give the kids t_i to play with e_i

It could be argued that the anti-c-command effect is obviated in (35f,g,h) and (36) by extraposing the infinitival clause containing the gap outside the c-command domain of the coindexed NP in an A-position. Evidence that the clauses in these

constructions are not extraposed outside the domain of the coindexed NP is found in (36).

37) a. * He$_i$ is easy to convince John$_i$'s friends to visit e$_i$
b. * He$_i$ is too drunk PRO$_{arb}$ to give John$_i$ the keys
c. * Mary gave the toy to him$_i$ [to play with e while John$_i$ was in school]
d. ?? We interviewed him$_i$ before we hired John$_i$

For many speakers, the violations in (36a,b,c) are significantly worse than that in (36d), indicating that the coindexed NP c-commands, rather than "weakly c-commands" the clause containing the gap.[20]

Not only do the sentences in (36) fail to exhibit anti-c-command effects, SS movement of the matrix antecedent of the null operator does not even result in the customary mild marginality associated with parasitic gap constructions. The grammaticality difference between (29) and (36) cannot simply be attributed to varying degrees of complexity as both, by hypothesis, contain the same number of gaps and operators in virtually the same configuration. This, then, is another point of dissimilarity between parasitic gaps and OWM constructions: in their canonical forms the latter are fully grammatical, while the former are somewhat marginal.

To summarize briefly: in addition to accounting for the shared properties of null operator constructions any analysis

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20. See Contreras (1984), and Hudson (1984) for arguments that c-command holds in sentences such as (29a) and Barriers for the proposal that it holds only "weakly."

of parasitic gap constructions based on the null operator hypothesis must answer the following questions:

38) a. What is the anti-c-command constraint and why does it affect only parasitic gap constructions?
b. Why do parasitic gaps require an SS A′-antecedent while the gaps in OWM constructions do not?
c. Why are canonical parasitic gap constructions marginal while canonical OWM constructions are not?

These questions, and others which will arise during the examination of particular constructions and theoretical issues, motivate the inquiry into the nature of null operator constructions which appears in the chapters to come. Before beginning the investigation proper, I will discuss briefly some null operators which differ from those we have seen thus far.

1.4 Null Operators and PRO$_{arb}$

In recent work several authors have proposed analyses involving null operators which do not resemble overt wh-operators as straightforwardly as those previously discussed. In this section I will review proposals made by Epstein (1984), Lebeaux (1984) and Borer (1986), which involve null operators that determine various properties of PRO$_{arb}$ interpretation. All three authors bring to light interesting aspects of arbitrary null subjects and, in the case of Lebeaux and Borer, their proposals are embedded in more comprehensive analyses of control phenomena. My argument in the remaining sections of this chapter is not that, a priori, null operators should not

play a role in an account of PRO$_{arb}$, but that the null operator accounts of PRO$_{arb}$ which have been proposed fail to provide interesting alternatives to default arb assignment and complicate the "theory" of null operators to an extent which is not justified by the explanatory gains of the analyses.

1.4.1 Benefactive Null Operators

Epstein (1984) argues that PRO$_{arb}$ in English is, at LF, a variable bound by a universal quantifier. His argument turns on the interpretation assigned to the sentence in (39).

39) it is fun [PRO to play baseball]

He points out that (39) has the interpretation in (40b), rather than that in (40a), a surprising fact if the LF and SS representations of (39) are isomorphic.

40) a. it is fun [(∀x) [x to play baseball]]
b. (∀x) [it is fun [x to play baseball]]

(40a) may be paraphrased as "if everyone plays baseball, it is fun," which is not equivalent in meaning to (39). While (39) seems to indicate that the subject of the complement clause takes scope over the predicate, (41) shows that this scope may not be extended any further.

41) a. Josh said it is fun to play baseball.
b. Josh said [(∀x) [it is fun [x to play baseball]]]
c. (∀x) [Josh said [it is fun [x to play baseball]]]

The interpretation of (41a) corresponds to the representation in (41b) rather than in (41c). Epstein rejects one possible approach, namely, that PRO... is a quantifier which is subject to a marked (i.e. non-clause-bound) form of QR, and offers instead an analysis which takes into account the actual argument structure of easy predicates. His proposal is that the benefactive argument of these predicates (whether adjectival or nominal) is an obligatory argument subject to the Projection Principle, i.e., structurally represented at every level. Familiar sentences such as (42) show that this argument may be lexically, and therefore structurally, represented.

42) It is easy for the rich for the poor to do the hard work.

Epstein argues that the argument must be structurally represented even when it is not lexically represented.[21] He goes on to argue that the base-generated empty category in this argument position at SS is pro, which receives universal quantifier interpretation only when it is antecedentless and which controls the PRO subject of the complement clause.[22] The scope

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21. For analyses of these constructions within earlier frameworks, see Grinder (1970, 1971), Kimball (1971), Lasnik & Fiengo (1974), and LGB, among others.

22. Epstein suggests (fn. 8) that pro in these constructions is licensed by benefactive θ-role assignment, possibly the only means of licensing pro in English. See Epstein (1984) fn. 8 and Epstein (1983) for discussion of some problems that arise for this analysis.

of pro is given by unmarked, clause-bounded application of QR.[23]

This approach allows two different representations for (43a), namely, those in (43b) and (43c).

43) a. it's fun for everyone to join in the game
b. it's fun for everyone [PRO to join in the game]
c. it's fun pro [for everyone to join in the game]

As we would expect the two representations correspond to two different interpretations. (43b) means something like (40b), which is expected given the assumption that the benefactive argument controls the complement subject. (43c) may also mean (40b); this would presumably correspond to "accidental" coindexation of pro and everyone. However, (43c) may also mean something like (44), where X, Y are (possibly overlapping) sets.

44) (∀x:x ∈ X) [it is fun for x (∀y:y ∈ Y) [y to join in the game]]

A rougher, but perhaps more cogent, paraphrase of (44) is "for everyone (the spectators and the team), it is fun for everyone (on the team) to join in the game." In this case, pro and everyone are not coindexed. Note that the sets X, Y may be coextensive, but even in this case the relation between the variables x and y is not one of control or variable binding.

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23. As Epstein notes in fn. 5, this approach predicts that arbitrary PRO will only be possible in contexts where there exists an "implicit" argument, i.e. quantificational pro, to act as a controller for PRO$_{arb}$. This leaves the sentences in (73) below unaccounted for.

An alternative analysis of the PRO$_{arb}$ scope facts discussed by Epstein derives from Rizzi's (1986) analysis of null objects in Italian and English. Rizzi explores the possibility that null object sentences such as (45b) are instances of universal quantification which, by analogy with the "roughly synonymous" (45a), have a logical representation of approximately the form shown in (45c). ((45)=Rizzi's (33))

45) a. Questa decisione rende [tutti felici]
'This decision makes [everyone happy]'
b. Questa decisione rende [___ felici]
'This decision makes [___ happy]'
c. For all x, this decision makes [x happy]

Rizzi shows, however, that the scopal properties of overt quantifiers, like <u>tutti</u>, and the alleged null quantifier of (45b) diverge in certain contexts. In particular, overt quantifiers in the subject position of small clauses may not take scope over matrix negation. Consider the sentences in (46), Rizzi's (34) and (35a).

46) a. Questa decisione non rende [molti cittadini felici]
'This decision doesn't make [many citizens happy]'
b. Questa decisione non rende [solo Gianni felice]
'This decision doesn't make [only Gianni happy]'
c. Questa decisione non rende [tutti felici]
'This decision doesn't make [everyone happy]'

According to Rizzi, the only interpretations available for these sentences are those in which negation takes scope over the quantifier. That is, (46c) corresponds to (47a) rather than (47b).

47) a. it is not the case that (∀x) this decision makes x happy
b. (∀x) this decision does not make x happy

In contrast, null subjects of small clauses take scope over matrix negation; the interpretation of (48) corresponds to (47b), rather than (47a).

48) Questa decisione non rende [___ felici]

Rizzi suggests that these empty categories are analogous to generic NPs rather than lexical quantifiers, since generic NPs also take scope over matrix negation; that is, (49a) corresponds to (49c), not (49b).

49) a. Questa decisione non rende [la gente felice]
'This decision doesn't make [people happy]'
b. it is not the case that this decision makes people happy
c. people are such that this decision does not make them happy

The "flavor of universal quantification" in (45b) and (48) is present also in (49a), suggesting that the null object in Italian should be represented as a generic pronoun rather than an operator-variable chain.[24]

These observations hold of the benefactive arguments of <u>easy</u> predicates in English as well. Compare the sentences in (50).

50) a. it isn't fun for everyone to play baseball

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24. This approach is, naturally, inconsistent with one which deals with generics as wide-scope quantifiers subject to QR.

b. it isn't fun to play baseball

51) a. it's not the case that (∀x) [it's fun for x [for x to play baseball]]
b. (∀x) [it isn't fun for x [for x to play baseball]]

The wide scope reading, (51b), is the reading assigned to (50b). As noted in the discussion of (43) above, sentences with only one lexical for + NP sequence are ambiguous. This should mean that, even given the presence of negation, (50a) could have the two SS representations in (52).

52) a. it isn't fun for everyone [PRO to play baseball]
b. it isn't fun pro [for everyone to play baseball]

Structural ambiguity should result in interpretational ambiguity; this seems to be the case in (52), although the judgements are difficult. (50a), on the basis of (52a), should have the reading associated with (51a). (50b) is also a possible representation for (50a) and, since pro appears in the benefactive position in (52b), we would expect it to be able to take wide scope and have the reading in (51b); that is, it should be possible to get the wide scope reading for the quantifier in (50a) by accidental coindexation of the quantifier and pro. I think that this "accidental coreference" reading is possible, e.g. "for all of us, it won't be fun if all of us play baseball (because the batting lineup will be too long)." This should not be taken as evidence that the quantifier takes wide scope in (52b), since another reading is also available: "for everyone (the spectators), it isn't fun for everyone (on

the team) to play baseball."[25] This reading corresponds to the representation (53).

53) (∀x:x ∈ X) [it isn't fun for x (∀y:y ∈ Y) [y to play baseball]]

The accidental coreference reading of (52b) occurs when X=Y, just as in (43c).

In order to have an argument (analogous to Rizzi's for Italian null objects) that benefactives are interpreted as generics rather than quantifiers, it must be shown that overt quantifiers which are undeniably in the benefactive position may not take wide scope. This task is complicated by the structural ambiguities which arise when only one <u>for</u>-phrase is present, as discussed in the preceding paragraphs. Nevertheless, sentences such as those in (54) seem to make this final point.[26]

54) a. It isn't fun for everyone for the kids to play baseball in the living room.
b. It isn't fun for everyone for John to sing songs.

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25. I believe that the "overlapping sets" reading is also available as well, e.g. "for everyone (spectators and players), it isn't fun for everyone (players) to be on the court at the same time."

26. Epstein (p.c.) suggests that while the scope of the null benefactive differs from that of <u>everyone</u>, it matches the scope of non-negative polarity <u>anyone</u> in the same structures, e.g.

iii) It's fun for anyone to play baseball
iv) It isn't fun for anyone to play baseball

However, several authors have argued that <u>anyone</u> is not subject to QR, but rather behaves like a name. See <u>LGB</u>, Aoun, Hornstein, & Sportiche (1981), Hornstein (1984).

As far as I can tell, the wide-scope reading is unavailable for the quantifiers in (54). It could be argued that overt quantifier scope is limited by the presence of a PP node, whereas the scope of the null benefactive is not so limited. The sentences below suggest, however, that benefactive PPs do not inherently limit quantifier scope.

55) a. (Sooner or later,) someone causes problems/makes life difficult for everyone.
b. (Sooner or later,) something is difficult for everyone.

Both of the sentences in (55) allow the wide-scope reading for the quantifiers.

If Rizzi's observations about the generic interpretation of null object pro in Italian extend to the interpretation of null benefactives in English, as I believe the foregoing discussion demonstrates, the question then arises as to whether the English null benefactive is structurally represented on a par with the Italian null object. Within Rizzi's theory of pro, generic objects in English are not structurally represented, in contrast to Italian null objects. This distinction is supported by several empirical arguments, most of which focus on the ability of the Italian null object to be syntactically "active" in situations where the English null object is syntactically "inert". The argument which is relevant for this discussion is the ability of Italian null objects to control

PRO and the inability of English null objects to do so. The relevant paradigms appears in (56) and (57).

56) a. This leads people to the following conclusion.
b. This leads to the following conclusion.
c. This leads people [PRO to conclude what follows]
d. * This leads [PRO to conclude what follows]

57) a. Questo conduce la gente alla seguente conclusione.
b. Questo conduce ___ alla seguente conclusione.
c. Questo conduce la gente a [PRO concludere quanto segue]
d. Questo conduce ___ a [PRO concludere quanto segue]

From this we might conclude that the benefactive argument is, as Epstein argues, structurally represented at all levels, since it is able to control.

The facts concerning control by dative arguments make it unclear whether we can actually come to this conclusion of the preceding paragraph. Null dative arguments may control PRO in both English and Italian. (See Bresnan (1982) and Roeper (1985) for discussion.)

58) a. John gave the order to Bill PRO to leave
b. John gave the order PRO to leave

Null dative arguments differ from Italian null objects (which, by Rizzi's hypothesis, are structurally represented) in one crucial respect: while they may control, they may not serve as anaphor binders. As Rizzi notes, the distinction between null and overt dative arguments is not as strong as that between null and overt non-dative objects since even the overt dative

arguments bind anaphors only marginally. Nevertheless, there is a clear contrast, as illustrated in (59).

59) a. * John said something about themselves/each other/oneself
b. ? John said something to them about themselves/each other

In a very simplified form, Rizzi's analysis of these facts is as follows: control is a syntactic process which consists in the SS coindexation of PRO with a lexically unsaturated θ-role. A θ-role saturated in the lexicon (the process by which (56b) is derived) is not visible for control. If direct object θ-roles are not saturated in the lexicon they must be projected, i.e. structurally represented. Indirect object θ-roles need not be structurally represented even if they are not saturated in the lexicon. Therefore, at SS, an indirect object θ-role which has been neither saturated in the lexicon nor structurally projected is available for control. Binding, however, always requires a structurally present binder.

Although it is difficult to construct a binding test for the benefactive arguments of <u>easy</u> predicates, null benefactives do not seem to be able to bind an anaphor.[27]

60) a. ?' Such problems are easy for John in spite of himself.

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27. There is, of course, the question of whether there is an appropriate command relation between the null benefactive and the anaphor. The anaphor is contained in an adjunct and might, therefore, be in a VP-adjoined position. The relative grammaticality of (60a) suggests that, whatever the structural relation between the position of the benefactive and the anaphor, it is enough like c-command to permit marginal binding.

b. * Such problems are easy in spite of oneself.

If Rizzi's criteria for determining whether null arguments are structurally represented are correct, then we need not assume that benefactive arguments of easy predicates are structurally represented when they are not lexical.

The evidence against structurally representing benefactives is admittedly shaky, but the question of how to represent these arguments is distinct from the question of how their scopal properties are to be dealt with, although naturally the two are related. Concerning the latter question, the preceding discussion has presented strong evidence that the scopal properties of the null benefactive of easy predicates may be explained without recourse to LF movement of the argument, i.e. without positing the existence of an LF null operator.

1.4.2 PRO_{arb} Operators: An LF Approach

Lebeaux (1984) argues that null operators are always involved in PRO_{arb} interpretation, even when benefactive or other sorts of "implicit" arguments are not present.[28] His account of PRO_{arb} is embedded in a unified binding theory for PRO based on (61)-(63).

61) Binding category: ß is the binding category for PRO if ß

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28. The proposals in Sportiche (1983) are similar to Lebeaux's and, therefore, the comments in this section apply to them as well.

is the minimal NP, S dominating τ, where τ is the minimal S′ dominating PRO.

62) Closure: If PRO is unbound in its binding category, adjoin e_i coindexed with PRO_i to the binding category.

63) Operator interpretation: An e in an A′-position, not bound by an A′-antecedent, is construed as an operator O. If O_i is coindexed with an antecedent NP_i, interpret it with the reference of that NP. Otherwise, interpret it as free (i.e. arbitrary), or, in marked cases, with a pragmatically picked out referent.

This approach accounts for the obligatory linked reference of the two PROs in sentences such as those in (64).[29] It also predicts that, if the binding categories of two PROs are distinct, disjoint reference will be possible. The contrast between a single binding category for two PROs and distinct binding categories is illustrated in (65).

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29. Lebeaux notes that the subjects in double gerund constructions need not be identical if they are lexical and gives (i) as an example.

i) His getting up on time will require her setting the alarm clock.

However, consider the same sentence with identical pronouns in the subject positions.

ii) His_i getting up on time will require his_j setting the alarm clock.

The strongly preferred reading is one which sets i=j. The i≠j reading is available only with a strongly deictic interpretation of the pronouns, a possibility not available for PRO. (N. Chomsky (p.c.) suggests that the i≠j reading is easily available if (ii) is properly contextualized.

iii) $John_i$ told $Bill_j$ that his_i getting up on time would require his_j setting the alarm clock.

I do not find that this is the case, but the existence of dialects in which this is so strengthens Lebeaux's point.

64) a. [PRO making a large profit] requires [PRO exploiting the tenants]
b. [PRO to know him] is [PRO to love him]

65) a. [PRO winning the trust of the populace] requires [PRO having to serve in the army]
b. [PRO winning the trust of the populace] requires that [PRO having to serve in the army] be abolished

The (simplified) LF representations that Lebeaux's system assigns to the sentences in (65) are given in (66) and (67).

66) $[_{IP}$ (∀x) $[_{IP}$ $[_{CP}$ PRO_x ...] requires $[_{CP}$ PRO_x ...]]]

67) $[_{IP}$ (∀x) $[_{IP}$ $[_{CP}$ PRO_x ...] requires $[_{CP}$ that $[_{IP}$ (∀y) $[_{IP}$ $[_{CP}$ PRO_y ...] be abolished]]]]

The universal quantifiers which appear in (66) and (67) are inserted at LF, rather than derived by movement of PRO. If PRO itself were subject to QR, such movement would presumably leave a variable in the position of PRO, a non-case-marked position.

Lebeaux argues that the null operator which he proposes to insert at LF creates a representation which is subject to "crossing constraints" and that it is interpreted in a manner similar to relative clauses and tough-movement constructions. The crossing constraints portion of Lebeaux's argument turns on contrast between (68a) and (68b).

68) a. $John_i$ wondered if $Mary_j$ thought O_j that [PRO_j telling him about the dangers] would make real [O_i the difficulty of PRO_i climbing by himself]

b. * $John_i$ wondered if $Mary_j$ thought O_i that [PRO_i telling her about the dangers] would demonstrate [O_j the difficulty of PRO_j climbing by herself]

However, (68b) markedly improves with the changes in (69).

69) John$_i$ wondered if Mary$_j$ knew that [PRO$_i$ telling her about the dangers] was supposed to demonstrate [the difficulty of PRO$_j$ climbing by herself]

Lebeaux assumes a path theoretic approach to crossing; see Pesetsky (1982). In order to maintain that crossing is relevant for control, he must (as he notes on p. 270) examine only the NP$_i$...O$_i$ segment of the "control chain". Including the PRO tail of such a chain in (68a), for example, creates a segment (O$_j$...PRO$_j$) which is not contained in the larger chain (John$_i$...O$_i$...PRO$_i$). This diverges from the account of crossing in Pesetsky (1982) and casts doubt on the applicability of a crossing constraint to control structures.

Lebeaux's null operator also differs from the null operator in OWM constructions in that the latter is never subject to the operator interpretation algorithm in (63); null operators binding gaps in governed positions never receive arbitrary interpretation, as shown in (70).

70) a. * John$_i$ is too angry [Op$_{...i}$ [PRO$_i$ to talk to t$_{...i}$]]
b. * John$_i$ went to Paris [Op$_{...i}$ [PRO$_i$ to talk to t$_{...i}$]]
c. * John bought a dog$_i$ [Op$_{...i}$ [PRO$_i$ to guard t$_{...i}$]]

71) a. John$_i$ is too angry [[PRO$_i$ to talk to anyone]]
b. John$_i$ went to Paris [[PRO$_i$ to talk to Bill]]
c. John bought a dog$_i$ [[PRO$_i$ to guard his kids]]

(71) illustrates that, unlike infinitival relatives and <u>tough</u>-movement constructions, the embedded clauses in (70) do not

require the presence of a null operator chain coindexed with a matrix NP in order to be licensed.

At this point in our understanding of control theory, PRO$_{arb}$ is as an anomaly. An explanation of the arbitrary interpretation of PRO is an analysis which either demonstrates that PRO$_{arb}$, in spite of appearances to the contrary, behaves like controlled PRO or one which derives PRO$_{arb}$'s anomalous behavior from other, independently motivated aspects of the grammar. Lebeaux attempts the former strategy, but his analysis involves positing the existence of an anomalous null operator, i.e. one which itself requires an explanatory analysis. In effect, we could replace (62) and (63) above with (72)

72) a. If PRO is unbound within its binding category, assign arb$_i$.
b. If arb$_i$ and arb$_j$ are minimally contained within the same binding category, then i=j.

and obtain a simpler, equally adequate analysis.

1.4.3 PRO$_{arb}$ Operators: An SS Approach

Borer (1986) also proposes an account of PRO$_{arb}$ which involves a null operator. This account differs substantially from those discussed above in being formulated within an innovative approach to control which assumes (i) that all null subjects are pro and (ii) that AGR can be anaphoric and, as such, requires a binder which can transmit i(nflectional)-features (e.g. person, number, gender). Like Epstein, Borer argues that the null operator responsible for arb interpreta-

tion is base-generated in a VP-internal argument position. This is, of course, problematic given the sentences in (64) and (65). Her analysis differs from Epstein's in two important respects: the null operator is not base-generated as pro and it moves to an IP-adjoined position at SS.

The proposal that quantifier movement is at SS is intended to explain the scopal properties of PRO_{arb} discussed with respect to (41), since SS movement is generally constrained by the Subjacency Condition. (Recall that Epstein ascribes these scopal properties to the allegedly clause-bounded nature of QR.) This proposal has two problems. The first is that, while SS adjunction is subject to the Subjacency Condition, this does not bar successive cyclic adjunction creating "long-distance dependencies" of the sort illustrated in (73).

73) This book$_i$, Mary thinks that John would like t_i

Therefore, in a sentence such as (41a), repeated as (74a), there should be no problem in obtaining a wide scope interpretation with a representation as in (74b).

74) a. Josh said it is fun to play baseball.

b. [(∀x) [Josh said [t_x' [it is fun t_x [pro_x to play baseball]]]]]

c. This game$_i$, Mary thinks it's fun to play t_i

(74c) indicates that extraction via adjunction is possible from within the complements of <u>easy</u> predicates.

In addition, if this null operator is a quantifier, it is unclear why it should be forced to take scope, i.e. move to an adjoined position, at SS. No other quantificational operator in English exhibits such behavior. If this operator is not a quantifier, but rather should be compared to the operators in OWM constructions, its behavior is even more puzzling given that, in English, other SS null operators do not (i) receive arbitrary interpretation in the absence of a "close enough" antecedent, (ii) allow split antecedents[30], or (iii) allow long distance antecedents. (70) illustrates (i); (75) and (76) illustrate (ii) and (iii), respectively.

75) a. * Mary$_i$ knew that Bill$_j$ was too angry [Op$_{i,j}$ for [John to photograph t$_{i,j}$]]
b. * John$_k$ bought the dog$_i$ a ball$_j$ [Op$_{i,j}$ [PRO$_k$ to play with t$_{i,j}$]]
c. * Mary sent John$_i$ [a student$_j$ [Op$_{i,j}$ that [she had introduced t$_{i,j}$ to each other]]]

76) a. * Mary$_i$ knew that Bill$_j$ was too angry [Op$_i$ [PRO$_j$ to talk to t$_i$]]

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30. Kirkpatrick (1982) has argued that null operators in OPCs do take split antecedents, giving (i) as an example of this.

i) He gave a gold ring$_i$ to Sue and a silver one$_j$ to Harry to exchange e$_{i,j}$ at their wedding anniversary.

Notice, however, that the split antecedent reading is unavailable when a conjoined structure is not involved.

ii) * He gave a gold ring$_i$ to Sue after giving a silver one$_j$ to Harry to exchange e$_{i,j}$ at their wedding anniversary.

This is not the case for PRO subjects. (Example from KoL.)

iii) Bill$_i$ wanted Tom$_j$ to agree that it was time PRO$_{i,j}$ to swim across the pond together.

b. * Mary warned Bill$_i$ [that John$_j$ had bought a dog [Op$_i$ [PRO$_j$ to irritate t$_i$]]]
c. * the dog$_i$ bit [the man$_j$ [Op$_i$ that Mary wondered whether he$_j$ owned t$_i$]]

As noted at the end of the previous subsection, proposing the existence of a null operator with the properties of PRO$_{arb}$ does not offer a real solution to the problem of arbitrary interpretation of null subjects.

Chapter Two

OWM Constructions

2.1 Introduction

This chapter will focus on a set of constructions which includes relatives (tensed and infinitival), adjectival complements, degree clauses, clefts and purposives. All but the latter are first analyzed as covert movement constructions in "On Wh-Movement" (Chomsky (1977)); hence, the name given to this set in chapter one: "OWM constructions". (Purpose clauses are added to the set in OB.) As mentioned in chapter one, certain of the constructions discussed in OWM will be left aside here, specifically embedded wh-questions, topicalization constructions and comparatives. Embedded wh-questions will not be discussed because they always involve an overt operator. As for topicalization, I will follow Lasnik & Saito (forthcoming) who argue that sentences such as (1a) involve adjunction to IP and no null operator, as shown in (1b).

1) a. John, I like.
   b. [$_{IP}$ John$_i$ [$_{IP}$ I like t$_i$]]

Finally, although I believe that comparatives involve null operators, a coherent analysis of the various types of comparative constructions, which display a complex array of syntactic and semantic properties, is beyond the scope of this dissertation. Nevertheless, at some points I will include exam-

ples of comparatives in the discussion when their behavior is transparently related to that of other OWM constructions.

In OWM and OB, Chomsky takes the clause minimally containing the null operator chain to function as a predicate by virtue of the "open position" created by null operator movement. The interpretation of OWM constructions is then given by a rule of predication which relates this predicate and the NP antecedent of the null operator chain. One might, therefore, regard the null operator as the syntactic equivalent of a lambda operator; the same is naturally true for overt operators which appear in these constructions. I will have little (in some cases nothing) to say about the semantics of OWM constructions, though the topic is one which, especially in a discussion of syntactic predication, always lurks nearby.

The conditions under which null operator chains are licensed to appear in OWM constructions cannot simply be stated in terms of predicates: not all predicates support null operator chains and many predicates exist as such without a null operator chain to "create an open sentence." Therefore, the first task of this chapter will be to clarify what I mean in using the terms "predicate" and "predication" in the discussion of null operator constructions and to determine the nature of the relation between clausal predicates and their operators, whether overt or null. This introductory discussion constitutes §2.2. In §2.3 I will show how the general licensing mechanism for clausal predicates plays a role in licensing null operators, which I take to be the null pronominal, pro.

The argument in §2.3 is developed in the course of a detailed analysis of purpose clauses which begins by sorting out several properties which are not contingent on the null operator. The conclusion of §2.3 is that operator pro, like subject pro, is identified via agreement; in the case of operator pro the agreement relation is set up by means of an "agreement chain". In §2.4 I extend this analysis to relative clauses, showing that it is this relation which is responsible for the phenomena attributed in Safir (1986) to "R-binding". In §2.4 I will also sketch an possible analysis of degree clauses with implications for the analysis of adjectival complement constructions.

2.2 Predicates and Operators

Natural languages are full of examples of predicates which are fully licensed without the intervention of null operators. In §2.2.1 I will try to clarify what, if anything, such predicates have in common with predicates which require the presence of a null operator. In addition, if null operator chains do "create open sentences", it is necessary to define what this means syntactically and in a manner which is consistent with the other options for creating open sentences which exist. This is the subject of §2.2.2, which contains a survey of the predicate-creating options available in various OWM constructions. Finally, in §2.2.3, some examples are discussed which indicate that certain predicates are incompatible with

null operators under any circumstances; two possible explanations for this incompatibility are discussed.

2.2.1 What is Predication?

In Williams (1980), predication is the relation which holds between the bold constituents in the examples below, which are predicates, and the underlined NPs, which are subjects of the predicates. (Examples from Williams (1980).)

2) John **died.**

3) a. John **made** Bill **sick.**
   b. John **made** Bill **a doctor.**
   c. John **kept** it **near him.**

4) a. It **was** John **that I saw.**
   b. a man **to do the job**
   c. I **bought** it **to read**

5) a. John **promised Bill to leave.**
   b. John **persuaded** Bill **to leave.**
   c. John **tried to leave.**
   d. John **died waiting for a bus.**
   e. It **is clear** that he is here.

According to Williams, any of the categories AP, PP, NP, VP, S and S′ may be predicates. (2) and (3) show the first four of these acting as what Williams calls "simple, or headed, predicates". In the case of simple predication, the subject is the external argument of the head of the predicate. As proposed in Williams (1980) and developed in subsequent work (Williams (1981, 1983, 1984, 1986) an "external argument" is one which appears outside of the maximal projection of a head and which receives its θ-role by virtue of the predication relation holding between it and the maximal projection of the head, not

by being a sister to (or governed by) the head, as is the case with complements.

In contrast, the clausal categories S and S′ are "complex predicates" and are able to function as such only when they contain a "predicate variable", that is, when they take the following forms:

6) a. [$_{S}$ PRO VP]
   b. [$_{S'}$ (PRO/WH) S]

In (6a), PRO is the predicate variable and in (6b), either PRO (Williams' null operator) or WH (an overt wh-operator) is the predicate variable. PRO cannot be replaced by a lexical NP in (6a) since, by definition, there would no longer be a predicate variable to create a predicate from S. VP may also be a complex predicate when it contains an NP-trace. That is, in (7a) Bill is not the subject of seen t by virtue of the θ-role it receives from the verb. The structure assigned to (7a) by Williams (1981, 1986) is shown in (7b).

7) a. Bill$_i$ was seen t$_i$
   b. Bill$_i$ was [seen t$_i$]$_{VP_i}$

Williams (1981) argues that the VP in (7b) becomes a complex predicate because it contains a predicate variable, t$_i$. A similar analysis is given of constructions with raising verbs. (For a summary of the Williams (1986) analysis of these constructions see fn. 3.)

According to Williams' (1980) predication theory, all predicates must be XPs. Subjects and predicates share the same

referential index and the index on the predicate functions as an abstraction operator. Subjects and predicates must also meet a locality constraint which is adequately characterized as mutual c-command for the purposes of this discussion.[1] Since no XP, whether subject or predicate, can have more than one referential index, Williams is able to derive the fact that no lexical head has more than one externalized argument and no predicate has more than one subject. (The cases covered by the first assertion are a proper subset of those covered by the second assertion, since the second includes complex predicates; the subject of a complex predicate is not the externalized argument of any lexical head.)

Leaving aside the examples in (5) and examples such as (7) which involve complex VP predicates, the remaining cases of predication, in (2) - (4), can be divided into two groups: those which involve the assignment of a θ-role by the predicate to the subject and those which do not. In order to illustrate how these two types of predication are related, I will summarize the predication-based theory of θ-role assignment

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1. In Williams (1980) this constraint is related to a c-command requirement on antecedents and their traces by the following filter:

i) In [Predicate Structure], NP must c-command any predicate or trace coindexed with it.

This generalization is licensed by the assumption that all indices involved are referential indices (in the sense of Chomsky (1980)).

found in Williams (1986)[2], but first the following point should be noted: the thematic/non-thematic distinction just mentioned has nothing to do with Williams' (1980) "thematically governed" and "grammatically governed" cases of predication. Thematically governed cases of predication involve predicates in the VP and require the subject of predication to be a theme of the verb. Some examples are in (8), where again the predicate is bold and the subject underlined.

8) a. John gave Bill <u>the dog</u> **dead.**
b. <u>John</u> became **sick.**
c. John made <u>Bill</u> **sick.**

Grammatically governed cases of predication are those which meet the structural descriptions in (9).

9) a. <u>NP</u> VP (e.g., John died.)
b. <u>NP</u> VP X (e.g., John left angry.)
c. <u>NP</u> be X (e.g., John is sick.)

All of the cases in (8) and (9) involve the assignment of a θ-role by the predicate to the subject. Since I am interested primarily in the distinction between θ-related predication and non-θ-related predication, I will ignore Williams' proposed distinction between thematically and grammatically governed environments of predication.

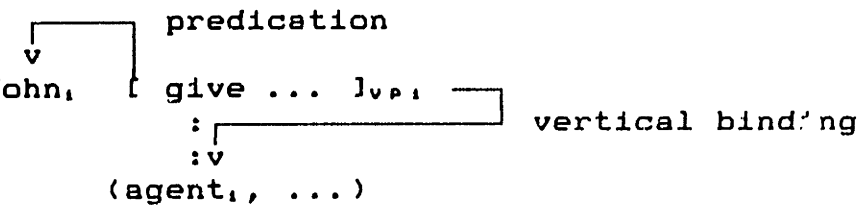
Three sorts of θ-role assignment are discussed in Williams (1986): (i) internal θ-role assignment, (ii) external θ-role assignment (vertical binding), and (iii) predication.

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2. Thanks to Tova Rapoport for bringing this article to my attention and for helpful discussion of these issues.

The subject NP in (9a) receives its θ-role as a result of both (ii) and (iii). The external θ-role of a verb is "vertically bound" by the VP. Vertical binding, according to Williams, is a kind of lambda abstraction which allows the external θ-role to be assigned by the VP to the subject NP by predication. These relations are shown in (10b).

10) a. John gave it to him.

b. 

The relation between θ-role assigners and assignees is governed by the θ-Role Assignment Constraint (TRAC).

11) TRAC: No phrase at all can intervene between an assigner and an assignee.

In general, the TRAC prevents a VP from vertically binding an external θ-role in the θ-grid of a category which is not its head, e.g. the verb of a complement clause. Only in cases such as (12a) (and in the case of raising and passives[3]) does the

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3. Williams (1986) argues in favor of a predication theory approach to NP-trace which eliminates the need for A-chains, NP-movement and small clauses. He also argues against a mixed approach, e.g. a theory involving both A-chains and predication such as that adopted in this dissertation. I will not argue against the "pure predication" analysis of raising and passive but will continue to assume the mixed approach. I include a summary of Williams' (1986) analysis of NP-trace (which constitutes the rest of this footnote) to further clarify the role of predication in his theory.

Williams' θ-criterion differentiates between "assign-

VP vertically bind something that is not the external argument of its head.

12) a. John seems sad.

b. $John_i$ [seems AP_i $]_{VP_i}$

:

A'_i

:

sad

:

(θ_i)

In (12a), as illustrated in (12b), the VP may bind the external argument of the AP, since <u>seems</u> has no external argument. Notice that the TRAC subsumes the mutual c-command requirement on predication (see fn. 1).

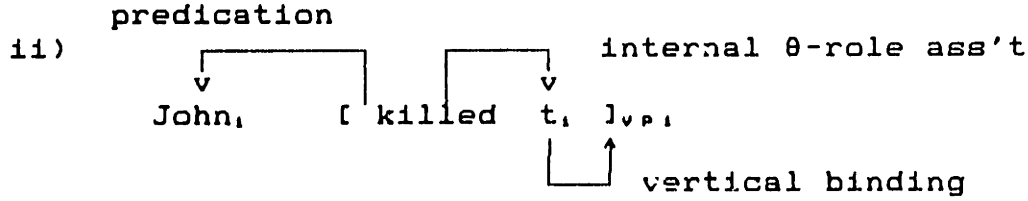
In the normal case of θ-role assignment to a non-derived subject, the TRAC imposes a locality constraint on two relations: the relation between the subject and predicate and the relation between the predicate and the element within the predicate which allows it to act as such. In the case of non-thematic predication, e.g. (4) above, the subject of the pre-

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ment" of θ-roles and "satisfaction" of θ-roles. NP-trace may be assigned a θ-role but it does not satisfy a θ-role. In (i), <u>killed</u> assigns a θ-role to t_i, but since t_i can't satisfy this θ-role, it reassigns the θ-role to the VP. The θ-role is then reassigned via predication to the subject NP. Therefore, in (i), all three means of θ-role assignment participate in the assignment of a θ-role to <u>John</u>, as illustrated in (ii).

i) $John_i$ was killed t_i

ii) predication



dicate does not receive a θ-role from any head within the predicate, nevertheless, similar locality constraints seem to be at work.

Consider the case of relative clauses: it is well-known that overt relative clause operators must be in the SPEC of the relative clause, i.e. they cannot appear in the SPEC of a lower CP contained in the relative clause, as illustrated in (13a). The same is presumably true for null relative operators; like (13a), (13b) is generally assumed not to be a possible representation.

13) a. * the man $[_{CP}$ $[_{IP}$ I know who$_i$ Bill likes t_i]]
b. * the man $[_{CP}$ $[_{IP}$ I know O_i Bill likes t_i]]

Similarly, in the case of infinitival relatives, such as (14), only the "topmost" subject in the relative clause can be the licensing gap, the "predicate variable" in the terms of Williams (1980). This is illustrated in (15).

14) a man$_i$ $[_{CP}$ $[_{IP}$ PRO$_i$ to fix the sink]]

15) a. * the people$_i$ $[_{CP}$ $[_{IP}$ it is illegal PRO$_i$ to cross this border]]
b. * the woman$_i$ $[_{CP}$ $[_{IP}$ John$_j$ is too stubborn PRO$_i$ to bother herself$_i$ about e$_j$]]

Note that the problem with (15) cannot be the status of the head of the relative clause as an antecedent for PRO, since the relative head in (14) is perfectly able to antecede PRO under the appropriate conditions. It might be argued that (15a) is out because PRO is in a position of obligatory <u>arb</u> interpretation and the "reference" for PRO, as for any ele-

ment, cannot be fixed in more than one manner. This argument, while plausible for (15a), does not go through for (15b). Although PRO in (16a) may be given an arb interpretation, (16b) shows that it may also be controlled by an NP outside the domain of CP~.

16) a. John$_j$ is too stubborn PRO$_{arb}$ to bother about e$_j$
b. Mary$_i$ thinks [$_{CP}$ John$_j$ is too stubborn PRO$_i$ to bother herself about e$_j$]

What is it that rules out (15b) in spite of the grammaticality of (16b)?

Williams (1980) accounts for the facts in (13) - (15) by the stipulation that clauses are licensed to act as predicates only when they take the forms in (6), repeated below.

6) a. [$_S$ PRO VP]
b. [$_{S'}$ (PRO/WH) S]

(He analyzes (14) as a bare S (=IP) rather than an S′ (=CP).) It should be obvious that whatever locality constraint is responsible for (13) - (15) bears a striking resemblance to the TRAC. Consider the following predication structure:

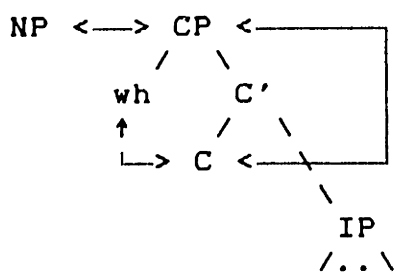
17) NP$_i$ [$_{CP\,i}$ wh$_i$ ...]

If vertical binding is a structural relation involved in, but distinct from, θ-role assignment, then we can say that CP$_i$ vertically binds wh$_i$, a non-interrogative wh-operator in the SPEC of CP$_i$. If no phrasal boundaries (maximal projections) may intervene between a vertical binder and bindee, then the

impermissibility of (13) and (15) follows. The relation of vertical binding and a version of the TRAC could be imported into the modified Barriers framework I have adopted, but this is not necessary since the means for building an account of (13) - (15) already exist within the theory.

I take the relation which holds between a subject and predicate to be characterized by (or to entail) agreement. In languages with richer systems of agreement than English, the effects of the agreement relation are visible on categories other than V. Extending the approach generally taken with regard to Case, I assume that relations which are overtly manifest in some languages (or some subset of a language) hold covertly even when morphological evidence for them is lacking. Thus, agreement holds between all subjects and predicates, not just those which exhibit morphological agreement features. In the predication structure in (18) NP and CP agree by virtue of being subject and predicate; by convention, C agrees with its maximal projection CP and C agrees with wh (SPEC-HEAD agreement) as well.

18)



I propose that predicates which are not licensed as such by virtue of a θ-relation between the head of the predicate and

the subject[4], must be linked to their subjects by an "agreement chain" such as that which holds between the NP subject of predication in (18) and the category in the SPEC of the predicate. The proposal is summarized in (19).

19) A subject-predicate relation is licensed if[5]

a. the subject discharges the external θ-role of the predicate or
b. the subject agrees with a chain contained in the predicate.

(19b) need not be given a more specific formulation as long as "agree" is understood to exclude the possibility of accidental coreference. Notice that, with (19b) in the grammar, there is no need to assume that relative COMPs are marked [+wh] in order to motivate movement of an overt relative operator; movement of any relative operator, overt or null, will be necessary to set up the agreement chain which satisfies (19b). The infinitival relative case in (14) (and other cases to be

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4. I use the vague locution "a θ-relation which holds between the head of the predicate and the subject" (rather than "assigning an external θ-role to its subject") so as to encompass the various types of θ-relations discussed in Higginbotham (1985), only one of which corresponds to the relation generally termed "external θ-role assignment".

5. I do not use the stronger "if and only if" here since I wish to leave open the possibility that there are other means of licensing the subject-predicate relation. For example, if the relation between the underlined and bold constituents in (i) is a subject-predicate relation, it would not fall under either clause of (19). The same is true of (ii) if there is no covert operator in English left-dislocation structures.

i) As for the party, I think we should make about 3 gallons of chili.
ii) This book, I think that every student should buy it.

discussed in §2.2.2) falls under (19b) if, like Williams (1980), we assume that infinitival relative clauses such as those in (14) are bare IPs, as illustrated in (20).

20) $[_{NP}$ a man $[_{IP}$ PRO to fix the sink]]

In order to ensure that PRO is ungoverned, it is only necessary, within the Barriers framework, that IP in (20) fail to be L-marked. Since it seems very likely that a relative clause is not L-marked, the status of PRO is not a problem for this analysis. For ease of reference, I will adopt Williams' term "predicate variable" to refer to the PRO subject in predication IPs such as that in (20) and to the operators in predicate CPs.

2.2.2 Predicate Variables and OWM Constructions

Two basic forms of predicates with predicate variables have been discussed so far: IPs with PRO subjects and CPs with operator SPECs (either overt or null). Thus far, the examples of the latter we have seen have all shown the operators binding a null variable. The operators in clausal predicates (in certain constructions) may also bind resumptive pronouns, as illustrated in (21).

21) the man$_i$ that/who$_i$ I can't remember whether he$_i$ likes Bill or not

The acceptability of resumptive pronouns varies depending on the language examined, the construction in which they appear

and a multitude of other factors governing their distribution. I will have almost nothing to say about resumptive pronouns and will certainly not offer anything like a complete analysis of the phenomenon, if indeed there is a unified "resumptive pronoun phenomenon". (See Sells (1984) for an extensive treatment of resumptive pronouns which differs substantially from the approach sketched here.) (19b) forces an analysis of constructions with resumptive pronouns which obligatorily involves an operator, a type of analysis argued against by Chao & Sells (1983) and Sells (1984). Some consequences of this position will be discussed in §2.4. For now I will simply assume it and go on to the main question to be answered in this subsection: are all OWM constructions licensed equally well with each of the options for creating a predicate variable? OWM constructions will be tested for grammaticality under the following predicate variable options: a PRO subject, an operator (null or overt) binding a gap, an operator (overt or null) binding a resumptive pronoun, and no predicate variable. The distribution of null and overt operators will be discussed in chapter four.

[A terminological note: in discussing OWM constructions I will, when necessary, refer to the CP which hosts the null operator (and which sometimes hosts overt operators, depending on the particular construction) as the "OWM clause". This is intended to avoid confusion in the cases where there is more than one predicate or more than one operator in a construction.]

Consider first the case where there is no predicate variable in the OWM clause. Only degree word clauses are completely well-formed in this case.

22) a. The coach is too incompetent for the team to win the championship.
b. The guard is corrupt enough for us to take anything we want out of this bank.

23) a. * This weather is difficult for John to arrive on time.
b. ?? Mary bought a new car for Susan to impress her friends.
c. * I have fewer apples than Mary has too many oranges.
d. * It was baseball that they discussed the Red Sox for hours.[6]
e. * A book for Mary to cheer up arrived by mail today.

By (19) the OWM clauses in (22) cannot be predicates. This is, I believe, a correct result: the clauses in (22) are negative result clauses, comparable to the result clause in (24).

24) John was so sick that we had to take him to the hospital.

The proper analysis of (22) will be taken up in §2.4.

Only infinitival OWM constructions could host a predicate variable which is a PRO subject. Of the infinitival OWM constructions, only degree word clauses, infinitival relatives and some kinds of purpose clauses are grammatical with this option, as illustrated in (25) - (27). Tough-constructions, the remaining type of infinitival OWM construction, are

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6. I have tried to create as an example a sentence which would be plausible as a focus construction of a sort which did not require a gap, e.g. "as for baseball, they discussed the Red Sox for hours."

ungrammatical with the PRO subject predicate variable, as shown in (28).

25) a. The union hired guards to protect the members on the picket line.
b. John bought a Porsche to impress his friends.
c. Mary built a shed to house the John Deere.

26) a. The coach is too shrewd to let McHale play with an injured foot.
b. This guy is gullible enough to believe Ted Koppel is sincere.

27) a. a man to fix the sink
b. the war to end all wars

28) * John is difficult to solve these problems.

The ungrammaticality of (28) is no doubt related to the exceptional θ-properties of this construction.

As is well-known, English relative clauses host resumptive pronouns at a certain marked level of acceptability given the essentially non-resumptive character of English. It is to be expected that resumptive pronouns in any construction in English would display the same degree of markedness. This prediction is true for clefts, as illustrated by (29).

29) ?? It was John that I couldn't remember whether he was a good athlete or not.

However, among the OWM constructions there are several (mild) exceptions to this prediction. One of these exceptions is the complete grammaticality of sentences such as those in (30).

30) a. John is too angry for anyone to try to talk to him now.
b. The pie is cool enough for us to eat it now.

The apparently exceptional grammaticality of (30) obviously follows from the grammaticality of (22), that is, the sentences in (30) are not true resumptive pronoun constructions but rather are result clauses like the clauses in (22). The link between the matrix NP antecedent in the sentences in (30) and the pronouns contained in the result clauses is accidental coreference. No operator is involved, as is the case in true resumptive pronoun constructions. Thus, the sentences in (30) do not display the marginality associated with resumptive pronoun constructions in English.

Purpose clauses and infinitival relatives are also exceptions to the prediction that OWM constructions with resumptive pronouns will be only as marginal as relative clauses with resumptive pronouns. One would expect that infinitival relatives, in particular, would pattern with tensed relatives, but this the contrast between (31) and (32) indicates that this is not the case.

31) ? the guy that I wonder whether we should invite him or not ...

32) I was assigned --
a. * a problem to figure out how to solve it[7]
b. * a problem to solve it
c. * a candidate to find out how to interview him
d. * a candidate to interview him

33)?? John gave his kid a new toy to play with it

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7. (32a) and (32c) become acceptable if the clause is interpreted as a RatC-type purposive (see below), i.e. "I was assigned a problem (in order to) figure out how to solve it." This reading is irrelevant for the discussion, however.

N. Chomsky (p.c.) suggests that the ungrammaticality of (32) indicates that the clauses in (32) are not actual relatives. As evidence for this position he proposes that the sentences in (34) are not as grammatical as they should be if they are relative clauses.

34) a. a man to fix the sink arrived
b. I met a man to fix the sink
c. A problem to solve appears on page 15.
d. I read about a interesting problem to solve in this journal.

While I agree that these are not as acceptable as their tensed counterparts, I find that the comparable sentences below are fully grammatical.

35) a. A man to fix the sink came by this afternoon.
b. I bought [some cards to play poker with] to give to Mary.
c. So many people to interview came to the meeting that we had to schedule another session.

Chomsky points out that many examples of infinitival relatives given in the literature appear with the matrix verb <u>find</u>; it is possible that the clause in such examples may be related to the verb rather than to the NP. This would explain both the ungrammaticality of examples which do not appear with verbs such as <u>find</u>, e.g. the sentences of (34), and the unexpected grammaticality of (36).

36) Which sink did you find someone to fix?

(36) should not be grammatical under current assumptions about extraction from within relative clauses. However, I find (37) approximately as acceptable as (36).

37) Which movie star did you meet someone who knew t

The slightly greater marginality of (37) is to be expected given the tensedness of the relative clause; see chapter four for further discussion of the role of tensed IP in creating bounding violations.

It might be that the incompatibility of infinitival relatives and purpose clauses with resumptive pronouns has to do with the interaction of the following two unrelated factors: (i) infinitival relatives and purpose clauses generally resist embedding; (ii) resumptive pronouns are generally only possible within islands (i.e. in embedded positions).

Contrary to the point just made, the relative acceptability of (38) might be taken as evidence that resumptive pronouns appear rather freely with purpose clauses.

38) John brought Bill along to introduce him to the class.

However, such a conclusion is incorrect since the adjunct clauses in (33) and (38) are of two different types. I will adopt for the moment the typology of purposives laid out in Jones (1985).[8] According to Jones, there are three basic types

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8. Some modifications of this typology will be offered in §2.3, as well as an analysis which differs from Jones's in many crucial respects.

of purposives, which differ in their interpretations and syntactic properties. These three types he calls rationale clauses (RatCs), subject-gap purpose clauses (SPCs) and object-gap purpose clauses (OPCs). Examples are given below.

39) a. They brought John along [$_{RatC}$ (in order) to talk to him]
b. They brought John along [$_{SPC}$ to talk about himself to the students]
c. They brought John along [$_{OPC}$ to talk to]

RatCs may, as indicated, appear with the optional in order phrase as well as an optional lexical subject, e.g. "They brought John along in order for us to talk to him." RatCs without lexical subjects differ from SPCs in that a RatC subject is controlled by the matrix agent, while an SPC subject is controlled by a non-agent NP.[9] OPCs are characterized by the presence of an object gap; control of an OPC subject is by either the matrix subject or indirect object.[10] RatCs do not require a predicate variable, as illustrated by (40).

40) John worked hard on his presentation (in order) to impress the owners of the company.

As with too-result clauses, a pronoun which occurs in a RatC need not be interpreted as a resumptive pronoun because RatCs

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9. That the appropriate distinction is thematic rather than structural is shown by the control facts below.

i) The boat was sunk in order to win a prize.
ii) John was sent to the store to buy some groceries.

10. Control of OPC subjects is not free, however. See §2.3 for discussion.

do not require a predicate variable; pronouns such as those in (38) and (39a) are simply accidentally coreferential with a matrix antecedent. Looking back at the sentence in (33), repeated as (41), it is possible to interpret the bracketed clause either as a RatC or as an OPC with a resumptive pronoun.

41) John$_i$ bought his son$_j$ a train set [PRO$_{i/j}$ to play with it]

The construction is markedly more acceptable when interpreted as a RatC, i.e. with matrix subject control, and becomes completely acceptable (in my dialect, at least) with an emphatic reflexive: "PRO$_i$ to play with it himself$_i$". When interpreted as an OPC with dative object control the construction is noticeably more marginal. Additional differences between the various types of purpose clauses will be discussed in the next section.

The array of possibilities just discussed is summarized in the chart below. I have not differentiated between null and overt operators as their function is essentially the same in OWM constructions and their distribution is governed by factors (to be discussed in chapter four) which are unrelated to this function. "Purpose" refers only to OPCs, as defined above. "No PV" refers to the case where the OWM clause contains no predicate variable.

42)

	no PV	res pro	PRO	gap
tough	*	*	*	ok
purpose	*	??	ok	ok
inf. rels	*	??	ok	ok
clefts	*	??	*	ok
tns. rels	*	??	*	ok
too	ok	ok	ok	ok

The purpose of this subsection has been to get the facts straight about the distribution of the various sorts of predicate variables among the OWM constructions. The general conclusion to be drawn from the discussion is essentially that of Williams (1980): clauses require predicate variables in order to function as predicates. All the available options are made use of within the general constraints imposed by the grammar. This suggests that it is somewhat misleading to characterize the OWM constructions under study in this dissertation as "null operator constructions". Their defining characteristic is not that they host null operators, but that they require predicate variables, the null operator option being but one choice among several for fulfilling this requirement.

2.2.3 Incompatible Predicates and Predicate Variables

In an earlier paper (Browning (1986)) I claimed that null operators obligatorily created predicates; that is, any category with a null operator in its SPEC would be interpreted

as a predicate at LF. This forced the deletion of the null operator in a parasitic gap construction in the mapping from SS to LF. If the null operator were to remain in the SPEC of CP at LF a violation would arise in a sentence such as (43) since CP~ must be interpreted as a predicate, which would presumably be ruled out for several reasons (e.g., no subject in an appropriate structural relation, no possible interpretation, etc.).

43) the book that I read t [$_{PP}$ without [$_{CP}$~ O [PRO understanding e]]

This argument fails to account for the ungrammaticality of the sentences in (44), however.[11]

44) a. * I consider John$_i$ [O$_i$ [a great admirer of e$_i$]]
b. * John$_i$ is/has become [O$_i$ [proud of e$_i$]]
c. * I consider John$_i$ [O$_i$ [proud of these pictures of e$_i$]]

In these sentences the null operator resides in a category-internal position within an NP or AP which is a predicate independently of the presence of a null operator chain. By hypothesis, APs and NPs are structurally able to host null operators; this assumption is crucial to my analysis of parasitic gaps (see chapter three) given the existence of grammatical sentences such as those in (45).

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11. I am indebted to Tim Stowell for pointing out the significance of sentences such as these.

45) a. Who$_i$ was John too proud of t_i to criticize t_i?[12]
b. the man who$_i$ close friends of e_i admire t_i

Given that the categories containing null operator chains in (44) are predicates and that there is a "landing site" for null operators within those categories, what prevents the sentences in (44) from being well-formed? Any structural locality condition (e.g. government, subjacency, or mutual c-command) satisfied in the licensing of grammatical null operator constructions, is surely met in the sentences in (44).

Notice that the ungrammaticality of (44c) indicates that these sentences cannot be ruled out by assuming that <John, O, e> is a "composed chain" and that there is a special condition which prevents the internal and external θ-roles of a head from being assigned to members of the same composed chain. I mention a hypothetical "special condition" to rule out these sentences rather than simply the θ-criterion since, if we allow the existence of this sort of "composed chain" at all, the θ-criterion cannot be interpreted as applying to the chain as a whole. Each such chain would contain two arguments and two θ-positions, thereby standing in violation of the θ-criterion (at least in its current formulation). Since the θ-

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12. Both empty categories occupy positions which are possible launching sites for movement, as shown by the grammaticality of (i) and (ii). Therefore, both are designated t_i.

i) the person that John was too infatuated with t to concentrate on his work
ii) the homework that John was too tired to complete t

criterion could not apply to such a composed chain, it could not be the source of the ungrammaticality of (44).

An obvious difference between the OWM constructions which host predicational null operators and the sentences in (44) is that in the former the host category for the null operator chain is a CP, while in the latter it is either an NP or AP. If the distribution of null operators in predicational structures corresponds more or less to the distribution of overt operators in such structures, then we would not expect the null operators in (44) to be licensed. This aspect of the distribution of null operators could be expressed in the following condition, which is essentially a contextual definition of a null operator.

46) An empty category is an operator only if it is in the SPEC of CP.

To rule out (44), this condition must be combined with a requirement that variables be operator-bound. For the moment I will leave open the question of whether the latter requirement is incorporated into the definition of variable or imposed as an independent constraint; see chapter three for further discussion. The sentences in (44) are therefore ruled out because the variables fail to be operator-bound at any level.[13]

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13. Notice that the condition on variables need not be "locally operator-bound" so long as variables are subject to Condition C of the Binding Theory (or an equivalent condition).

The ungrammatical sentence in (47a) offers further evidence for (46) and for the position of the null operator in less complex sentences, such as (47b).

47) a. * John$_i$ is too proud of e$_i$' for us to criticize e$_i$ effectively
b. John$_i$ is too angry to talk to e$_i$

The interpretation "John is too proud of himself for us to criticize him effectively" is perfectly coherent and a version of (47a) with only one gap, as below, is grammatical.

48) John is too proud of himself for us to criticize e effectively[14]

Therefore, the ungrammaticality of (47a) must have something to do with the null operator chain including e$_i$'. Keeping in mind that the null operators of predicational constructions such as these do license parasitic gaps when the gap is within the CP hosting the null operator chain, (49a), and that parasitic gaps may occur within the complement of an adjective, (49b), consider the (simplified) structure for (47a) in (50).

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14. (48) isn't perfect to my ear, though some speakers find it so. The presence of the adjectival complement may have something to do with this awkwardness, as I find (i) much than (ii).

i) John is too arrogant for us to criticize e effectively
ii) John is too proud of his kids for us to criticize e effectively

Note that construing the gap with the adjectival complement is completely impossible in (ii).

49) a. This spinach is too dirty to eat e without washing e
b. Who$_i$ was John too proud of t_i to criticize t_i

50) John$_i$ is [$_{AP}$ O_i' too [$_A'$ proud of e_i'] [$_{CP}$ O_i for us to criticize e_i]][15]

It may be that copular constructions such as these are base-generated with a small clause structure and derived by raising the subject to [NP,IP] position. This is not relevant for the discussion and so I will keep to the simplified structure in (50). In this structure O_i' is the parasitic operator and e_i' the parasitic gap. (50) does not seem to violate any of the constraints which are known to rule out parasitic gaps: neither gap c-commands the other; an operator c-commands both gaps; neither of the gaps is a subject or adjunct; neither gap is "too far" from the other or an operator to be licensed.[16]

It might be argued that (50) is not allowed because the parasitic operator O_i' c-commands the operator O_i. Taking

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15. I have not yet made any proposals regarding the internal structure of APs with <u>too</u>. This will be taken up in §2.4. If the CP associated with <u>too</u> is adjoined to AP, the relevant portion of the structure in (50) would be as in (i).

i) John$_i$ is [$_{AP}$ [$_{AP}$ O_i' too [$_A$ proud of e_i']] [$_{CP}$ O_i for us to criticize e_i]]

The discussion in the text applies equally to this structure.

16. (47a) presents similar problems for the path theoretic approaches of both Kayne (1983) and Longobardi (1984). The Connectedness Condition is not able to rule out (47a) because in (50) the g-projection sets of the two empty categories connect. (47a) could be taken as support for the Scope Condition of Longobardi (1985), which essentially requires that the DS position of the parasitic gap be within the scope of the SS position of the licensing operator. This would require adopting a condition such as (46), however.

(51a) as an example, (51b) and (51c) illustrate two possible structures in which the operator O_i does c-command the parasitic operator O_i'.[17]

51) a. * John$_i$ is too proud of pictures of e_i for us to criticize e_i

b. John$_i$ is [$_{AP}$ O_i too [$_A$' proud of [$_{NP}$ O_i' pictures of e_i']] [$_{CP}$ t_i for us to criticize e_i]][18]

c. John$_i$ is [$_{AP}$ O_i [$_{AP}$ too [$_A$' proud of [$_{NP}$ O_i' pictures of e_i']] [$_{CP}$ t_i for us to criticize e_i]]]

Once again, if (51b,c) are possible structures, it is difficult to understand what would rule out the sentence (51a). The obvious problem with (47a) is that, since O_i' fails to meet the requirement of condition (46), e_i' is not bound by an operator. (47a) and (51a) also offer evidence that the

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17. Or if the structure is as in (i) of footnote 15, the modification looks as follows:

i) John$_i$ is [$_{AP}$ O_i [$_{AP}$ [$_{AP}$ O_i' too [$_A$ proud of e_i']] [$_{CP}$ t_i for us to criticize e_i]]]

Again, the text discussion applies to this structure as well as to that in (51).

18. The configuration

i) Op_i ... Op_i'... e_i'... e_i ...

where no member of the chain <Op_i',e_i'> c-commands e_i, cannot be to blame for the ungrammaticality of (1) since this is exactly the configuration which arises with subject parasitic gaps, such as (ii).

ii) a man that [close friends of e] admire e

predicational null operator, O_i, may not reside in an AP-adjoined or VP-adjoined position at SS.[19]

(46) cannot be interpreted as a condition on overt categories since Topicalization and Heavy NP Shift license parasitic gaps, as in (52).

52) a. I insulted t, by not recognizing e, my great uncle from Cleveland.
b. John, I insulted t by not recognizing e

NPs which have undergone Heavy NP Shift are not in SPEC of CP; nevertheless, they are able to bind and license variables.[20] The same is true for topics if they are adjoined to IP. In English, then, the following seems to be the minimal necessary characterization of "operator."

53) If α is an operator then (a) or (b).

a. α is overt and α is in an A′-position.
b. α is non-overt and α is in [SPEC,CP].

There are two things to point out about (53). Clause (53a) may be open to cross-linguistic variation if Cinque (1984) is right about Italian Clitic-Left Dislocation constructions; according to Cinque, only a (lexically determined) subset of lexical A′-elements are true operators. Secondly, it is important that (53) not be a biconditional since we must allow for

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19. This need not be a constraint against adjunction to these categories; even if null operators are allowed to reside in adjoined positions they will not function as operators by (46). Thus, no further constraint is needed.

20. However, Larson (in progress) and Lasnik (p.c.) propose analyses of HNPS which do not involve A′-movement.

the existence of empty categories in SPEC of CP which are not operators, i.e. intermediate traces.

While (46) may not be a condition on overt operators for the reasons just discussed, something must said to rule out (54), the equivalent of (44) with overt operators in place of the null operators.

54) a. * I consider John$_i$ [who$_i$ [a great admirer of e$_i$]]
b. * John$_i$ is/has become [who$_i$ [proud of e$_i$]]
c. * I consider John$_i$ [who$_i$ [proud of these pictures of e$_i$]]

In §2.2.1 I pointed out that (19b) obviated the role of the [+wh] feature in the derivation of relative clauses with overt operators. With (19b) in the grammar it is no longer necessary to motivate the movement of an overt relative operator to SPEC of CP by means of such a feature since the necessity of setting up an agreement chain to license the subject-predicate relation will serve this function. In (54), (19b) is satisfied, (46) does not apply and nevertheless the sentences are ungrammatical. One possibility for solving this problem is to differentiate between lexical operators and lexical A'-antecedents. The latter category includes topics and shifted heavy NPs and the former includes both interrogative and relative overt wh-operators. It would then be necessary to reformulate (46) as a condition on operators, as in (55).

55) α is an operator at level L iff α is in SPEC of CP at L.

The reformulation of (46) given in (55) requires a reformulation of the condition on variables briefly mentioned above (near (46)) along the lines of (56).

56) A variable must be bound by an A'-antecedent.

I assume that (56) holds for a variable at every level at which the variable occurs. In chapter three I will argue that (56) is (approximately) the correct formulation to of an identification condition on variables, but it should be clear that (55) and (56) are independent, i.e., in particular, that the validity of (56) does not hinge on that of (55).

There is another possible unified account of (44) and (54) which is not based on the proper definition of "operator".[21] The small clauses in (44) and (54) are of the form in (57), where X is either N or A.

57) ... NP_i $[_{XP}$ O_i [X ... e_i]] ...

The subject-predicate relation between NP_i and XP is licensed because NP_i receives the external θ-role of the head X. However, it is also licensed because NP_i agrees with the chain (O_i, e_i). It might be that such structures are ruled out precisely because both options in (19) are realized in one instance of predication; (55) could then be replaced by (58).

58) A subject-predicate relation may not simultaneously satisfy both clauses of (19).

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21. I am grateful to both N. Chomsky and T. Stowell for pointing out this possibility.

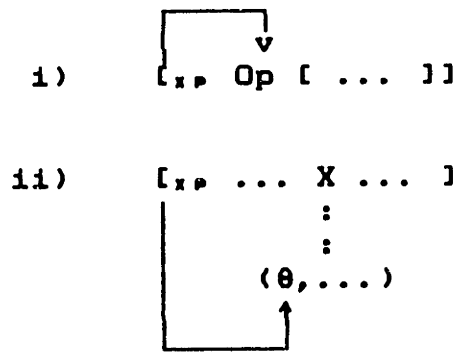
At the moment I know of no empirical basis for choosing between the two possibilities.[22]

2.3 Licensing Null Operators

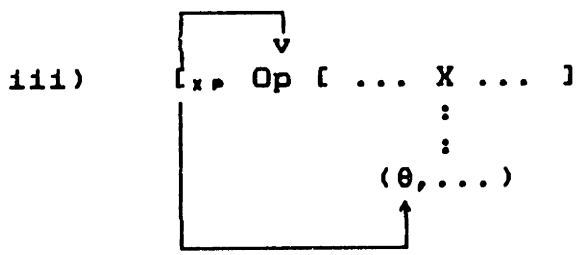
In this section I will show how (19), the subject-predicate constraint of §2.2, accounts for the distribution of null operators in particular. Taking purpose clauses as the first case study, it will be demonstrated that null operators

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22. There is an interesting account of the ungrammaticality of (44) and (54) available to a Williams-style analysis if the revisions I proposed in §2.2.1 are adopted. Recall that I suggested that vertical binding be considered to hold between the XP in (i) and the operator in the SPEC of XP as well as between the XP in (ii) and the θ-role it binds.



The configuration in (57) would, under this analysis, involve both sorts of vertical binding, as illustrated in (iii).



Extending "binding" to take into account the relation of vertical binding, a configuration such as (iii) could be ruled out by a slightly reformulated version of Safir's (1984) Parallelism Constraint on Binding.

are not responsible for the distribution, θ-properties or predicational properties of these clauses. Drawing mainly on Faraci (1974), and to a lesser extent on Jones (1985), I will show that PPs with non-clausal complements share the distribution and many of the properties of purpose clauses. An analysis of PPs similar to that in Rothstein (1983) is proposed which captures these similarities. Finally, I show how the condition on the subject-predicate relation, (19), interacts with the pro identification requirement to license null operators.

2.3.1 Types of Purpose Clauses

There are at least three clausal constructions which are often referred to as purposives or purpose clauses. In §2.2 I introduced a typology of purposives taken from Jones (1985) and exemplified in (59).

59) a. They brought John along [$_{RatC}$ (in order) to talk to him]
b. They brought John along [$_{SPC}$ to talk about himself to the students]
c. They brought John along [$_{OPC}$ to talk to]

These three constructions fall into two basic groups: rationale clauses (RatCs) and purpose clauses (PCs). RatCs appear with an optional subject gap. The two PCs are distinguished on the basis of where they have gaps: SPCs (Subject-gap PCs) obligatorily appear with only subject gaps, while OPCs (Object-gap PCs) obligatorily appear with object gaps and

optionally appear with subject gaps.[23] RatCs never appear with object gaps. A note on terminology: when I use the term "purposive clauses" I will be referring to all three types of clauses in (59). I will use "purpose clauses" or, more often, PCs to refer to the SPC/OPC pair.

Faraci (1974), in the first detailed study of these constructions, argues that RatC are VP-external while PCs are VP-internal. I will review briefly some of his arguments, along with some others from Jones (1985).

A) RatCs prepose freely, while PCs may not. Following Chomsky (1965), Faraci assumes that only phrases outside VP are preposable without topicalization intonation. (Examples in (A), (B), and (C) are from Faraci (1974).)

60) a. To protect herself, Mary hired a guard.
b. * To spend some time by himself, Ann sent Ned to NY.
c. * To practice on, John bought the piano.

Although Faraci stars prepcsed PCs, (60b) and (60c) are grammatical with topicalization intonation, i.e. stress on the PC.

B) PCs are more "dependent" semantically on the verb than RatCs. Faraci gives the following characterization of the conditions under which RatCs and PCs are licensed.

61) a. RatCs: volitional predicates, conditional predicates, and "some of the modals"; if a modal or conditional predicate is present, the volitionality of the matrix verb doesn't matter.

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23. Faraci (1974) calls (59a,b,c) respectively, rationale clauses, objective clauses and purpose clauses. I will adopt Jones's more perspicuous terminology.

b. OPCs: predicates of transaction (give, buy, sell, steal, take, borrow, lend); transitive verbs of motion (send, bring, take); verbs of creation (build, construct, devise, make); and the verb use.

c. SPCs: verbs of motion like send, bring and take.

The assumption is that the less dependent an element is on a head the farther from that head it will be base-generated; see Williams (1971, 1975).

C) When RatCs and PCs co-occur, (non-preposed) RatCs must follow PCs.

62) a. Marc bought Fido [$_{OPC}$ to play with] [$_{RatC}$ (in order) to please Anita]
b. * Marc bought Fido [$_{RatC}$ (in order) to please Anita] [$_{OPC}$ to play with]

63) a. Ben took Alice to Boston [$_{SPC}$ to amuse herself] [$_{RatC}$ to please himself]
b. * Ben took Alice to Boston [$_{RatC}$ to please himself] [$_{OPC}$ to amuse herself]

This is straightforwardly explained if RatCs are VP-external and PCs are VP-internal.

Jones (1985) points out the following additional differences between RatCs and PCs in support of the VP-external/VP-internal distinction.

D) PCs cannot be stranded by VP-deletion, VP-preposing or in <u>though</u> constructions.

64) a. ? John bought <u>Moby Dick</u> to read and Fred did, too, to keep on his shelf
b. ? His mother sent John to pick up the laundry and then his father did, too, to buy some pizza
c. John dove from the cliff in order to impress Mary and then Fred did, too, in order to get away from her.

65) a. * John said he'd buy it to read and buy it he did, to read.
b. * John's mother said she'd send him out to pick up the laundry and send him out she did, to pick up the laundry.
c. ? John said he'd jump off the cliff in order to impress Mary and jump off the cliff he did, in order to impress Mary.

66) a. * Buy it though John may to read, he'll never get past the first chapter.
b. * Send John out though Mom may to pick up the laundry, he'll never make it past the corner bar.
c. Dive off the cliff though John may in order to impress Mary, he'll still never be as handsome as Bob.

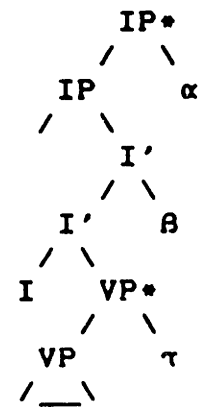
(Judgements are given as they appear in Jones (1985). For me, (64a) and (64b) are as bad as the (a) and (b) sentences of (65) and (66). This does not weaken the point made by these examples, but rather strengthens it.)

E) PC cannot be stranded (or dependent on <u>do</u>) in pseudoclefts, while RatC can.

67) a. * What John did to read was buy it.
b. * What Mom did to pick up the laundry was send John.
c. What John did in order to impress Mary was dive off the cliff.

The data in (A) - (E) offer rather convincing support for regarding PCs as VP-internal adjuncts. Faraci and Jones also conclude from their evidence that RatCs are VP-external. If "VP-external" can be taken to include "VP-adjoined", then the evidence above does not distinguish between the three positions α, β, and τ as attachment sites for RatCs.

68)



The conclusion that RatCs are VP-external is based on their ability to be stranded by VP-preposing, though-movement and pseudoclefting, but, as shown in (69), RatCs may also be included with VP-internal material in these constructions.

69) a. John said he'd jump off the cliff in order to impress Mary and jump off the cliff in order to impress Mary he did.
b. Dive off the cliff in order to impress Mary though John may, he'll still never be as handsome as Bob.
c. What John did was dive off the cliff in order to impress Mary.

The grammaticality of (69) apparently contradicts the evidence presented above, which was taken to suggest that RatCs were VP-external constituents. There are, no doubt, several possible solutions to this paradox; I will adopt the position that τ, the VP-adjoined position in (68), is the correct attachment site for RatCs and that the processes forming the constructions in (69) may affect either VP or VP* given a structure such as that in (68).

I have been assuming, as did Faraci, that all three types of purposives are full clauses. Jones, in contrast, argues that, while SPCs and RatCs are clausal, OPCs are bare

VPs. His argument for the bare-VP hypothesis is based in part on his assertion that OPCs never appear with overt subjects. The next section offers arguments against this assumption.

2.3.2 OPC Subjects

Jones offers three pieces of evidence for the position that <u>for + NP</u> in (70)

70) John bought it <u>for Mary</u> to read e*[24]

must be analysed as a PP, rather than a complementizer + subject sequence. First, a PP may appear independently of the purpose clause, as illustrated in (71a). Secondly, it is preposable, as in (71b). Finally, the NP which is interpreted as the subject of the embedded verb may appear in PPs which are not headed by <u>for</u>, as illustrated in (72). (All examples are from Jones (1985), ch. 2.)

71) a. I bought it [for John]
b. [For John], I bought it to look at himself in e

72) a. I pushed it over to John [to use e on his hamburger]
b. We gave it to John [to put e on his trophy shelf]
c. I left it with John [to use e as he pleases]
d. We sent it rolling toward John [to train his gun-sights on e]

Jones notes that there is a problem with his position that all <u>for + NP</u> sequences which appear with purpose clauses are inde-

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24. Hereafter, I will sometimes omit the null operator in order to simplify representations; this is for aesthetic rather than theoretical reasons.

pendent PPs, namely, that in certain cases the alleged PP and the purpose clause act as a constituent. For example, for + NP and the purpose clause can appear as the focus of a cleft.

73) a. He bought the piano for Jane to practice on e
b. It was for Jane to practice on that he bought the piano.

74) * It was with John to use as he pleases that we left it.

When the preposition/complementizer ambiguity does not arise and the PP in question clearly does not form a constituent with the purpose clause, the PP + purpose clause string may not be clefted, as shown in (74).

Purpose clauses present us with contradictory evidence as to the nature of the for + NP sequence with which they are sometimes introduced. Jones resolves the contradiction by arguing that OPCs are bare VPs which never have lexical subjects. He must then resort to a special rule which creates a constituent of a PP and VP under just the above circumstances in order to explain the constituency of the alleged PP and bare VP in (73). A less ad hoc approach is available if we assume that the for + NP sequence in (70) has properties of both an independent PP and a complementizer + subject sequence precisely because it may be analysed as either one.

Naturally, there are structures involving purpose clauses in which for + NP is clearly not a complementizer + subject sequance, e.g. (71b). The Extended Projection Principle requires that (71b) have the SS representation in (75). (Note that the presence of the null operator binding the

object gap has no bearing on the question of whether the purpose clause has a subject.)

75) [for John] I bought it [Op [PRO to look at himself in e]

The data in (71) do not show that that clausal constructions which appear with separable PPs and no lexical subject are bare VPs. (71b) is consistent with both the bare VP and the full clause approach. Moreover, there are other cases which exhibit the alternation shown by purpose clauses. Consider the case of sentential subjects, as shown in (76).

76) a. [for John to lose the race] would be awful
b. [for John$_i$ to lose the race] would be awful [for him$_i$]
c. [to lose the race] would be awful [for John$_i$]
d. * [for John$_i$] I bought it [for him$_i$]

That (76b) is not simply a preposed PP preceding a sentential subject can be seen by comparing (76c) and (76d).[25] The lesson to be drawn from (76) is that the alternation between (76a) and (76c), comparable to that between (70) and (71b), does not entail that all clauses which appear with separable <u>for + NP</u> sequences must be analysed as bare VPs.

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25. There is a left-dislocated reading of (76a) which probably has the structure a PP preceding a sentential subject, as shown in (i).

i) [$_{PP}$ for John] [$_{CP}$ PRO to lose the race] would be awful

The reading is something like "as for John, ..." and is completely distinct from the natural reading of (76b).

Now consider the following sentences, where α marks the original position of the preposed PP.[26]

77) a. John bought it for Mary for the kids to play with
b. For Mary, John bought it α for the kids to play with
c. * For the kids, John bought it for Mary α to play with

(77c) is ungrammatical with the kids as subject of play. Apparently, when two for + NP sequences are present, only the first may be preposed. Similarly, only the first may be wh-moved.

78) [For whom]$_j$ did John buy a dog$_i$ t$_j$ for the kids to play with e$_i$

79) * [For whom]$_j$ did John buy a dog$_i$ for Mary t$_j$ to play with e$_i$

Note also that for + NP may co-occur with any of the independent PPs noted in (72).

80) a. I pushed it over to John for him to use e on his hamburger
b. We gave it to John for him to put e on his trophy shelf
c. I left it with John for him to use e as he pleases
d. We sent it rolling toward John for him to train his gunsights on e

In some cases as many as three for + NP sequences may occur in a sentence.

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26. I have resorted to the use of α to indicate the original position of the preposed PP as I do not wish to take a position at this time on whether preposing leaves a trace in all cases.

81) For Mary, I bought it for John for his kids to play with e

The movable PP in (77), (78) and (81), and in general, is the benefactive, i.e. the interpretation of the preposed PP in (81) is "to please Mary/for Mary's sake..." The next PP (for John) is the goal and in the final for + NP sequence the kids is, apparently, the agent of play. Oddly enough, three for + NP sequences can appear even without the purposive clause.

82) a. I bought it for John for Mary.
b. For Mary, I bought it for John.
c. ? For Mary, I bought it for John for his kids.

While (82c) seems less than felicitous, it is not totally ungrammatical.[27] Note however, that the semantic role of the kids is different in (81) and (82c). In (81) the kids is pretty clearly the agent of play. In (82c) there is no verb for it to be the agent of. Rather, it seems to function as a sort of secondary goal, giving the sentence the interpretation in (83), where the parenthesized material roughly paraphrases the semantic content of each for in (82c).

83) (To please) Mary, I bought it (to give to) John (to give to) the kids.

If my hypothesis that for + NP in a purpose clause may sometimes be a complementizer + subject sequence is true, then we

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27. I find that (82c) improves with a slight pause before the final PP, indicating that it may be a kind of afterthought addition. This pause is not apparent when the third for + NP is part of a purpose clause. This provides further support for my hypothesis.

should be able to get one more for + NP in a sentence with a purpose clause than we can in a sentence without such a clause. Since three for + NPs are marginally grammatical in (82c), we should be able to get four such sequences by adding a purpose clause and not cause any further decline in grammaticality. While (84a) is not perfect, it is certainly better than (84b) and, I believe, on a par with (82c).

84) a. ? For Mary, I bought it for John for the kids for their friends to play with e
b. * For Mary, I bought it for John for the kids for their friends.

Finally, the relative grammaticality of (85a) as compared with (85b)

85) a. It was for the kids to play with e that I bought it for John.
b. * It was to play with e that I bought it for John for the kids.

supports the hypothesis that in some cases the for + NP sequence which immediately precedes the purpose clause verb is actually a complementizer + subject sequence, rather than a PP.

2.3.3 Control in RatCs and PCs

It has often been noted that the links between matrix NPs and the various gaps in RatCs and PCs appear to be thematically governed. When RatCs do not have lexical subjects their PRO subjects must be controlled by the matrix agent.

86) a. John gave Mary a car in order to ingratiate himself with her friends.
b. * John gave Mary a car in order to ingratiate herself with her friends.

The sentences in (87) indicate that the operative notion is indeed agency and not structural subject.

87) a. The bridge was blown up (by the guerillas) in order to demonstrate the power of the resistance.
b. * The ship sank in order to demonstrate the power of the resistance.

(87a) is grammatical even without the by-phrase, indicating that "implicit" arguments (see Roeper (1987) and references for discussion) may control the subject of RatCs. As was noted above, RatCs never appear with object gaps, i.e. host null operator chains.

88) * John$_i$ bought a new car$_j$ [in order PRO$_i$ to drive e$_j$ all over town]

Though both Jones and Faraci treat RatCs with lexical subjects as fully grammatical, they seem quite marginal to me. The deviance is particularly noticeable when the clause is not introduced by in order.

89) a.?? John stuffed the ballot box in order for his son to win the election.
b.?* John stuffed the ballot box for his son to win the election.

It is important for Jones that RatCs be regarded as having a free alternation between overt and null subjects as he does not wish to characterize them as structures of obligatory

control.[28] This distinction does not play a role in my analysis so, in light of the differences in judgement, I will generally ignore this potentially significant fact.

There are two thematic or semantic requirements governing the choice of NP which may control the SPC subject or antecede the OPC object gap. In both cases the NP must be a THEME, in the sense of Gruber (1965) and Jackendoff (1972, 1974, 1976).

90) a. * John told Mary$_i$ a joke [PRO$_i$ to repeat it to Bill]
b. * Mary$_i$ bought a new car [for us to envy e$_i$]
c. * I sent Mary$_i$ a student$_j$ [PRO$_j$ to annoy e$_i$]

a.′ John told Mary a joke$_i$ [PRO$_j$ to repeat e$_i$ to Bill]
b.′ Mary bought a new car$_i$ [for us to admire e$_i$]
c.′ I sent him$_i$ to Mary$_j$ [PRO$_j$ to advise e$_i$]

Moreover, as Faraci noticed, not all THEMEs are appropriate controllers or antecedents.

91) a. * John$_i$ burned the evidence$_j$ [PRO$_i$ to get rid of e$_j$]
b. * John buried some jewels$_j$ for Mary$_i$ [PRO$_i$ to hide e$_j$]
c. * John$_i$ displayed it$_j$/a pan$_j$ [PRO$_i$ to fry eggs in e$_j$]

92) a. * John burned the evidence$_i$ [PRO$_i$ to disappear]
b. * John buried some jewels$_i$ [PRO$_i$ to come in handy on a rainy day]
c. * John displayed it$_i$/a car$_i$ [PRO$_i$ to impress the undergraduates]

Jones and Faraci characterize the class of appropriate THEMEs as those which are somehow "available" to participate in

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28. For Jones S′, the category which he assumes RatCs to be, is opaque to obligatory control. See his chapter 2, sec. 3.1.1 for discussion.

further action. This notion of availability is rather delicate, illustrated by the contrast in (93).

93) a. * John took apart a chair$_i$ [to get rid of e$_i$]
b. ? John took apart a chair$_i$ [to build a fire with e$_i$]

After being taken apart, surely the chair no longer exists as such, yet (93b) is only slightly marginal. Consider also the examples in (94), from Faraci.

94) a. Harold painted the stove [to cook his meals in]
b. Harold cleaned the stove [to cook his meals in]

Unlike the verbs in (92), <u>paint</u> and <u>clean</u> denote activities which leave their objects apparent and in existence. However, Faraci stars both of these sentences. While they are admittedly not perfect, they seem to me rather acceptable. The versions in (95) are even better than those in (94).

95) a. He painted a chair$_i$/it$_i$ [to sit on e$_i$ at his desk]
b. He cleaned this pot$_i$/it$_i$ out [to cook his soup in e$_i$]

I have no insight into the proper characterization of this "availability" at this time.

The possibilities for control of OPC subjects are also affected by the availability condition. In (96a) the matrix subject controls the OPC subject, while in (96b) and (96c) the matrix goal controls the OPC subject.

96) a. John$_i$ bought a piano$_j$/it$_j$ [PRO$_i$ to practice on e$_j$]
b. John bought a piano$_j$/it$_j$ for Mary$_i$ [PRO$_i$ to practice on e$_j$]

c. John bought Mary$_i$ a piano$_j$ [PRO$_i$ to practice on e$_j$]

In (96) the controller of the OPC subject is also, in a different sense, the "controller" of the piano, i.e. the person for whom it is available by virtue of the action denoted by the matrix verb. When the indirect object is SOURCE, the matrix subject (which is now GOAL) controls the OPC subject.

97) John$_i$ bought a piano$_j$ from Mary$_k$ [PRO$_{i/*k}$ to practice on e$_j$]

If we call control of the subject of the SPC and antecedence of the object gap in OPC the "primary links" for each of these PCs, then the generalization can be roughly stated as follows: the primary link for a PC is to THEME; any secondary link (e.g. control of OPC subject) is to GOAL. Jones encodes this generalization as a thematic hierarchy, such as that proposed by Chierchia (1984) and Nishigauchi (1984), which derives from that proposed by Jackendoff (1972).[29]

98) Thematic Hierarchy: THEME > GOAL > SOURCE/LOCATION ...

Structural, rather than thematic, analyses of this phenomenon are possible. It could, for example, be argued that <u>from</u>, but not <u>to</u> or <u>for</u>, prevents its object from c-commanding into the

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29. The relevance for PCs of the SOURCE/LOCATION level in the hierarchy is not obvious to me, as those θ-roles never control empty categories in PCs. For the analysis of purpose clauses, the Thematic Hierarchy is simply a stipulation that the subject of SPCs and the object of OPCs link to THEMEs, while the subject of OPCs links to GOAL.

OPC (under the assumption that c-command is the necessary condition for control in these cases). This is particularly plausible given that to and for are two of the prepositions which were co-opted as case-markers in the transition to Middle English (see Lumsden (in progress)). They might therefore be regarded as realizations of oblique case in NP rather than heads of independent maximal projections, as proposed by K. Hale. If the mapping from thematic relations to structural relations is fixed, as argued by Baker (1985) and Belletti & Rizzi (1986), then the structural argument is probably reducible to a thematic argument.

The above characterization of OPCs and SPCs (essentially that of both Faraci and Jones) implies that the two are distinct entities. This, I think, is not so obvious. While the lack of an object gap in SPCs strongly differentiates them from OPCs, there are reasons to think the two are more closely related than SPCs and RatCs are. Notice that the verbs which support SPCs are a subset of those which support OPCs. The relevant portions of (61) are repeated below.

61) b. OPCs: predicates of transaction (give, buy, sell, steal, take, borrow, lend); transitive verbs of motion (send, bring, take); verbs of creation (build, construct, devise, make); and the verb use.

c. SPCs: verbs of motion like send, bring and take.

However, the list of verbs in (61c) appears to be incomplete. If the defining characteristics of SPCs are (i) they appear with only a subject gap and not an object gap and (ii) the

subject gap is controlled by a matrix THEME, then the PCs in (99) are surely SPCs.

99) a. Mary bought a dog$_i$/it$_i$ [PRO$_i$ to guard her house]
b. I gave a dog$_i$/it$_i$ to Mary [PRO$_i$ to guard her house]
c. Mary stole a pine$_i$ from his forest [PRO$_i$ to serve as our Christmas tree]
d. Mary lent her spats$_i$ to John [PRO$_i$ to liven up his wardrobe]
e. Mary borrowed some spats$_i$ from John [PRO$_i$ to liven up her wardrobe]
f. Mary built a birdhouse$_i$/it$_i$ [PRO$_i$ to hang in the oak tree]
g. Mary constructed a gate$_i$/it$_i$ [PRO$_i$ to fit the gap in the fence]

Furthermore, while RatCs may coocur with either OPCs or SPCs (see (62) and (63) above), the latter two never appear together.

100) a. * Mary sent her son to the nuns [to educate e] [to improve himself]
b. * Mary sent her son to the nuns [to improve himself] [to educate e]

There does seem to be a difference between SPCs and OPCs which deserves attention: some SPCs are not compatible with dative shift structures. It has been suggested that this is a defining characteristic of SPCs (one which distinguishes them from OPCs in particular) and that the phenomenon derives from a requirement that the THEME controller of an SPC be invested with a kind of secondary agency by the matrix predicate.[30] The effects of this phenomenon can be easily seen with the verb

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30. Faraci discusses this at length; Barbara Partee is also credited with having pointed this out by both Jones and Nishigauchi (1984).

send which allows its to-phrase to be either a dative or directional phrase. SPCs can appear with send, but not freely: when the to-phrase is a dative, SPCs are incompatible.

101) a. John sent his son$_i$ to the librarian PRO$_i$ to get some help.
b. J sent his son$_i$ to the librarian PRO$_i$ to be properly trained.

102) a. * John sent the librarian his son$_i$ PRO$_i$ to get some help.
b. * J sent the librarian his son$_i$ PRO$_i$ to be properly trained.

Dative shift makes it impossible to interpret the librarian as a directional phrase and ungrammaticality results. The grammaticality of dative shift structures with OPCs, (103), indicates that the ungrammaticality of (102) is not due to some problem with the availability of the THEME.

103) a. John sent the librarian$_i$ his son$_j$ PRO$_i$ to train e$_j$
b. John sent the librarian$_i$ these books$_j$ PRO$_i$ to catalog e$_j$

This difference between SPCs and OPCs could be accounted for as follows: in the non-dative shifted structure send assigns the direct object (THEME) the additional role of secondary agent.[31] This secondary θ-role is not assigned to the THEME in the dative-shifted structure.[32] Assume finally that only an

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31. This is not implausible if, as suggested in Kegl (1984) and elsewhere, roles like AGENT and PATIENT are part of a system distinct from that comprised of THEME, GOAL, SOURCE, etc.

32. These proposals have interesting consequences for the structure of double object verbs given Baker's (1985) Uniform Theta-Assignment Hypothesis (UTAH). According to UTAH, one and only one DS representation is associated with a particular set

argument that is itself agentive may control a fully agentive PRO. This account doesn't really hold up given the grammaticality of (104) and the examples in (99a,b,d), most of which involve non-animate controllers and an embedded agentive subject.

104) I sent my spats$_i$ to John PRO$_i$ to liven up his wardrobe

In fact, there are even some dative shifted sentences with send which seem to allow SPCs. (The direct object in (105b) is given as an infinitival relative to force the PC reading for the final clause; the usual tactic of substituting a pronoun for the full NP will not work in this context for familiar reasons.)

105) a. I sent the librarian my son$_i$ [PRO$_i$ to serve as her assistant]
b. I sent John [a rack to hang coats on]$_i$ [PRO$_i$ to stand in the front hallway]

I would like to suggest that the trichotomy SPC-OPC-RatC does not sufficiently characterize the types of purposives that exist. A more complete typology includes, besides RatCs, the following three clausal purposives: AGENT-oriented subject-gap PC, THEME-oriented subject-gap PC, and THEME-oriented object-gap PC. Examples of each type from the discussion above are repeated below.

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of θ-relations. If the θ-relations which exist in the dative shifted and non-dative shifted versions of send VPs are distinct, then we would expect the DS representations for these structures to be distinct.

101) a. John sent his son$_i$ to the librarian PRO$_i$ to get some help.
(cf. "John$_i$ sent the librarian his son$_j$ in order PRO$_{i/*j}$ to get some help")

105) b. I sent John [a rack to hang coats on]$_i$ [PRO$_i$ to stand in the front hallway]

103) b. John sent the librarian$_i$ these books$_j$ PRO$_i$ to catalog e$_j$

Notice that the AGENT-oriented subject-gap PC is not a RatC, as evidenced by its ungrammaticality with in order to. For typographical ease I will use the subscripted acronyms SPC$_A$ and SPC$_T$ to refer to AGENT and THEME-oriented subject-gap PCs, respectively. It should now be apparent that the analysis sketched in the paragraph after example (103) is relevant to SPC$_A$s but not SPC$_T$s. Before attempting a more complete analysis of the four purposive clauses, it is necessary to compare the behavior of purposive PPs.

2.3.4 PPs: Distribution and Control

There is an important, but little discussed, fact about purposive clauses which was first pointed out by Faraci: the distribution of these clauses and the control facts just outlined (including "control" of the object gap in OPCs) are mirrored by the distribution and interpretation of purposive PPs. Except where noted, the arguments and data which appear in this section to illustrate this correspondence are based on Faraci (1974); my final analysis of the correspondence differs from his significantly. There are three points to be made: (1)

there are non-clausal for-PPs which have the same interpretations as purposive clauses; (2) these PPs have the same distribution as their clausal counterparts (cf. §2.3.1); (3) they have the same "control" properties as their clausal counterparts (cf. §2.3.3).

Consider first the pair of sentences in (106).

106) a. Mort$_i$ sent his robot$_j$ to us [PRO$_{i/j}$ to get the prize]
b. Mort$_i$ sent his robot$_j$ to us [for the prize]

The clause in (106a) may be interpreted as either a RatC (with matrix subject control) or an SPC$_A$ (with matrix object control). Both readings are available for the PP in (106b) as well.[33] The same similarities are perhaps more clearly visible in pseudoclefted constructions. Recall that RatCs alone may be stranded in pseudoclefts. In the paradigm in (107) we can then identify (107c) as a RatC and (107b) as an SPC$_T$.[34]

107) a. John built a robot to entertain his guests.

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33. In fact, a third possible reading: "Mort sent us his robot as a prize" is also available for (106b). The difference between this reading and the one which corresponds to the SPC reading of the infinitive is the same as the difference between (i) and (ii).

i) John brought Mary home for dinner.
ii) John brought pizza home for dinner.

I assume that the difference may be adequately characterized in terms of the θ-role which the PP assigns to the NP which is, essentially, its external argument: Mary in (i) and pizza in (ii).

34. Optionally, the infinitive in (107c) and the PP in (108c) may both be interpreted as rationale phrases.

b. What John built to entertain his guests was a robot.
c. What John did to entertain his guests was build a robot.

When the infinitives are replaced with purposive PPs, pseudo-clefting disambiguates the sentence in exactly the same manner.

108) a. John built a robot for entertainment.
b. What John built for entertainment was a robot.
c. What John did for entertainment was build a robot.

In both (107b) and (108b) the source of the entertainment (for either John or his guests) is the robot itself. In (107c) and (108c) the source of entertainment is the act (or event) of building the robot. Many more such examples may be constructed; see Faraci's chapter 2 for extensive discussion.

Other parallels exist between purposive clauses and PPs; for example, when a PP is preposed, only the rationale reading is available without topicalization intonation (see the discussion of (60) above).

109) a. To entertain his guests, John built a robot.
b. For entertainment, John built a robot.

More importantly, purposive PPs occur with just those verbs which support their clausal counterparts. Faraci's examples are below.

110) a. John (*accidentally) let the cat out of the room for some peace and quiet.
b. * Bill was short for maximal effectiveness.
c. Bill must be short for maximal effectiveness.
d. Bill needs to be short for maximal effectiveness.

e. It is sufficient for Bill to be short for maximal effectiveness.

In (110a) the adverb renders the action non-volitional and therefore incompatible with a rationale PP. The volitionality which is missing in (110b) is supplied by the modal and conditional predicates in (110c,d,e). The verbs which support PCs also support their non-clausal counterparts, as illustrated by the paradigms below.

111) a. Mary built/bought the board for her chess game.
b. Mary built/bought the board for Spassky to play on.

112) a. Harold made/used the stove for his gourmet cooking.
b. Harold made/used the stove (for his chef) to cook on.

113) a. ?? Mary destroyed the board for the bonfire she was making.
b. ?? Mary destroyed the board for the scouts to burn.

114) a. ?? Mary repaired the board for her chess games.
b. ?? Mary repaired the board for Spassky to play on.

115) a. ?? Harold painted/cleaned the stove for his gourmet cooking.
b. ?? Harold painted/cleaned the stove (for his chef) to cook on.

116) a. John's parents sent him to Stanford for an education.
b. John's parents sent him to Stanford to get an education.

Faraci notes that the (a) examples in (113) - (115) are acceptable under a non-purposive reading which might be translated as "in preparation for".

Like RatCs and PCs, rationale PPs and purpose PPs are ordered with respect to each other. ((117) is from Faraci.)

117) a. Harold used his stove for his gourmet cooking for the thrill of it.
b. * Harold used his stove for the thrill of it for his gourmet cooking.

118) a. John sent his kids to the grocery store for potato chips and ice cream for a little peace and quiet.
b. * John sent his kids to the grocery store for a little peace and quiet for potato chips and ice cream.

The control facts discussed in §2.2.3 also have their analog in the interpretation of purposive PPs. Recall that a matrix subject could control the subject of an OPC only in case there was no goal argument within the VP. This was illustrated in (96), repeated below.

96) a. John$_i$ bought a piano$_j$/it$_j$ [PRO$_i$ to practice on e$_j$]
b. John bought a piano$_j$/it$_j$ for Mary$_i$ [PRO$_i$ to practice on e$_j$]
c. John bought Mary$_i$ a piano$_j$ [PRO$_i$ to practice on e$_j$]

In (96b,c) it is impossible to interpret the PRO as controlled by John. Now consider the sentences in (119).

119) a. Mary bought her daughter a set of rosary beads for penance.
b. Mary bought a set of rosary beads for penance.

In both (119a) and (119b) the PP can be interpreted as a rationale phrase: the purpose of the act of buying was penance. On this interpretation the penitent is Mary in both sentences. The PP in both cases may also be interpreted as a purpose phrase (analog of OPC): the rosary beads are to be used during the act of penance. With this reading of the PP,

the penitent in (119a) is the daughter, while in (119b) it is Mary. That is, the same "control" facts hold in purposive PPs and in purposive clauses. The same fact is illustrated in a slightly different manner by the sentences in (120), which should be compared with those in (121).

120) a. John borrowed a tent from Max for camping trips.
b. John loaned a tent to Max for camping trips.

121) a. John$_i$ borrowed a tent from Max [PRO$_i$ to take e to Montana]
b. John loaned a tent to Max$_i$ [PRO$_i$ to take e to Montana]

As noted above, a SOURCE argument does not preempt matrix subject control as a GOAL argument does.

Finally, the well-known example in (122) indicates that with a verb which is ambiguously transitive and intransitive the PC is ambiguous between an OPC and SPC$_T$.

122) John brought the chicken home to eat.

In this sentence the chicken may have been brought home as either the guest of honor or the main dish. The two readings correspond, respectively, to (123a) and (123b).

123) a. ... the chicken$_i$ ... [[PRO$_i$ to eat]]
b. ... the chicken$_i$ ... [Op$_i$ [PRO$_j$ to eat e$_i$]]

124) John brought the chicken home for dinner.

The same ambiguity is present in (124), where the infinitive is replaced by a purposive PP.

2.3.5 Predication, Purposives and PPs

The correspondence between purposive clauses and purposive PPs, in distribution, interpretation and "control", seems evident. Faraci's approach to accounting for this correspondence is to propose that all purposives are in fact prepositional phrases with clausal complements of a prepositional head. This seems reasonable for <u>in order to</u> RatCs where the possibility of the sequence <u>in order for NP</u> indicates the need for a prepositional head as well as a complementizer. Faraci's evidence for extending this analysis to PCs, besides the similarities between PCs and PPs reviewed in the preceding section, comes from pseudocleft and cleft constructions. When PCs are pseudoclefted, they may appear with a stranded preposition, (125a). Notice that the stranded <u>for</u> also appears when there is a complementizer with the clause in focus position, (125b).

125) a. What Carol bought a rack for was to hang coats on.
b. What Carol bought a rack for was for John to hang his clothes on.

Unlike Faraci, I take this data as further evidence for the interpretational similarity between PPs and PCs rather than evidence that PCs <u>are</u> PPs. <u>What</u> in a pseudocleft corresponds only to focus constituents which are NP arguments, clausal arguments and adjectival predicates.

126) a. What I saw was a dog.
b. What I heard was that you were leaving.
c. What I consider John is foolish.

127) a. * What I live is in Somerville.
b. * What I put it was there.
c. * What I left was Tuesday.
d. * What I fixed the car was with a hammer.

(127b,c) indicate that what may not even correspond to bare-NP adverbs (Larson (1985)). The relative acceptability of (128) indicates that adjuncts may be clefted, regardless of category, when the appropriate wh-phrase appears in the non-focus clause.

128) a. ? Where I live is in Somerville.
b. ? Where I put it was there.
c. ? When I left was Tuesday.
d. ? How I fixed the car was with a hammer.

(The marginality of (128) is probably due to the general deviance of pseudoclefts with wh-phrases other than what.) Following Larson, the sentences in (128) are grammatical because the wh-phrases have the case-marking properties necessary to license their variables. What arguably does not have these properties and, when it is base-generated in an adjunct position, will leave a non-case-marked variable. Thus when the focus constituent is an adjunct what may only appear as the object of a stranded prepostion, a case-marked position. The correspondence between purposive PPs and PCs allows a categorial mismatch, along the lines of that in (126b).[35]

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35. The same point is made regarding sentential complements of the verb hope in Brame (1980), where examples from Stockwell, Schachter & Partee (1968/73), Akmajian (1970) and Kajita (1972) which illustrate the categorial mismatch allowed in pseudoclefts are repeated.

Faraci also points out that sentential complements do not cleft, while purpose clauses may.

129) a. John intended for Mary to leave late.
b. * It was for Mary to leave late that John intended.

130) a. Sally bought the piano (for Todd) to practice on.
b. It was (for Todd) to practice on that Sally bought the piano.

This he also attributes to the categorial status of the purpose clause as a PP. As additional evidence he gives sentences such as those in (131), which contrast with those in (129) in their relative grammaticality as clefts.

131) a. I was hoping/waiting for Mary to arrive.
b. It was for Mary to arrive that I was hoping for.

132) I was hoping/waiting for a solution to the problem.

He attributes the grammaticality of (131b) to the status of the complement as a PP with a clausal object. As shown in (132), these verbs do take PP complements. The status of <u>for</u> in clausal constituents has long been debated in the literature.[36] The crucial question for this discussion is whether the <u>for</u> which appears with infinitival clauses is a complementizer (i.e., head of CP) or a preposition (i.e., head of PP). At this point I will restrict the discussion to purpose

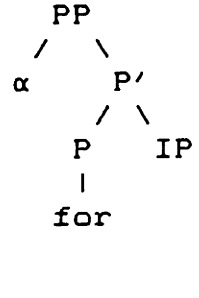
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36. See Bresnan (1970), Chomsky & Lasnik (1977), Chomsky (1980), Brame (1980) and the references in the previous footnote.

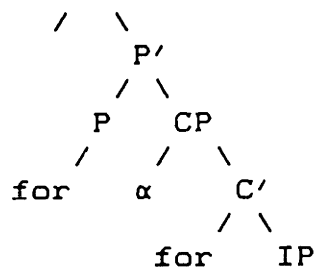
clauses leaving aside the questions raised by the data in (129) - (132).[37]

If we assume that purpose clauses are PPs, as Faraci argues, there are two structures that could be assigned to them depending on whether one assumes that the prepositional head takes an IP complement or a CP complement. The two options are in (133); α marks the position of a null operator in the case of OPCs.

133) a.



b.



Consider (133a) first. In §2.2 two proposals were discussed which would have the effect of ruling out sentences such as (134a) with the configuration in (134b).

134) a. * I consider John$_i$ [proud of e$_i$]
b. ... NP$_i$ [XP$_i$ O$_i$ [X ... e$_i$]] ...

The two proposals, given in (46) and (58) in §2.2, are repeated below.

46) An empty category is an operator only if it is in the SPEC of CP.

58) A subject-predicate relation may not simultaneously satisfy both clauses of (19).

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37. See Heggie (1986) for a different analysis of clefts.

19) A subject-predicate relation is licensed if

a. the subject discharges the external θ-role of the predicate or
b. the subject agrees with a chain contained in the predicate.

(46) rules out (133a) as a possible representation for OPCs since the empty category in the position of α would not, by definition, be an operator and the variable within IP would not be operator-bound.[38] Is (133a) a possible representation for OPCs if (46) is rejected in favor of (58)? Answering this question requires a brief discussion of the predicational and thematic properties of PPs in general.

I adopt essentially Rothstein's (1983) view of PPs as predicates. A preposition names a two-place relation, the second position of which is filled by the prepositional object. The external argument or subject of the preposition is designated as participating in the relation so defined. Rothstein assumes that the relation between the preposition and its external argument is weaker than external θ-role assignment, the relation which holds between a verb and its exrternal argument.

The subject of a preposition can be either an NP, as in "John gave a book to Mary", or the E(vent)-position of a predicate. Developing and extending an idea of Davidson's (1966),

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38. If the SPECs of NP (DP) and AP are A-positions then the constraint on where empty categories can be null operators would reduce to the A/A' distinction. This would allow the adoption of (133a) if it could be shown that the SPEC of PP is not an A-position.

Higginbotham (1983, 1985, 1986) proposes that both active and stative predicates contain E-positions in their θ-grids (see Stowell (1981)) which are available for predication. According to Higginbotham, the lexical entry of a verb like walk is as in (135a); the E-position is discharged via existential generalization giving giving the interpretation (135c) for (135b).

135) a. 'walk', (+V,-N), <1,E>, Actor(1)
b. John walks.
c. (∃e) [walk (John,e)]

Finally, PPs which are predicated of E-positions are interpreted as in (136). All examples are from Higginbotham (1986); for definitions and discussion of the execution and ramifications of these proposals, see the references above. In all examples the contribution of tense to the interpretation is ignored.)

136) a. John fell down after Bill hit him.
b. (∃e) [fell down(John,e) & after(e, (the e′) hit(Bill,John,e′))]

Higginbotham assumes that the PP in (136a) is predicated of the E-position in the verb. Rothstein, however, regards the event, which she places in INFL, as an argument of the verb on a par with its lexical arguments. PPs such as that in (136) are, for her, predicated of INFL. Evidence for choosing between the two might come from syntactic tests which determine the location of the PP, i.e. VP-external vs. VP-internal. The tests performed on RatCs, which I take to be predicated of events, in §2.3.1 indicate that they are not VP-internal ele-

ments. The sentences in (137) and (138) indicate that prepositions such as after and without are also not VP-internal.

137) a. ... and complain he did after I had criticized him.
b. ... and shoot you he would without even blinking.

138) a. Bill complains after I criticize him and John does after I compliment him.
b. Bill flies without a copilot but John does without a parachute.

However, as noted in §2.3.1, there are reasons to believe that RatCs are base-generated in a VP-adjoined position; the sentences in (139) indicate that the same is true for PP adjuncts such as those in (137) and (138).

139) a. ... and complain after I had criticized him he did.
b. What John did was fly to Boston without a copilot.
c. Fly to Boston without a copilot though you may, it will not mean that you are a competent pilot.

Depending on how one formulates the locality condition on the subject-predicate relation, assuming that predicates of the E-position are VP-adjoined seems to be compatible with both Rothstein's approach and Higginbotham's. The position of the adjunct gives no evidence for choosing between the two, but the choice is not crucial for this discussion.

Having summarized my approach to PPs, I return now to the question of whether (133a) and (58) are compatible. If, as I assume, the NP subject of the purpose clause in (133a) is related to the preposition via some form of θ-role assignment as well as being related to the null operator in the SPEC of

PP, (58) will be violated. Therefore, I reject (133a) as a possible structure for purpose clauses.

Turning now to (133b), if this structure is adopted clearly one of the fors must go. If it is the complementizer which deletes, or fails to be generated as a lexical item, then the subject position of IP will not be case-marked. An alternative would be to allow the preposition for to case-mark the subject of IP in the absence of the complementizer. However, if case-marking across both CP and IP is allowed in this instance, it would be very difficult to explain the ungrammaticality of sentences such as those in (140).

140) a. * I assure you John to be intelligent.
b. * Je crois Jean être intelligent.

Another possibility would be to base-generate a null preposition with the case-marking properties of for as the head of CP in this construction. However, the ungrammaticality of (141)

141) * I was hoping John to win

becomes inexplicable if null infinitival complementizers possess the case-marking abilities of overt infinitival complementizers.

There is evidence which suggests that these problematic proposals should be rejected in favor of the generally accepted view that PCs are bare CPs. Adriana Bellettti has pointed

out that extraction of PPs from adjunct PPs is much worse than extraction of NPs from adjunct PPs.

142) a. * the man to whom you left London without speaking
b. ? the man who you left London without speaking to

Extraction of PPs from within SPCs does not appear to be any more ungrammatical than the extraction of NPs.

143) a. the children to whom you hired him to give French lessons
b. the children who you hired him to give French lessons to

144) a. the children to whom you persuaded him to give French lessons
b. the children who you persuaded him to give French lessons

I believe that (143a) is slightly marginal in comparison with (144a), but that the same degree of marginality distinguishes (143b) from (144b). This marginality is predicted given the status of the purpose clause as an adjunct. Interestingly, extraction of PPs from RatCs, with or without <u>in order</u>, is more deviant than (143a), although slightly less so than (142a).

145) a. ?? the friend for whom you fired Bill (in order) to make room
b. ? the friend who you fired Bill (in order) to make room for[39]

This suggests that PCs are bare CPs and RatCs are PPs.

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39. I find (145b) improves noticeably without the relative pronoun. I have no explanation for this.

Some additional evidence that PCs in English are bare CPs comes from the distribution of gaps and resumptive pronouns in certain OWM constructions in Italian. In Italian degree word clauses (146a,b) and purpose clauses (146c) are ungrammatical with object gaps, but fully grammatical with resumptive pronouns in place of the gaps. The following data is from Cinque (1986)).

146) a. Questo libro è troppo di parte per addoter *(lo) noi
'this book is too biased for us to adopt (it)'
b. Questo lavoro non è abbastanza remunerativo per accettar *(lo) subito
'this job isn't remunerative enough to accept (it) straightaway'
c. Me lo hanno comprato per indossar *(lo) stasera alla festa
'they brought it for me to wear (it) tonight at the party'

Notice that in all three constructions in (146) the preposition per introduces the infinitival clause. There is another kind of purpose clause in Italian which supports null objects as well as resumptive pronouns; it appears with the complementizer da instead of per.

147) Me lo hanno dato da recensir(lo) per domani
'they gave it to me to review (it) by tomorrow'

These facts are easily accounted for if we assume that per is a true preposition, i.e. one which heads a PP and which retains its θ-related properties, while da is, in constructions such as (147), a complementizer on a par with the English for complementizer.

An additional comment, and a bit of speculation, on the correspondence between PCs and purposive PPs: given that complementizer for is historically derived from prepositional for I see no reason that the complementizer might not optionally retain some of the interpretational attributes of its historical antecedent. Assume for the moment that we can, with impunity, characterize the θ-relation which holds between a preposition and its external argument as θ-role assignment. (As mentioned above, Rothstein differentiates between this relation and "real" external θ-role assignment such as that accomplished by a verb.) If (58) is correct, the ability of for to appear as a complementizer in CPs which are predicates by virtue of an operator in their SPEC suggests that the preposition does not assign an external θ-role when it is a complementizer. The transformation from preposition to complementizer may then be characterized as precisely this loss of θ-role assigning capability.

The distributional, interpretational and control properties of the four types of purposive clauses and their PP counterparts derive, in part, from the nature of the subjects they take. RatCs/PPs are event predicates ascribing a particular purpose to an event. OPCs and SPC_Ts take THEME NPs as subjects and SPC_As take agentive NPs as subjects. The difference between being predicated of an event (RatCs) and predicated of an agentive NP (SPC_As) can be difficult to distinguish when the agentive NP is in subject position. However, it is

just this difference which I believe accounts for the two interpretations of (148).

148) I went to Boston to amuse myself.

The two interpretations associated with this sentence[40] differ in what the source of amusement is taken to be. While the sentences in (149) are not "interpretations" of (148), they bring out the relevant difference in interpretation which I am referring to.

149) a. I went to Boston because the trip itself is so amusing.
b. I went to Boston because there are so many amusing things to do there.

A similar contrast, and one which offers easier insight into the problem at hand, is found between the sentences in (150).

150) a. I sent my son to Boston to amuse him.
b. I sent my son to Boston to amuse himself.

(150a) corresponds to (149a)[41] and (150b) corresponds to (149b). Moreover, the reading similar to (149b) is unavailable with a pronominal object of amuse (as opposed to the reflexive object) and the reading similar to (149a) is impossible with a reflexive object. This suggests that control of the embedded

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40. This sentence is given a different analysis than the one I shall propose in Barss (1984); Faraci also noticed and discussed this phenomenon.

41. There is a slight difference interpretation which will be discussed below.

subject is fixed: the matrix subject controls PRO in (150a) and the matrix object controls it in (150b).

As should be obvious from the preceding discussion of purposive clauses, the adjunct clause in (150a) is a RatC and that in (150b) is an SPC_A. This can be tested by inserting <u>in order</u>, which is compatible only with RatCs.

151) a. I sent my son to Boston in order to amuse him.
b. ?? I sent my son to Boston in order to amuse himself.

The ability to be stranded in pseudoclefts also distinguishes RatCs from other purposive clauses and, as expected, only the PC in (150a) may appear in that context.

152) What I did to amuse him/*himself was send my son to Boston.

The purposive in (148) behaves as expected with respect to the pseudoclefting test as well: (153) has only the interpretation corresponding to (149a).[42]

153) What I did to amuse myself was go to Boston.

To reiterate, the correlation is as follows: the "trip = amusing" reading, (149a) and (150a), arises when a purposive is predicated of the event; the "activities in Boston = amusing" reading, (149b) and (150b), arises when a purposive

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42. The <u>in order</u> test does not distinguish so clearly between the two readings when the SPC_A is predicated of the subject.

i) I went to Boston in order to amuse myself.

I have no explanation for this.

is predicated of an agentive NP, subject or non-subject. The former purposive we have identified as a RatC and the latter as an SPC_A.

Faraci discusses another similar sort of phenomenon concerning the following sentences (from Faraci, ch.2, exx. 15-17). (I have altered (154b) slightly from Faraci's original to make the exposition below a little more plausible.)

154) a. The usher is there to receive the tickets.
b. The police are here to screen out undesirables.
c. The accountant is here to look over the books.

He distinguishes two readings for each of these: one which he calls the "function" reading and another which he calls the "intention" reading. With respect to (154b), the intention reading entails that the police are aware of their purpose in being here and intend to engage in it actively. The function reading, on the other hand, could be true if the police think that they are here to guard the ticket money but it is their visible presence which we are counting on to screen out undesirables. Faraci attributes this ambiguity to the status of the subjects in (154) as both THEME and AGENT. The function reading is somehow more closely linked to the THEME role of the subject, while the intention reading is linked to the AGENT role. Within the typology I have proposed, the clause which results in the function reading should be an SPC_T. It is not clear whether the intention reading should correspond to a RatC or SPC_A. In fact, given the discussion above about (148), the clause should be ambiguous between the two and there

should be two distinct readings in addition to the function reading. Moreover, only one of these two readings should be available when in order is inserted.

155) a. The usher is there in order to receive the tickets.
b. The police are here in order to screen out undesirables.
c. The accountant is here in order to look over the books.

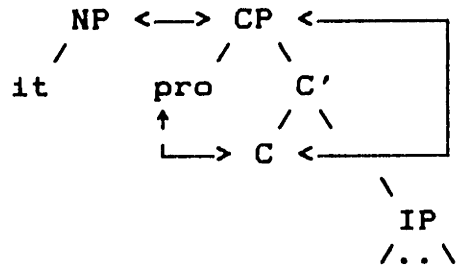
My intuition, though not a strong one, is that what surfaces with the addition of in order is the function reading. There is an aspect of these sentences which may be responsible for this unexpected result (if, in fact, it is a result): the examples in (154) all involve be. Consider the three possible interpretations which my analysis predicts should be available for (154a) given the existence of RatCs, SPC_As and SPC_Ts. (1) RatC: the clause denotes the purpose of the event "the usher is there"; (2) SPC_A: the clause denotes the intent of the usher in being there; (3) SPC_T: the clauses denotes the purpose of the usher in being there. It may be that with the verb be it is difficult to distinguish interpretation (1) from interpretation (3), which would lead to exactly the problematic situation described: insertion of in order seems to force a reading more like the function reading and less like the intention reading.

2.3.6 Predication and Null Operators

In §2.2 I proposed that the subject-predicate relation may be licensed either by θ-role assignment or by means of an agreement chain between the subject and a predicate variable contained in the predicate; I also offered evidence that these two means of licensing the subject-predicate relation are mutually exclusive. In the preceding subsections of §2.3 I further demonstrated that many of the control and distributional properties of PCs are not related to the null operator. In this subsection I will argue that null operators are null pronominals, that is, a null operator is base-generated as pro in an A-position at DS and moved to SPEC of CP in the mapping from DS to SS. I assume that pro in an A′-position, like pro in the subject position of tensed sentences, must be identified by agreement. Movement of pro to SPEC of CP brings it into a position where this requirement may be satisfied by means of the agreement chain discussed in §2.2. (157) indicates the agreement relations related to the OPC which hold in the sentence in (156); agreement relations are indicated with arrows.

156) I bought it [PRO to read e]

157)



The phi-features of pro are licensed by means of this "chain" of agreement and pro is thereby licensed to head a chain, an A′-chain in this case.

Given a typology of empty categories such as that proposed in CC, there are essentially two options for null operators: PRO and pro. Most discussions of null operator constructions since (and including) OB have chosen PRO as the category-type of null operators. There are two problems with this. First, null operators may coexist with lexical complementizers, as is demonstrated in many examples throughout this dissertation. If null operators are PRO, then we must assume that government is directional, i.e. that a head governs only its complements and not its SPEC. This position is probably untenable for Case reasons; see, in particular, the discussion of the Uniformity Condition in KoL. It is also inconsistent with the approach to ruling out clauses such as that in (158) which takes tensed INFL as a governor of the subject position of IP.

158) ... PRO wrote a bestseller.

Secondly, as pointed out in chapter one (§1.4) null operators share almost none of the "referential" properties of subject PRO. While these differences might be accounted for on the basis of the A/A′ distinction between null operators and subject PRO, such an analysis would require a major revision in control theory. If, on the other hand, we take null operators

to be the null pronominal, pro, no complication of the identification mechanism for that empty category is required. The extension of the agreement relation proposed in §2.2, by means of which operator pro is identified, is independently motivated by the analysis of syntactic predication offered in that section.

The analysis of null operators just proposed has been formulated on the basis of the typology of empty categories found in Chomsky (1982), a typology based on the features [±pronominal, ±anaphor], which I will refer to as "binding features" following Barss (1986). It should be obvious that this analysis is compatible with any typology of empty categories which includes an element with the following properties (all of which are properties of pro): it may be governed, must be an argument, may head an A′-chain, and must be identified via agreement. There is nothing in the analysis which requires the null operator to be a pronominal; the binding features are relevant only to the extent that they differentiate between ungoverned PRO and governed pro. Brody (1985) and Barss (1986) have proposed that the distribution and behavior of empty categories may be accounted for without assigning them binding features. Barss, in particular, points out several problems for the analysis of certain OWM constructions and parasitic gap constructions which a binding feature-based typology of empty categories does not seem to be able to handle. A detailed reformulation of the theory of empty categories is

beyond the scope of this dissertation, but some further discussion of these issues appears in §3.4

Finally, Rizzi (1986) proposes a very interesting account of generic null objects in Italian which takes these elements to be pro. Although an in-depth examination of the data and proposals contained in that article are beyond the scope of this work, I would like to suggest that the phenomena Rizzi analyzes might be equally well accounted for if we assume that Italian has non-overt object agreement and that object pro, like subject and operator pro, is identified via agreement. Such an approach would link Italian with languages such as Hindi which have overt object agreement capable of licensing null objects; see Cole (1985).

2.4 Relative Clauses and Others

2.4.1 The Structure of Relative Clauses

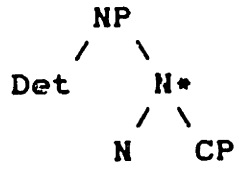
The structure of simple relative clauses such as those in (159) has been, and continues to be, the topic of much debate.

159) a. the man$_i$ that I met e$_i$
b. the man$_i$ who$_i$ I met e$_i$

Without going into detail, this section will present some of the proposals which have been made regarding relative clause structure and offer some evidence in favor of the structure I wish to assume. Stockwell, Schachter & Partee (1973) and Partee (1975) argue for an analysis of relative clauses which

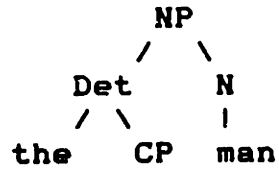
gave the determiner scope over both the head noun and the clause, a structure analogous to that in (160), with N* = N′ or Nom.

160)



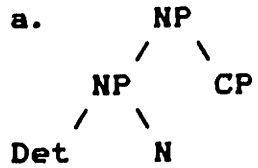
A similar structure is adopted by Vergnaud (1974), where it is argued that the head noun is base-generated within CP and raised into it SS position. Yet another approach is found in Chomsky (1965) where the base-generated structure of a relative clause is as in (161).

161)



The clause in (161) reaches its SS position by a movement transformation akin to other instances of sentential extraposition. (See also Lees (1961) and Bowers (1970).) The discussion of (161) in Chomsky (1965) is not explicit as to the location of CP after the application of the extraposition transformation; two options available within that framework are shown in (162).

162) a.

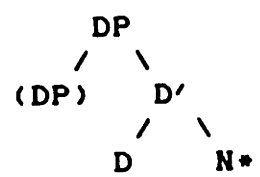


b.

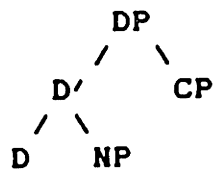


Chomsky (1973) adopts the structure in (162a) without reference to its derivational history; this structure appears widely in much later work as well. More recently, Speas (1986), Speas & Fukui (1986) and Abney (1987) propose variants of an analysis of NPs which regards the determiner as the head of a category DP, as illustrated in (163a) where N* = N′ (for Speas & Fukui) or NP (for Abney).

163) a.



b.



Abney then argues that the structure shown in (163b) is the correct structure for relative clauses. Within the DP framework, the determiner selects NP as a complement, although the head-complement raltion here does not involve θ-role assignment. According to Higginbotham (1985), the relation between a determiner and noun is one of "θ-binding": the determiner binds, and thus discharges, the θ-role which Higginbotham argues is part of the θ-grid of every noun. Given a structure such as (161) the relation between the clause and the determiner is relatively clear; the determiner selects the clause. The nature of relation between them in (163b) is less obvious; Abney suggests that the clause selects the determiner. This seems rather odd since surely the clause is modifying what is traditionally called the NP head of the relative rather than the determiner. (To avoid confusion I will refer to this nominal element as the "relative NP".) I will present only one

argument for the structure in (163b) and refer the reader to the references cited for further discussion of the DP analysis in general as well as for additional arguments in support of the structure in (163b).

There is an interesting contrast between relative clauses and clefts which, I believe, offers evidence in favor of the structure in (163b). Gaps in relative clauses appear to be indefinite even when the relative heads are definite. (164) gives three contexts from which a definite NP is excluded. The grammaticality of the relative clauses in (165) indicates that the gap is treated as an indefinite. (The (c) examples were discussed in Schachter (1973); The (b) examples were pointed out to me by N. Chomsky.)

164) a. * There were the men in the garden.
b. * John had the question for the teacher.
c. * We made the headway on that problem.

165) a. The men that there were in the garden were all diplomats.
b. The question that John had for the teacher was a difficult one.
c. The headway that we made on that problem was not sufficient.

In contrast, the gap in a cleft is not treated as an indefinite when the antecedent is definite.

166) a. * It was the men that there were in the garden.
b. * It was the question that John had for the teacher.
c. * It was the headway that we made on that problem.

The contrast between (165) and (166) might be explained by arguing that traces of relative clause operator movement are

inherently indefinite, but this could not be generalized to all traces of A'-movement, as shown by the ungrammaticality of (166) and (167).

167) There are t in the garden, *the people who want to see you.

Alternatively, if we adopt the structure for relative clauses in (163b) the antecedent of the relative operator could be NP (in fact, no other option exists within the DP analysis), a category which is unspecified for definiteness.[43] In the case of (166a), with the structure in (168),

168) It was $[_{CP}$ $[_{DP}$ the men]$_i$ $[_{CP}$ Op$_i$ that [there were t$_i$ in the garden]]]

the only possible antecedent for the operator is DP, a category fully specified as definite. In the next section I will assume that the structure of relative clauses is as in (163b), although the proposals to be made are compatible with other structures as well; for further discussion of issues related to relative clause structure, see Saddy (in progress) and the references contained therein.

2.4.2 R-Binding vs. Predication

An interesting question concerning the proper analysis of relative clauses is whether the relative NP (if it is a

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43. In principle, this is also possible if we adopt the NP-analysis, the drawback being that there is no maximal projection to serve as the antecedent of the null operator chain.

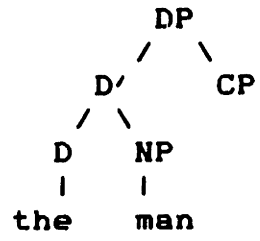
constituent) is in an A-position or an A′-position.[44] Safir (1986) offers convincing evidence that binding by a relative NP, which he refers to as "R-binding", is not A′-binding, i.e. that the relative NP is not in an A′-position. (Safir assumes the relative clause structure in (162a) and, therefore, regards the determiner + noun sequence as a constituent.) The main argument against regarding R-binding as a species of A′-binding comes from the data in (169), which indicate that R-binding does not license parasitic gaps.[45]

169) a. * the report$_i$ [the author of which$_i$], Mary married t$_j$ without filing e$_i$
b. * the report$_i$ [the author of which$_i$], Mary filed t$_i$ without reading e$_i$

(169b) is an example of the well-known constraint against vacuous A′-binding. Safir notes, crediting Woolford (1981)

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44. In the DP structure in (163b) the determiner and noun (NP) for a constituent, but not a maximal projection. Nevertheless, the question of whether the relative NP is in an A-position or an A′-position can still be formulated with respect to the NP alone, i.e. is man in (i) in an A-position or an A′-position?

i)


It is not so clear that the same question could be formulated within the framework of Speas & Fukui (1986) and Speas (1986) since they regard the NP in (i) as an N′, a non-maximal projection. Thus, for man to be a binder of any sort, it would be necessary to include X′ categories in the set of potential binders.

45. The data in (169) - (176) and in fn. 49 are from Safir (1986).

with the observation, that R-binding may be vacuous within IP but not within CP. More specifically, he argues that the relative NP must bind something within Comp (= the SPEC of the relative CP; I will retain Safir's terminology during this summary of his article).

170) John$_i$, [a picture of whom$_i$]$_j$ Mary tore up t$_j$, ...

Safir expresses the obligatoriness of R-binding in his Locality Condition on R-Binding (LCR).

171) If X is locally R-bound, then X is the structurally highest element in Comp.

It follows that R-binding of a gap in a relative will always be mediated by A'-binding.

Relative clauses with heavy pied-piping, such as (172), appear to be counterexamples to the LCR.

172) Those reports, the height of the lettering on which the government prescribes, are tedious.

However, such structures cease to be counterexamples if there is wh-movement within Comp at LF, as Safir argues.

His first argument for this proposal is that there appears to be an overt counterpart to the proposed operation of LF movement within Comp. This counterpart is at work in

deriving sentences such as (173), which are relatively grammatical for some speakers.[46]

173) Those reports, which the height of the lettering on the government prescribes, are tedious.

The inability of the pied-piped NP to license a parasitic gap, as shown in (174),

174) a. * these reports$_i$ [which$_i$ the height of the lettering on e$_i$], John changed e$_j$ without filing e$_i$, ...
b. these reports$_i$ [which$_i$ the height of the lettering on e$_i$], John changed e$_j$ without measuring e$_j$, ...

is taken as evidence that (173) cannot be a topicalization + wh-movement structure.

Additional evidence for the wh-movement-in-Comp hypothesis comes from some facts, noted by Kayne (1983), concerning the distribution of wh-phrases in-situ within pied-piped constituents. Kayne noticed that if one wh-phrase in Comp c-commands another coreferential wh-phrase in Comp, the resulting sentence is ungrammatical.

175) a. * John$_i$, whose$_i$ picture of whom$_i$ Mary liked, is late.
b. John$_i$, whose$_i$ brother's picture of whom$_i$ Mary liked, is late.

As illustrated by (175b), if neither of the two wh-phrases c-commands the other, the sentence is grammatical. Safir links

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46. What Safir actually says about the grammaticality of (173) is that "some speakers do not distinguish its acceptability from that of" (172).

this phenomenon with the ungrammaticality of such sentences as those in (176).[47]

176) a. * Any man$_i$ his$_i$ portrait of whom$_i$ Mary sees, she despises.
b. *? Any man$_i$ his$_i$ brother's portrait of whom$_i$ Mary sees, she despises.

Presumably (176a) would be ruled out for the same reasons as (175a), but the ungrammaticality of (176b) is unexpected, given the grammaticality of (176b). Given Safir's proposals that there is wh-movement in Comp at LF and that the PCOB applies to the output of this operation as well as to more traditional instances of Move wh, the data in (175) and (176) is accounted for as follows: (175a) is, as Kayne argued, ruled out by Binding Condition C, since LF movement of <u>whom$_i$</u> leaves a variable c-commanded by a coindexed NP in an A-position. (175b) is grammatical because <u>whose$_i$</u> fails to c-command the variable left by LF movement of <u>whom$_i$</u>. (176a) is ruled out both by Binding Condition C and by the PCOB; (176b) is ruled

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47. In spite of the awkwardness of heavy pied-piping with restrictive relatives, the phenomenon in question must be tested with structures such as those in (176). As will be discussed in the text immediately below, the ungrammaticality of these relatives results from a weak crossover violation (a PCOB violation in Safir's terms) and weak crossover violations do not arise in nonrestrictive relatives. We therefore expect the nonrestrictive relative in (i) should be as grammatical as (ii), abstracting from marginality induced by complexity.

i) John$_i$, his$_i$ brother's portrait of whom$_i$ Mary liked, moved to Canada.
ii) John, who his mother loves, moved to Canada.

(i) should also be more grammatical than (176b), which seems to be the case.

out only by the PCOB, hence the weaker nature of the violation in (176b).[48] To sum up Safir's proposals, the data above may be accounted for by an analysis incorporating the PCOB and obligatory LF wh-movement in Comp. The latter operation is obligatory because of the requirements of the LCR, a constraint which can only be formulated on the basis of R-binding, the relation holding between the relative NP and a wh-phrase in Comp.[49]

Although Safir suggests that R-binding may play a role in licensing resumptive pronouns in English, the primary motivation for introducing this relation into the grammar is to allow the formulation of the LCR, which in turn forces LF wh-movement in Comp. However, the licensing constraint on the subject-predicate relation proposed in §2.2, (19), independently requires the wh-phrase in a pied-piped constituent to be the "highest element in Comp", in Safir's terms. To see that this is so it is necessary to examine the structure of a

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48. The examples below show that the same effects cannot be captured by a reconstruction analysis of the facts.

i) *? John$_i$, [whose$_i$ sister], her$_j$ child loved, doesn't usually like kids.
ii) John$_i$, [whose$_i$ sister], loved her$_j$ child, doesn't usually like kids.

If <u>whose sister</u> is reconstructed to its DS position and <u>whose</u> is subsequently extracted, no weak crossover effects are expected, since there is no pronoun in the relative clause which is coreferential with <u>whose</u>.

49. Safir (1986) contains some other interesting proposals, which are not relevant for this discussion, relating to the existence of the level LF′ and the appropriate analysis of nonrestrictive relatives.

relative clause with heavy pied-piping, such as that in (172), which is repeated as (177a) with the relevant portions of the relative clause structure given in (177b).

177) a. Those reports, the height of the lettering on which the government prescribes, are tedious.

b. $[_{DP_1}$ $[_{D'}$ those $[_{NP}$ reports$]_i$ $]$ $[_{CP}$ $[_{DP}$ the height of the lettering on which$_i$ $]_j$ IP $]]$

To be licensed in accordance with (19b), an agreement chain must be formed linking the NP reports with which in the relative clause. However, in (177b) the SPEC of CP is the DP the height of the lettering on which, not which. Therefore, no agreement chain may be formed and the structure will be ruled out. If there is LF wh-movement within SPEC of CP then which might be able to reach a position from which it could be regarded as the element in agreement with the head of CP, thereby allowing an agreement chain to form.

Two assumptions are necessary to make this approach work: the first is that SPEC-HEAD agreement in CP need not hold at SS. If, in (177b), DP2 agrees with the head of CP the configuration in (178) will result and predication will not be licensed.

178) $[_{DP_1}$ ... NP_i $[_{CP_j}$ $DP2_j$ $[_{C'}$ C_j IP $]]$ $]$

The second necessary assumption is that (19) must be regarded as a post-SS constraint, since, in the heavy pied-piping cases, the appropriate agreement relations will not hold until LF. In addition, if Safir (1986) is correct in saying that

nonrestrictive relatives are not attached until LF′ then the subject-predicate relation which (19) governs in (172)/(177a) will not even exist until LF′.

While the second assumption is unproblematic, the first raises questions which are not easy to answer. Safir gives as the output of LF wh-movement in SPEC of CP (= Comp) a structure which (given the clausal structure I have adopted) translates into that in (179).[30]

179) ... $[_{CP}$ $[_{XP}$ wh_i $[_{XP}$ ...t_i...]] $[_{C'}$ C IP]] ...

As indicated, wh_i is adjoined to the pied-piped category; see fn. 50. To permit agreement between wh_i and C, the SPEC and head of CP respectively, one of two options must be adopted: (i) the index and features of wh_i may percolate to XP* or (ii) C may agree with an element in its SPEC which it governs. If the i-within-i condition exists, then option (i) would probably be untenable. Notice that whichever option is adopted, SPEC-HEAD agreement must be regarded as the result of an operation, in contrast with structural relations such as "c-

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50. Safir gives only the structures in (i) and (ii), which correspond to ungrammatical relative clauses.

i) s′ comp [whom$_i$ [his$_i$ portrait of e_i]] s[...
ii) s′ comp [whom$_i$ [his$_i$ mother's portrait of e_i]] s[...

These structures are not ruled out because of some problem with the execution of wh-movement in COMP and, therefore, I assume that the structure given is that which would arise in a grammatical relative clause as well. Although the brackets I have given in bold are not labelled, I assume that (i) and (ii) represent adjunction structures, i.e. that the wh-phrase adjoins to the COMP which contains it.

commands" or "governs". Resolving these technical issues also requires a more precise understanding of specifiers and the nature of the relation which holds between specifiers and heads in general and between C and the SPEC of C, in particular. I take up the problem of SPEC-HEAD agreement in CP in more detail in work in progress.

As a final note, although the data in this section indicate that (19) needs to be satisfied at a post-SS level, it is necessary that the agreement chain form at SS when operator pro is involved, since pro must (like all other empty categories) be identified at SS if it is present at SS. This correctly predicts that pied-piping will be impossible with null operators.

180) a. * Those reports, the height of the lettering on pro the government prescribes, are tedious.

b. $[_{DP_1}$ $[_{D'}$ those $[_{NP}$ reports$]_i$ $]$ $[_{CP}$ $[_{DP}$ the height of the lettering on pro$_i$ $]_j$ IP $]]$

At SS pro remains in an A-position where it cannot form an agreement chain with an NP capable of identifying it. Although (180a) does not violate (19b), under the assumption that pro could adjoin to DP2 at LF giving a structure comparable to that in (179), the sentence is ruled out because pro fails to be identified. This approach also predicts that, if Safir's analysis of nonrestrictive relatives is correct, null operators will not be able to appear in nonrestrictives. At SS (and LF) the relative clause is not attached to the structure containing the NP which it will eventually be predicated of at

LF′. At SS there is no NP which operator pro in the SPEC of the relative clause agrees with; therefore, sentences such as (181) will be ruled out.

181) * John, Mary likes e_i, lives in Maine.

While this prediction is fine for English, it is problematic for languages such as Italian and French which allow nonrestrictive relatives to appear without overt wh-phrases. (Examples from Cinque (1982).)

182) a. Elaine, che abbiamo visto proprio ieri, ...
b. Elaine, que nous avons vu justement hier, ...
'Elaine, that we saw just yesterday,...'

I have no account of these cross-linguistic differences at the moment.

2.4.3 Notes on Some Other OWM Constructions

The analysis of null operators in purpose clauses given in the preceding sections extends naturally to other OWM constructions, although, of course, each construction has its own idiosyncrasies which interact with various aspects of the principles governing null operator distribution to produce different behaviors. Time constraints prevent the kind of in-depth analysis of each of these constructions which I hope to develop in future work. In this section I will sketch some ideas for dealing with degree clauses which also indicate possible directions to take in accounting for adjectival complement constructions.

A serious analysis of degree clauses is contingent on thorough analyses of NP/DP-internal structure, AP-internal structure and determiners of all sorts. In the absence of these, it is still possible to get an idea of what a reasonable analysis of degree clauses might look like, or, at least, what such an analysis would have to account for. First of all, the degree specifier <u>too</u> can appear with both adjectives and certain quantifiers.

183) a. John is too angry to talk to.
b. John likes eating too much to diet.

<u>Too</u> can appear prenominally, but only when it modifies a quantifier.

184) a. * John is a too angry man to talk to
b. * John is a too angry man to try to reason with him.
c. * John is a too angry to talk to man.
d. * John is a too angry try to reason with him man.

185) a. Too many people to dance with them all came to the party.
b. ?? Too many people to dance with came to the party.
c. I brought home too many books to read them all in one night.
d. ?? I brought home too many books to read in one night.

As shown by (185b,d), even when <u>too</u> appears with a quantifier prenominally, the presence of an object gap, i.e. a null operator, decreases the grammaticality of the structure. Sometimes sentences such as (185b,d) sound rather acceptable, but this may be because the clauses are being interpreted as infinitival relatives rather than as degree clauses. A way to factor out the infinitival relative clause reading is to add a

real relative clause to the NPs in (185). Since infinitival relatives don't stack, the second clause in a structure like (186) must be a degree clause.

186) a. * [Too many [people to interview] [to talk to before noon]] arrived at nine.
b. * I brought home [too many papers [to grade] [to write comments on]]

The ungrammaticality of (186) shows that, indeed, degree clauses associated with prenominal <u>too</u>s are ungrammatical.

A related phenomenon is the inability of a null operator to appear in a degree clause when <u>too</u> modifies an adverb or a quantifier used adverbially. (Keep in mind that pro_i is the null operator.)[51]

187) a. ?? John likes $Bill_i$ [too much [pro_i to fire e_i]
b. ?? $John_i$ works [too little [pro_i to promote e_i]
c. ?? $Mary_i$ intimidates John [too much [pro_i for him to hire e_i]

188) a. ?? $John_i$ arrived [too recently [pro_i for me to have met e_i]
b. ?? Mary sees $John_i$ [too infrequently [pro_i to recognize e_i]

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51. For reasons which I do not understand, some speakers find the in (187) and (188) acceptable. Even speakers like myself, who find (187) and (188) very bad, accept some of the sentences below.

i) John ran too quickly for us to catch e
ii) John spoke too softly to hear e
iii) ? John spoke too softly to listen to e
iv) John threw the ball to far to catch e
v) ? John threw the ball too far to retrieve e
vi) ?? The vase fell off the table too quickly for me to catch e
vii) ?? John fell down the stairs too quickly for me to save e

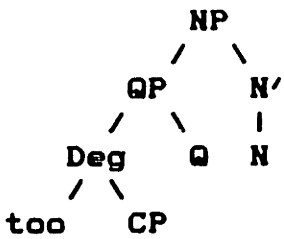
I have no explanation for this behavior.

c. ?? John types [too poorly [pro$_i$ to hire e$_i$]
d. ?? Mary left the party [too early [pro$_i$ for me to talk to e$_i$]

The data in (185) - (188) support the hypothesis that null operators can be coreferential only with the subject of the predicate containing the operator. In (187) and (188) the adverbs containing the null operator clause are not predicated of the NPs with which the null operator is coindexed. By the analysis in the preceding sections, the pro$_i$ cannot receive phi-features and cannot in turn identify the variable.

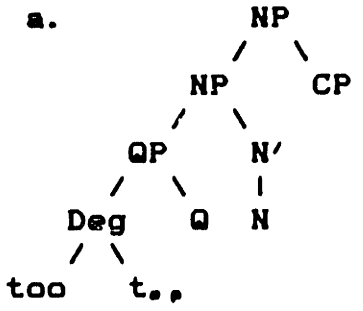
Accounting for the ungrammaticality of (185b,d) and (186) is trickier. Assume for the moment that the structure of the NPs in these examples is something like that in (189), which follows Bresnan (1973).

189)

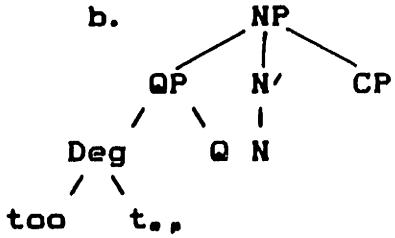


SS word order is achieved by extraposing the degree clause to the right of N, either "Chomsky-adjoining" or "daughter-adjoining" it to NP, as shown in (190a,b).

190) a.



b.



If the degree clause itself is a predicate, then in both (190a) and (190b) it could agree with N and A'-pro could be licensed. Two ways of ruling this out come to mind: first, only XPs are generally regarded as potential subjects of predicates and there is no XP in (190b) which could fulfill that function. However, if an adjunction structure like that in (190a) is assumed to be the proper analysis of relative clauses, then the adjoined-to NP is a potential subject and (190a) should be fine. An alternative is that the clause which appears with degree specifiers isn't an independent predicate but, when it hosts a null operator, must combine with an independent predicate for the purpose of licensing the null operator. In fact, the clauses which appear with degree specifiers are generally referred to as "result clauses", although a more appropriate term in the case of <u>too</u> clauses would be "negative result clauses." Consider the two sentences in (191).

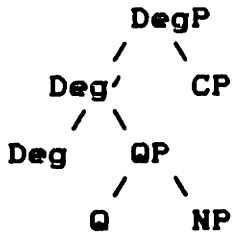
191) a. John is too angry for us to borrow the car now.
b. John is too angry to talk to.

(191a,b) differ in interpretation with respect to whether the result clause is part of the property being predicated of <u>John</u> or not. In (191a) John has the property [is angry] to such a degree that we cannot borrow the car (presumably, from him). In (191b) John has the property [is angry to such a degree that one cannot talk to him]. It seems correct to say that the clauses which appear with <u>too</u> are not independent predicates;

given the constraints on licensing A′-pro, this would mean that (190a,b) are not possible structures and (187) - (188) are ruled out.

Abney (1987) assigns a structure like that in (192) to the NPs in (187) - (188).

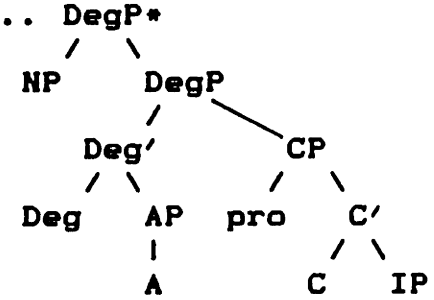
192)



While CP might be taken as a predicate of QP, QP does not agree with NP and no licit agreement chain exists to license the A′-pro in the SPEC of CP. This structure is compatible with the position that degree clauses are not independent predicates as well.

It remains to show how the grammatical instances of degree clauses are licensed, for example, (191b). Taking the DegP analysis as a starting point, along with the Stowell/Couquaux analysis of copular sentences, the DS representation of (191b) is (partially) as in (193).

193)



Abney assumes that phi-features reside in the determiner of NPs; the analog for APs is that phi-features (i.e. agreement features) reside in Deg, when it appears. This seems a bit counter-intuitive, but suppose for the moment that it is correct. Then NP and DegP agree and Deg agrees with DegP, by convention. The clause is in the SPEC position of Deg; therefore, if SPECs and HEADs agree in this case as well as in the other cases I have assumed (CP and IP), then CP agrees with Deg. CP agrees with its head C, which agrees in turn with pro in the SPEC of CP. An agreement chain exists between the subject NP and the A′-pro.

Although the analysis just sketched does not really capture the "non-independent predicate" status of the clause (there is no link at all between the clause and the AP) it is both plausible and empirically adequate over the initial range of data examined. It is also easy to see how this approach could be extended to adjectival complement constructions such as those in (194).

194) a. John is easy to please.
b. This view is pretty to look at.

Further development of the analysis sketched in this section will be undertaken in work in progress.

CHAPTER THREE

PARASITIC GAP CONSTRUCTIONS

3.1 Null Operators and Parasitic Gaps

In chapter one parasitic gap constructions were shown to have several properties in common with OWM null operator constructions. In this first section I will review these properties in greater detail, arguing that the null operator hypothesis offers the most parsimonious account of parasitic gap constructions. In §1.3.2 I introduced three differences between parasitic gap constructions and OWM constructions which were phrased in the form of three questions which any null operator-based analysis of parasitic gaps must answer. These questions are repeated in (1).

1) a. What is the anti-c-command constraint and why does it affect only parasitic gap constructions?
   b. Why do parasitic gaps require an SS A′-antecedent while the gaps in OWM constructions do not?
   c. Why are canonical parasitic gap constructions marginal while canonical OWM constructions are not?

Questions (1b) and (1c) will be dealt with in §3.2, while §3.3 will focus on the anti-c-command effect and effects of moving the category containing the parasitic gap. In the remainder of this section I will lay out the basic elements of my analysis of parasitic gap constructions and demonstrate its compatibi-

lity with the analysis of null operators given in the preceding chapter.

3.1.1 The Null Operator Hypothesis

Early analyses of parasitic gap constructions carried out within a GB framework, e.g. Taraldsen (1981), Huang (1982) and CC, argued that parasitic gaps were base-generated empty categories, not empty categories derived by movement. Part of the motivation for this position came from their apparent immunity to the Subjacency Condition (or the Condition on Extraction Domain[1] (CED) of Huang (1982)). For example, Huang offers the following pair of sentences with judgements as indicated.

2) a. * Which book$_i$ did you go to college without reading t$_i$
   b. Which book$_i$ did you buy t$_i$ without reading e$_i$

If parasitic gaps were movement derived, so the argument goes, they should exhibit a degree of ungrammaticality as strong as that assigned to the single gap construction, e.g. (2a). They do not; therefore, parasitic gaps are not derived by movement. Both Chomsky (1982; CC) and Huang take the contrast in (2) as evidence that the relevant bounding constraint (Subjacency or

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1. Huang defines the CED as in (i) and cites similar ideas in Belletti & Rizzi (1981), Marantz (1979), Cattell (1976).

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

the CED) is a condition on movement rather than on representation.[2]

Kayne (1983) pointed out that the parasitic gap is not completely immune to island constraints, as illustrated by the contrast in grammaticality between the prime and non-prime sentences of (3) - (5).

3) (Where α = NP or CP)

a. ? wh- ... t [$_{PP}$ P [NP V [$_{\alpha}$ ... e] ...

a′. * wh- ... t [$_{PP}$ P [[$_{\alpha}$ ... e] V ...] ...

b. ? the person that J described t without examining any pictures of e

b′. * the person that J described t without any pictures of e being on file

c. ? The books you should read t before it becomes difficult to talk about e

c′. * The books you should read t before talking about e becomes difficult

4) (Where α = IP or a small clause)

a. ? wh- ... t [$_{PP}$ P ... V [$_{NP}$ N P e]]

a′. * wh- ... t [$_{PP}$ P ... V [$_{\alpha}$ [$_{NP}$ N P e] ...]

b. ? a book that he reviewed t without believing the first chapter of e

b′. * a book that he reviewed t without believing the first chapter of e to be full of lies

c. ? a man that he recognized t after seeing a picture of e

c′. * a book that he threw t away after finding a chapter of e missing

5) a. ? wh- [$_{IP}$ [$_{NP}$ ... N P e] V t]

a′. * wh- [$_{IP}$ NP V t [$_{PP}$ P [$_{CP}$ [$_{IP}$ [$_{NP}$ N P e] VP]]...

b. ? a person who close friends of e admire e

b′. * a person who you admire e because close friends of e become famous

---

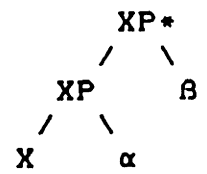
2. See Saito (1984) for additional arguments that the CED is a condition on rule application.

There are two major paths which have been pursued in resolving the contradiction represented by (2) and (3) - (5).[3] One is that taken by Kayne (1983) (adopted and developed by Longobardi (1984), Cinque (1986a, 1986b) and Pesetsky (1982), among others), who argues that the parasitic gap phenomenon indicates that (some) island constraints apply both to movement-derived and non-movement derived structures and, therefore, must be formulated as conditions on representation. The alternative position, put forth by Chomsky (1986), Stowell (1985) and others, claims that the phenomenon indicates that para-

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3. Huang's solution was to argue that the CED was both a condition on representations and a condition on movement. The contradiction was resolved by adopting different definitions of government for the two CEDs. Given a structure such as that in (i),

i)

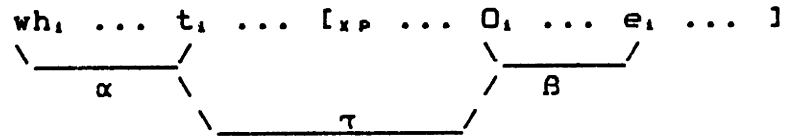


the Aoun-Sportiche (1981) definition of government allows X to govern both α and ß. A stricter definition of government would allow X to govern only α. Huang proposes that, when the CED is a condition on movement, the stricter definition of government is relevant. This would allow extraction only from within complements, as desired. When the CED is a condition on representations, the Aoun-Sportiche (AS) definition is relevant; that is, a verb AS-governs a PP adjunct in the position of ß. This approach correctly rules out (2a) and the ungrammatical sentences of (3) - (5) and rules in (2b). However, this incorrectly predicts that (ii) will be grammatical.

ii) * Which book$_i$ did you read t$_i$ [$_{PP}$ without consulting Mary [$_{PP}$ before buying e$_i$]]

Since both adjunct PPs are AS-governed by their respective verbs, no CED effect is expected. See §3.2 for further discussion of sentences such as (ii).

sitic gaps are, after all, movement-derived.[4] The contrast between (2a) and (2b) is explained since, in these and all variants of the hypothesis that I am aware of, it is assumed that the null operator does not move to the position of the licensing operator at SS, but only to an A′-position within the adjunct. Therefore, in a parasitic gap construction with the structure shown schematically in (6), where XP is an adjunct,

6) 

XP will not induce an adjunct condition violation since there is no instance of movement which crosses that boundary. All island effects will be expected to hold within α and ß. The conditions responsible for island effects remain conditions on movement. There are constraints which govern τ, the portion of the structure in (6) between t$_i$ and O$_i$, however. Consider the sentence in (7a), discussed briefly in fn. 3, and the structure in (7b) which might be assigned to it.

7) a. * Which book$_i$ did you read t$_i$ without consulting Mary before buying e$_i$

b. [$_{CP3}$ wh$_i$ [... t$_i$ ... [$_{PP2}$ without [$_{CP2}$ ... [$_{PP1}$ before [$_{CP1}$ O$_i$ ... e$_i$ ...]]]]]]

---

4. Contreras (1986) Aoun & Clark (1984), working within versions of the Generalized Binding framework of Aoun (1981, 1985, 1986), also adopt a null operator analysis of parasitic gaps. Generalized Binding subsumes some of the the island effects being discussed in the text under an extension of the LGB binding theory. I will postpone discussion of their proposals until §3.2.5.

The sentence is ungrammatical, yet no there are no Subjacency Condition violations within the portions of the structure corresponding to α and ß. As long as there is nothing in the analysis to force movement of the null operator to the SPEC of CP2 the Subjacency Condition or the CED as conditions on movement will be incapable of ruling out (7a). Various means of expressing the locality condition governing the relation between the α and ß portions of (6) have been proposed and there are important differences in the proposals regarding which element(s) in (6) the locality constraint should apply to. Aoun & Clark (1984) and Contreras (1986) propose that the Generalized Binding Theory of Aoun (1981, 1985) governs the relation between the null operator and the licensing operator; Chomsky (1986a) proposes that O-Subjacency is required between t_i and O_i in order for chain composition, the means of licensing parasitic gap constructions, to apply to the two chains.

Before looking more closely at the bounding properties of and locality constraints governing parasitic gap constructions, I will discuss the manner in which the null operator of these constructions differs from that in OWM constructions. In particular, §3.1.2 will address question (1b): Why do parasitic gaps require an SS A′-antecedent while the gaps in OWM constructions do not?

3.1.2 Licensing pro in Parasitic Gap Constructions

In chapter two I argued that null operators in OWM constructions are pro, base-generated in argument position and moved in the mapping from DS to SS to the SPEC of CP. In §2.2.3 two means of constraining the distribution of null operators were suggested: condition (46), repeated as (8) below, and condition (58), given as (9a) ((9b) is (19) of §2.2.1).

8) An empty category is an operator only if it is in the SPEC of CP.

9) a. A subject-predicate relation may not simultaneously satisfy both clauses of (9b).

b. A subject-predicate relation is licensed if
(i) the subject discharges the external argument of the predicate or
(ii) the subject agrees with a chain contained in the predicate.

Operator pro is identified by an "agreement chain" which links it to the subject of the predicate; see §2.3.6 for discussion. The possible antecedent of the operator is, therefore, limited to the subject of the predicate which contains it.

Consider now the sentences in (10), which I regard as canonical examples of the parasitic gap phenomenon.

10) a. ? Which article$_i$ did you review t$_i$ without reading e$_i$
b. ? an artist$_i$ who$_i$/that close friends of e$_i$ admire t$_i$

Assuming for the moment that the structure of the adjunct PP in (10a) is as in (11)

11) ...[$_{PP}$ α' [$_{P'}$ without [$_{CP}$ α [$_{IP}$ ... e$_i$ ...]]]]

a null operator might conceivably come to rest at SS in either the SPEC of CP (α) or the SPEC of PP (α'). Because the clausal object of a preposition is not a predicate, no agreement chain exists which could identify pro in the position of α. PP, as I have argued in chapter two, is a predicate; a pro in the position of α' would be in position to agree with an antecedent. However, the PP in (10) and, in fact, most PPs which host parasitic gaps, are predicated of the sentential E(vent)-position, not an NP.[5] Since operator pro in the SPEC of a predicate may only be identified by the subject of the predicate within which it resides, the E-position is the only candidate antecedent for pro in (10a). I have already shown in chapter two that the E-position cannot identify pro, as we would naturally expect.

Turning to (10b), a pro in the SPEC of NP might be in position to participate in an agreement chain, depending on

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5. This is not true of the PP hosting a parasitic gap in (i). (Actually, it's not at all obvious which is the "real" gap and which is the parasitic gap in these sentences, but for the sake of discussion, I will assume that the PP-internal gap is parasitic.)

i) who did you give pictures of t_i to e_i

A pro in the SPEC of the PP above would be in position to agree with an NP antecedent, but this potential antecedent is the NP containing the "real" gap, i.e. "picture of t", not the "real" gap itself. This would create a situation at SS where the immediate A'-binder of the parasitic gap is in agreement with an NP bearing a different index from the parasitic gap. Sentences such as (i) are noticeably worse than canonical parasitic gap constructions; a phenomenon which is not explained by anyone's analysis, as far as I know.

the structure of NP. Assume for the moment that something like (12) is a possible structure for the relevant portion of (10b).

12) ... $[_{IP}$ $[_{NP}$ pro_i ...N_j... $]_j$ AGR_j ...] ...

The j indices indicate the standard agreement relations: the subject of IP agrees with AGR and the head N agrees with its maximal projection. The NP containing pro in (10b)/(12) is not a predicate but no stipulation has been made to the effect that pro may be identified by an agreement chain only when it resides in the SPEC of a predicate. If i = j then pro would participate in an agreement chain and might be considered to be licensed. However, notice that this configuration (with i = j) will not yield an appropriate interpretation for (10b) since the null operator (and the variable it binds) will be coreferential with the subject NP close friends of e rather than with the head of the relative an artist. The configuration which results in (12) if i = j is a classic i-within-i violation and will be ruled out accordingly.

For both cases in (10), the proposals governing null operator licensing proposed in chapter two fail to assign A'-pro in parasitic gap constructions the phi-features needed to be a licensed head of a chain.

The analysis I will propose for parasitic gap constructions is in the spirit of Chomsky (1982) in that it seeks to account for their existence and properties without the addition of any construction-specific process or constraint. The

central proposal of this analysis is that A′-pro, when it fails to be licensed via agreement may be licensed as an intermediate link in an A′-chain, as long as other conditions on A′-chains are satisfied. The plausibility of this analysis naturally depends on the approach to empty category licensing which is adopted. Up to now, when discussing empty categories, I have used the term "licensing" fairly loosely, often referring to very different sorts of constraints or operations under this rubric. Therefore, as a first step in developing the analysis of parasitic gaps suggested above, I will try to clarify what is included under the heading "licensing constraints" and which of these constraints are relevant for the analysis.

As in chapter two, I continue to adopt the typology of empty categories based on the features [±anaphor, ±pronominal] as proposed in CC and given in (13).

13) -anaphor, -pronominal = variable
-anaphor, +pronominal = pro
+anaphor, -pronominal = NP-trace
+anaphor, +pronominal = PRO

In the category of constraints which apply to empty categories in particular are those which govern their "identification". In LGB and CC where the identity of an empty category is determined functionally, along the lines of the informal statements in (14), "identification" had a rather literal interpretation.

14) "...an EC is a variable if it is in an A-position and is locally A′-bound. An EC in an A-position that is not a variable is an anaphor. ...a pronoun is either free or locally A-bound by an antecedent with an independent θ-role..." (CC, p. 35)

I depart from the functional determination approach by assuming that features are assigned freely to empty categories when they enter the derivation[6], that features may not change during the course of a derivation, and that the distribution of the feature matrices in (13) is determined by a variety of constraints, only some of which are particular to categories without lexical content. Some elements of the functional definitions given informally in (14) must be retained, e.g. (15).[7]

15) A variable must be locally A′-bound.

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6. See Brody (1984) for a theory of ECs based on the random assignment of features.

7. The definition of "variable" given in (i) is from LGB and that in (ii) is from Borer (1981).

i) α is a variable iff α is locally A′-bound.
ii) [e] is a variable iff it is bound by an operator.

The biconditional in both definitions is too strong, as shown by sentences such as (iii) (=(254i), KoL).

iii) Who$_i$ does [PRO$_i$ getting his teeth filled] generally upset t$_i$

PRO in (iii) is locally bound by an operator and, by (i) and (ii), should be a variable. The same point is made in Brody (1984) where it is argued that "variable" should be disassociated from the features [-anaphor, -pronominal], with (i) being adopted as an interpretive principle. Thus, for Brody PRO in (iii) is interpreted as a variable, as is t$_i$ in (iv), the trace of NP movement.

iv) Who$_i$ t$_i$′ was seen t$_i$

I leave open for now whether this and other such statements are derivable from other aspects of the theory. See §3.2 for further discussion of (15).

In addition to these considerations, it is necessary to specify the means of determining the phi-feature content of an empty category. The phi-feature content of a variable or NP-trace is determined by its antecedent, i.e. the head of its maximal A′-chain or A-chain, respectively. Since the ECP governs the relation between an antecedent and its trace, it is implicated in the identification of non-pronominal empty categories. (For discussion of the ECP as an identification constraint, see LGB, KoL, Jaeggli (1980), and Stowell (1985) among others.) The pure pronominal pro is identified by agreement, either under government by "rich" AGR in null subject languages and, if the proposals ofthe preceding chapter are correct, by an agreement chain when pro is in the SPEC of a predicate.[8] The identification of PRO is the subject of control theory, about which I will have nothing to say.

There is another type of empty category which has come to play an increasingly important role with respect to the ECP. This is the intermediate trace, t_i' in (16b).

16) a. Who do you think that Bill likes?
b. who$_i$ [you think [$_{CP}$ t_i' that [Bill likes t]]]

---

8. The option of licensing pro as an A′-bound variable a la Cinque (1986) and Obenauer (1984) is inconsistent with the analysis I propose.

Little is usually said about these empty categories (which I will hereafter refer to as "intermediate ECs") and I will keep to this tradition, discussing only those aspects of their distribution which are relevant to the parasitic gap analysis I wish to propose. Consider the properties which intermediate ECs are required to exhibit: given the L&S/Barriers approach to the ECP, they must be subject to the ECP at least when they are members of an adjunct chain. They must not be arguments since arguments, by definition, do not appear in A′-positions.[9] Finally, they must not be operators on the basis of the principle of Full Interpretation (FI).[10] This follows if, in a structure such as (17) where α_i is an intermediate EC with operator status,

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9. Without this assumption it is not clear to me that a representation such as that in (i) could be ruled out.

i) $wh_i \ldots [_{CP}\ t_i'\ [_{IP}\ \ldots t_i \ldots\ ]]$
[+arg] [-arg]

Assuming that the position of t_i is case-marked, the argument EC receives case by virtue of being in a case-marked chain, presumably a necessary loosening of the case-marking requirement on variables given the croire/ ritenere facts. For further discussion of the croire/ritenére facts, see §4.4; see also Kayne (1978/80), Rizzi (1978/82), Pollock (1984), Shlonsky (1987) and Epstein (in progress) for discussion.

10. But see Contreras (1986) for a detailed analysis of sentences such as (i) which posits a structure exactly like that in (17), i.e. (ii).

i) Who did you leave London without visiting?
ii) $[_{CP}\ who_i\ [_{IP}\ \ldots\ [_{PP}\ O_i\ \ldots\ e_i\ ]]]$

This analysis is also mentioned in Barriers and attributed to L. Rizzi.

17) $wh_i \ldots [\ \alpha_i \ldots t_i \ldots\ ]$

wh_i does not bind a variable and thus is not licensed, since the only variable is bound by α_i.[11]

Returning now to what I have previously called the null operator in parasitic gap constructions, the following question arises: given that this pro is not licensed to head a chain by the pro licensing mechanism of chapter two, is there anything to prevent it from being licensed as an intermediate EC? Even in OWM constructions operator pro must not be an argument and there is no reason to assume that it is one in parasitic gap constructions. As for its status as an operator, the hypothesis under investigation is that A'-pro may have operator status only when licensed by agreement. The requirement that intermediate ECs must be subject to the ECP would seem to be problematic, since pronominals are not subject to the ECP. However, the problem is only apparent: consider the SS representation of (18a), given in (18b) in a simplified form but with all the intermediate ECs required and allowed.[12]

18) a. Who did you leave London without visiting?

b. $[_{CP}$ who$_i$ $[_{IP}$ you INFL $[_{VP}$ t_i^5 $[_{VP}$ $[_{VP}$ left London $[_{PP}$ t_i^4 without $[_{CP}$ t_i^3 $[_{IP}$ PRO $[$ t_i^2 $[$ visiting t_i^1 $]]]$...

---

11. This interpretation of the principle of FI corresponds to half of the Bijection Principle of Koopman & Sportiche (1982), the requirement that no more than one operator may bind a single variable.

12. Notice that there is an intermediate EC in the SPEC of PP; I argue that there is no adjunction to PP but that the SPEC of PP may be a landing site for movement in §4.5.

The trace in argument position, t_i^1, is τ-marked prior to the point in the derivation when the ECP is checked. Since t_i^1 is an argument, the intermediate ECs t_i^2 - t_i^5 are not required to be present throughout derivation and may delete[13] prior to the application of the ECP filter. As far as arguments are concerned, it is of no importance whether intermediate ECs are subject to the ECP or not, so long as they are not present at LF. We might therefore assume that A'-pro in a parasitic gap construction deletes in the mapping from SS to LF.

(A digression on terminology: to avoid confusion I will hereafter refer to the pro in SPEC of CP in OWM constructions as "operator pro" and to the pro in parasitic gap constructions as "A'-pro". I will use the term "null operator" only to refer to comparable entities in analyses other than my own and to refer to the general approach within which my analysis falls, e.g. "the null operator hypothesis".)

Two questions concerning the deletion hypothesis immediately arise: must A'-pro delete prior to LF and are there independent constraints which would prevent its deletion? To answer the first question, we must look at the LF representations (given schematically in (19)) which the grammar would assign to parasitic gap constructions such as those in (10) if the pro did not delete.

19) a. Wh_i ... [$_{VP}$ [$_{VP}$ ... t_i [$_{PP}$ ... pro_i ... e_i]]]

---

13. Must delete if they are not marked [+τ] at some point.

b. an artist $[_{CP}$ wh$_i$ $[_{IP}$ $[_{NP}$ pro$_i$ ... e$_i$] ... t$_i$]]

Since the ECP does not apply to pronominal empty categories the structures could not be ruled out for ECP reasons. Because pro in these structures is not identified by agreement, it might be that its presence at LF will be ruled out by the principle of FI. Let's consider this last point more closely: if the principle of FI were interpreted as a filter on LF representations which ruled out those containing elements which had not been licensed at any level in the derivation prior to the application of the filter, then the pros in (19) would be allowed, as they are licensed as intermediate ECs at SS. However, the discussion of FI in KoL suggests that it should be interpreted as ruling out representations containing elements which receive no interpretation; thus, expletives are not allowed at LF and expletive replacement is motivated. (See KoL, p. 179.) Similarly, pro in (19) would receive no interpretation and would necessarily be deleted; the same would be true for all intermediate traces of wh-movement of arguments. I will adopt this latter interpretation of FI with the consequence that A'-pro in parasitic gap constructions must delete in the mapping from SS to LF.

As for the second question, are there independent constraints which would prevent the deletion of A'-pro?, the answer is probably not. Neither the θ-Criterion nor the Projection Principle (nor even the Extended Projection Principle) apply to intermediate ECs. The remaining constraint which

might apply is that governing recoverability of deletion. The pros in (19) are not licensed to bear phi-features but they do bear (at least) the feature [+pronominal] and it could be argued that this would be sufficient to prevent deletion. I will assume that this is not the case and that there is no bar to deleting the A′-pros in (19). Under the proposed analysis, the grammar assigns SS representations as in (20) and LF representations as in (21) to parasitic gap constructions such as those in (10).

20) a. Which article$_i$ did you [$_{VP}$ [$_{VP}$ review t_i [$_{PP}$ without [$_{CP}$ pro$_i$ [PRO reading e_i]]]]]

b. an artist [$_{CP}$ who$_i$ [$_{IP}$ [$_{NP}$ pro$_i$ [close friends of e_i]] admire t_i]]

21) a. Which article$_i$ did you [$_{VP}$ [$_{VP}$ review t_i [$_{PP}$ without [$_{CP}$ [PRO reading e_i]]]]]

b. an artist [$_{CP}$ who$_i$ [$_{IP}$ [$_{NP}$ [close friends of e_i]] admire t_i]]

The LF representations in (21) are equivalent to those proposed for parasitic gap constructions in CC; however, the two analyses differ significantly, as should be obvious from the explication above.

3.1.3 Anaphor Reconstruction

At LF the licensing operator in a parasitic gap construction directly binds both the trace of licensing operator movement and the trace of null operator movement. Evidence from Kearney (1983), given in (22), suggests that the relation

between the pair (wh, t) and that between (wh, e) are not symmetrical in some important respect.

22) a. Which books about himself did John file t before Mary read e
b. * Which books about herself did John file t before Mary read e

It is suggested in Barriers that null operators block reconstruction. In order to adapt such an account of (22) to the framework of this paper, it is necessary to argue (i) that pronominal categories block reconstruction and (ii) that reconstruction is an SS phenomenon (as is argued by Barss (1986), for example). The data concerning anaphor reconstruction and null operator constructions are not as clear-cut as the data in (22) suggest, however. For some speakers (23a) is worse than (23b) and as bad as (22b).

23) a. * Which picture of herself did John leave before Mary saw t
b. ? Which picture of Susan did John leave before Mary saw t

If these judgements are correct, then it seems that reconstruction into adjunct clauses is blocked even when extraction of arguments from within such clauses is permitted, as in (23b). This could be explained by assuming that such adjunct extractions are actually derived by base-generating an overt operator in the matrix [SPEC, CP] and moving a pro into the embedded [SPEC, CP].[14] However, there are reasons to doubt

14. A version of this proposal, involving a null operator which is not pro, is credited to L. Rizzi in Barriers.

that this is the correct approach. First, this derivation of (23) does not account for the relative grammaticality of (24).

24) ? Which picture of himself did John leave London before destroying t

Secondly, note that null operator constructions do not uniformly prohibit reconstruction.[15]

25) a. Pictures of himself are difficult for John to look at.
b. Those pictures of himself are too embarrassing for John to show us.
c. The pictures of himself that John likes will go on sale tomorrow.
d. The pictures of himself for John to take home are on the desk.

26) a. * Mary gave Susan some pictures of himself for her son to hang in his room.

Finally, it is not obvious why null operators should prohibit reconstruction when overt operators do not, as illustrated below.

27) a. What John found in the package was an incriminating picture of himself.
b. The pictures of himself which your son has picked out will be sent to you next week.

---

15. Topicalization allows reconstruction, as shown in (i), but it is not obvious that topicalization involves null operator movement.

i) Pictures of himself, John likes t

Comparatives allow reconstruction in some cases.

ii) More pictures of himself than John cared to think about were handed out to his friends.
iii) * I sold more pictures of himself than John sold.

The data in (23) - (27) indicate that (22) cannot be taken as direct evidence that A′-pro has the property of blocking anaphor reconstruction. The topic remains open for further investigation.

3.2 Conditions on Parasitic Chains

3.2.1 Conditions on Variables

Preceding sections have focussed on licensing the A′-pro in a parasitic gap construction, but there are significant issues to be resolved concerning the licensing of the parasitic gap itself. In §3.1.2 it was noted that certain aspects of the LGB/CC contextual definition of "variable" needed to be retained for this analysis, in particular, the requirement in (15) that a variable be locally A′-bound. Something like (15) is necessary whatever one's analysis of empty categories and parasitic gap constructions simply to rule out non-sentences such as (28). The constraint in (15) also seems to be sufficient to rule out (29).

28) * John likes e

29) * I_i knew [which paper$_j$ John had written t_j] [without even PRO_i reading e_j]

(29) exemplifies the well-known fact that a parasitic gap construction will be ungrammatical if the adjuncts containing the parasitic gap is base-generated in a position outside the SS c-domain of the overt operator. According to the analysis I have proposed, the variable e_i will be locally A′-bound at SS

by the A′-pro in the adjunct (or an intermediate trace left by movement of the pro to SPEC). By LF, however, the A′-pro (and any other intermediate ECs in the parasitic domain) will have been deleted and the variable will no longer be locally A′-bound. (15) seems a sufficient constraint on the distribution of variables so long as it applies at both SS and LF. But (15) does not account for the inability of LF A′-movement to license parasitic gaps, a property mentioned in §1.3 and illustrated by the following examples. The SS and LF representations for (30b) are given in (31).

30) a. * Mary filed every paper$_i$ without reading e$_i$
b. * Who filed which paper$_i$ without reading e$_i$

31) a. who$_j$ t$_j$ [$_{VP}$ [$_{VP}$ filed which paper$_i$ [$_{PP}$ without [$_{CP}$ pro$_i$ [$_{IP}$ NP V e$_i$]]]]]

b. which paper$_i$/who$_j$ t$_j$ [$_{VP}$ [$_{VP}$ filed t$_i$ [$_{PP}$ without [$_{CP}$ [$_{IP}$ NP V e$_i$]]]]]

The parasitic gaps in (30) are locally A′-bound at SS by the A′-pro, and both locally A′-bound and operator-bound at LF by the matrix operator. (15) alone is not sufficient to rule out the sentences in (30).

Although the parasitic gaps in (30) are locally A′-bound at SS, they are not bound by an operator at SS. (Recall that in parasitic gap constructions A′-pro does not have the status of an operator.) The parasitic gap in (29) is not bound by an operator at SS or at LF. This suggests that the relevant constraint, which necessarily applies at both SS and LF, should be phrased in terms of operator-binding rather than A′-

binding, as has been argued by Cinque (1985) and Kayne (1984). (32) reformulates (15) along these lines.

32) A variable must be operator-bound at both SS and LF.

Taking this route requires that "locally" be dropped from the requirement since the local binder will generally, at least at SS, be a non-operator. Intervention of an A-binder, whether local or non-local, will be ruled out by Binding Condition C.

A feature of (32) is that it requires that the notion "operator" be relevant at the level of SS. It also requires that the shifted NP in (33) be regarded as an operator.

33) I insulted at the party yesterday, your oldest and dearest friend.

Engdahl (1981) pointed out that Heavy NP Shift (HNPS) licenses parasitic gaps, a fact which has been widely taken as evidence that the trace left by HNPS is a variable, a position tacitly incorporated into my analysis. In the discussion of conditions on null operators in §2.1 I explicitly included HNPS NPs in the category of operator. Intuitively, this does not seem to be correct, as there is surely a difference between NPs such as "your oldest and dearest friend" in (33) and quantifiers such as "everyone" and "who". The distinction that needs to be made is similar to that between "syntactic" and "semantic" variables.[16] A syntactic variable is, in general usage, an A′-

16. This distinction is made explicit in Safir (1984), which the remarks immediately below follow.

bound empty category. A semantic variable need not be an empty category, though syntactic variables are usually semantic variables as well; resumptive pronouns and other pronouns bound by quantifiers are also thought of as semantic variables.[17] Similarly, we might distinguish between "syntactic" operators and "semantic" operators, the first category encompassing all A′-antecedents and the second only those which have range-setting properties. The category relevant for the proper formulation of a constraint on variables is syntactic operator.[18] (32) is now reformulated as:

34) A variable must be bound by an A′-antecedent at both SS and LF.[19]

(34) may be taken as the identification condition for variables, the means by which their feature content is determined, on a par with identification of pro via agreement. As far as the A′-pro analysis of parasitic gap constructions is concerned, (34) is sufficient to rule out (29) and (30). It is also the second half of the answer to the question, why do parasitic gaps require an SS A′-antecedent while the gaps in

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17. A slightly different, but related, approach is found in Brody (1984).

18. Cinque (1985) argues differently on the basis of some interesting data concerning Clitic Left Dislocation in Italian.

19. Longobardi (1985) argues that the relation between an operator and variable is best characterized as "the variable is in the scope of the operator" rather than "the operator c-commands the variable"; "c-command" is naturally incorporated into the definition of "binds". This point, and some of Longobardi's data are discussed in chapter four.

OWM constructions do not? Operator pro in OWM constructions is identified by agreement with an overt NP; the variable bound by operator pro in these constructions therefore satisifes (34) by being in the scope of an A′-antecedent capable of identifying it in turn. A′-pro in parasitic gap constructions is not identified and may not identify a variable; SS A′-movement is thus required to provide a suitable A′-antecedent for the parasitic gap.

3.2.2 Subjacency

One of the most interesting and problematic aspects of parasitic gap constructions is what was at first taken to be their immunity to island conditions, discussed briefly in §3.1. The canonical examples of parasitic gap constructions from §3.1 are repeated in (35) and given schematically, with A′-pro represented as "pro_i", in (36).

35) a. ? Which article$_i$ did you review t_i without reading e_i
b. ? an artist$_i$ who$_i$/that close friends of e_i admire t_i

36) a. $wh_i \ldots t_i \ldots [_{PP} \ldots pro_i \ldots e_i \ldots]$

b. $wh_i [_{IP} [_{NP} \ldots pro_i \ldots e_i \ldots] \ldots t_i \ldots] \ldots$

The relation between the operator and parasitic gap (indicated with arrows) violates the Adjunct Condition in (36a) and the Subject Condition in (36b), both sub-cases of the CED. Some versions of the null operator hypothesis account for these facts by arguing that, since the CED is a condition on move-

ment, it applies only to the chains α and ß in (37).

37) $wh_i \ldots t_i \ldots [_{XP} \ldots O_i \ldots e_i \ldots]$
$\quad\quad \backslash_____/ \quad\quad\quad\quad\quad \backslash_____/$
$\quad\quad\quad \alpha \quad\quad\quad\quad\quad\quad\quad ß$

Extraction may not be allowed out of XP, but since no instance of movement crosses that barrier[20] no violation is incurred. Nevertheless, there are locality constraints which govern the relation between the "real" chain and parasitic gap chain, for example, the constraint governing the relation between variables and antecedents proposed in the preceding section. While this constraint accounts for the failure of LF A′-movement to license parasitic gaps and the ungrammaticality of (38), it has nothing to say about the ungrammaticality of (39).

38) * I_j knew [which article$_i$ John had written t_i] [without even PRO_j reading e_i]

39)?* the man who$_i$ I decided to interview t_i [without calling you [before I spoke to e_i]]

In (39) the adjunct hosting the parasitic gap is embedded in another adjunct. If the SS representation is as in (40a), then the sentence can be ruled out as a Subjacency Condition violation. However, if the representation is as in (40b), there is nothing yet in my analysis to explain its ungrammaticality.

40) a. $\ldots who_i \ldots t_i\ [_{PP_2} \ldots pro_i \ldots [_{PP_1} \ldots e_i \ldots]] \ldots$
b. $\ldots who_i \ldots t_i\ [_{PP_2} \ldots [_{PP_1} \ldots pro_i \ldots e_i \ldots]] \ldots$

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20. Or "barriers" -- a Subject Condition violation in the Barriers framework involves crossing two barriers, NP and IP.

In Barriers this problem is dealt with by requiring that the null operator be 1-subjacent to the "real" gap. This locality constraint is formulated as a necessary condition on "chain composition", the process by which the parasitic chain is licensed. According to the Barriers analysis, a parasitic gap construction has the structure in (41)

41) a. $wh_i \ldots t_i \ldots [_{xp} \ldots O_i \ldots e_i \ldots]$

and contains three identifiable A′-chains: the two movement-derived A′-chains <wh, t> and <O, e> and the "composed" chain <wh, t, O, e> (intermediate ECs omitted). The Barriers analysis is discussed in more detail in §3.2.4.

Instead of adopting a construction-specific process of chain composition[21] linking two distinct A′-chains, I propose to regard a parasitic gap construction as one which contains a single A′-chain with a single head; I will refer to these as "complex chains". Like any other SS A′-chain, a complex chain must meet the Subjacency Condition. No parasitic gap-specific condition or process applies. Naturally this approach requires adjustments in various aspects of the theory, only some of which will I argue for explicitly. One point in particular deserves attention that it will not receive here, that is the

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21. Although there is another instance of a non-movement-derived chain in Barriers, i.e. the "extended" chain which allows proper government of the NP-trace in passive and raising constructions, the Subjacency Condition is not one of the conditions which govern the formation of that chain. Therefore, the two process must be regarded as distinct and construction-specific.

necessary assumption that A′-chains (at least) may be derived by a process of chain formation distinct from movement. It is sufficient for the complex chain analysis that this be a <u>possible</u> means of deriving chains, but it is not necessary that it be the only means available; the analysis is consistent with the position that both movement and chain formation are options in the grammar. This position is unfortunately rather redundant, but I will have little else to say in its defense at this time.[22]

The ungrammaticality of (39) arises as a result of a Subjacency Condition violation, but there is an aspect of the <u>Barriers</u> (p.30) version of the Subjacency Condition, as given in (42), which makes it unclear that the condition applies straightforwardly to the complex chain in a parasitic gap construction.

42) If (α_i, α_{i+1}) is a link of a chain, then α_{i+1} is (1-)subjacent to α_i.

43) ß is n-subjacent to α if there are fewer than n+1 barriers for ß which exclude α.

The problem lies in the explicit characterization of a chain as a sequence which surfaces in (42) in the reference to a chain link as (α, α+1). Forming a sequence from a complex

---

22. As discussed in chapter two, I analyze resumptive pronoun structures as involving an operator which binds the variable at LF. These structures differ from cases of movement in that the former do not involve SS A′-chains. If the operator-variable relation is dependent on chain formation at LF, then this is another instance of chains being formed without movement.

chain is not difficult in the cases where there is only one parasitic gap, but in a sentence such as (44a), it is more difficult to think of the complex chain as a sequence.

44) a. a man that [everyone who meets e_i] admires t_i [after visiting e_i even once]
b. a man that everyone admires t_i [after visiting e_i even once]
c. a man that [everyone who meets e_i] admires t_i [after visiting his home even once]

(44a) is admittedly worse than the two possible variants with only one parasitic gap instead of two shown in (44b) and (44c), but I would attribute this to the fact that the complex chain in (44c) is broken at two different points by a single barrier, rather than at one point, as is the case in (44b) and (44c).[23] Increased complexity arising from the greater number

---

23. The question of whether barriers intervening at different points in a chain cause the grammaticality of the construction to decrease cumulatively is a difficult one to answer. In Barriers Chomsky proposes that violations are cumulative on the basis of Italian bounding facts discussed in Rizzi (1982). Double wh-island violations, such as (i), are more degraded than the crossing of a single wh-island, which in Italian is acceptable in most cases.

i) what$_i$ did you wonder [$_{CP}$ who knew [$_{CP}$ who saw t_i]]

There seems to be no accumulation effect in (ii), but the weak, perhaps non-existent, barrierhood of infinitivals may be responsible for its unexpected grammaticality.

ii) a problem that I didn't know who to ask how to solve

Note that the VMH of Barriers cannot be responsible for the acceptability of (ii) as no subject wh-phrases are involved. See chapter four for more on this point and also the discussion of (67d) in §3.2.4.

of gaps is also likely to be a factor. In any case, I do not think (44a) should be strongly ruled out.

The A′-pro in the subject NP of (44a) will be 1-subjacent to t_i, the A′-pro in the adjunct and the parasitic gap in the adjunct; in fact, it will be 1-subjacent to every member of the chain which is c-commanded by the subject. Therefore, if a sequence can be formed from the complex chain which creates a link between the A′-pro in the subject NP and one of the chain members to which it is 1-subjacent, the complex chain will be licensed. While it seems somewhat counter-intuitive, it is possible to consider the complex chain in (45a), which is the structure of (44a), as the sequence in (45b).

45) a. $wh_i \ldots [pro_i^1 \ldots e_i^1] \ldots t_i \ldots [pro_i^2 \ldots e_i^2]$

b. $\langle wh, t, pro^1, e^1, pro^2, e^2 \rangle$

The Subjacency Condition in (42) applies to the chain link $\langle e^1, pro^2 \rangle$. An alternative, suggested by N. Chomsky, is that there are two complex chains in (44a), one corresponding to the complex chain in (44b) and one to the complex chain in (44c). In either case, I assume that the process of chain formation which produces such chains is free and that cases of overgeneration can be ruled out by independent constraints.

This approach to A′-chain formation does not permit local binding to be a condition on A′-chain links. While local binding is explicitly a condition on A-chains in KoL, it is

clearly meant to apply to A′-chains in the following excerpt from LGB:

> We may think of the rule Move α a bit more abstractly as expressing the configuration [(i)]:
>
> i) α locally binds ß and is not in a θ-position
>
> To say that α locally binds ß is to say that α and ß are coindexed, α c-commands ß, and there is no τ coindexed with α that is c-commanded by α and c-commands ß. (p.59)

See Epstein (1985) and Rizzi (1982) for discussion of local binding in A-chains; the question of whether it is also a necessary condition on A-chains, as well as other questions which arise, I leave open for future research.

An advantage of the barriers approach to bounding effects is that it permits the adoption of a one barrier vs. two barriers distinction to quantify levels of deviance. Since Barriers, Browning (1986) and Belletti & Rizzi (1986) have exploited the one barrier/two barrier distinction to account for the relative well-formedness of extraction from some adjuncts, such as those in (46), as compared with extraction from subjects which is a clear case of a two barrier violation.

46) a. Which car is it time [for John to wash t]
b. Who did John buy a suit [to impress t]
c. What did John wonder [how to fix t]

In Browning (1986) I suggested that the sentences in (48) all represent 1-barrier subjacency violations. While judgements differ somewhat among speakers, it seems generally to be true

that (46b) is worse than (46a,c), which are perfectly grammatical to many speakers. All the sentences in (46) are clearly better than (47).

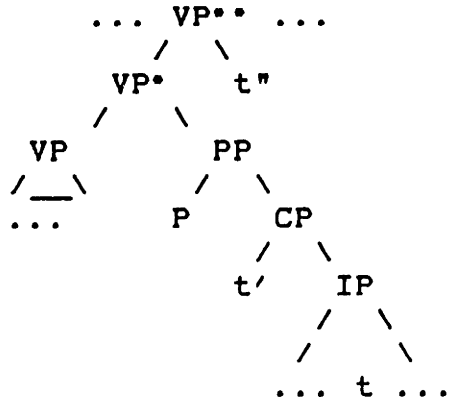
47) who did pictures of t fall on Bill?

Another reason for favoring a Subjacency Condition which allows the one vs. two barrier distinction comes from the contrast between direct extraction from adjunct prepositional phrases, as in (48a,b), and parasitic gaps, as in (48c). (In general, (48a,b) are thought to be more marginal than (48c).)

48) a. Which paper did John leave London [before reading t]
b. Which paper did John call Mary [before reading t]
c. Which paper did John read t [before filing e]

Under the definition of n-subjacency in (43), the A′-pro in (48c) is 1-subjacent to t. But consider (49), which represents a segment of the SS representation of (48a,b).

49)



t′ is included by a barrier, PP, and by a segment of a category (VP*) which dominates a BC. t" is excluded by both PP and

the segment VP*. If the Belletti & Rizzi (1986) proposal that lower segments of a category may inherit barrierhood is true for all segments of a category (or at least, all segments other than the topmost) rather than the lowest segment only, we could argue that VP* becomes an additional, albeit weak, barrier for t'.[24] Sentences involving direct extraction from adjunct PPs, such as (48a,b) are correctly predicted to be less grammatical than parasitic gap constructions. But notice that, in order to capture the contrast in (48) it is necessary to introduce the concept of a "weak" barrier.[25]

Alternatively, we might reject the Belletti & Rizzi hypothesis in favor of the assumption that adjunction to categories is allowed only when movement originates from a source included by the category; in (49), adjunction to the category VP (= VP+VP*) is ruled out for extraction from within PP.[26]

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24. This is consistent with B&R who assume that crossing a barrier created by a segment results in a weaker violation than crossing a full category barrier.

25. A slight variation of this approach would be to argue that only two barriers induce subjacency violations. Then (46c) is well-formed as only one barrier is crossed. The VP* segment in (49) counts as a second barrier, but a weak one, suggesting that extraction from PP adjuncts will incur a weaker violation than extraction from subjects. It is still necessary to specify weak vs. strong barriers. Finally, the marginality of parasitic gaps would not be due to their status as a 1-barrier subjacency condition violation, since single barriers do not induce violations. Their marginality might be attributed to markedness of the chain formation operation, if movement is taken as the unmarked form of chain derivation.

26. Another approach is to say that PP adjuncts are sisters of I', in which case there is no possible adjunction site for extraction; see chapter three for arguments that the PPs in the text examples are VP-adjuncts.

Movement from within the adjunct crosses PP and IP yielding a two barrier violation in the case of (48a,b).[27] Parasitic gap constructions, (48c), are less marginal by virtue of being a one barrier violation. For further discussion of these issues, see chapter two.

3.2.3 SS Indexing of A′-positions

The question of whether free indexing of elements in A′-positions should be allowed, and if so, at which level(s), arises for almost every recent analysis of parasitic gap constructions.[28] For now, I will restrict the discussion to the question of whether wh-operators in A′-positions can be freely indexed at SS, leaving aside the question of whether phrases base-generated in left-dislocated or topicalized positions are indexed.

In CC, Chomsky argues that wh-operators base-generated in A′-positions must not receive an index at SS: there is no indexing at DS and free indexing at SS applies only to A-positions. Within the CC framework if wh-operators base-generated in A′-positions were indexed at SS two undesirable

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27. The issue then is to decide whether extraction from within PP adjuncts is a violation comparable to extraction from within subjects. This is the assumption which underlies the CED and Longobardi's (1984) version of the connectedness condition. However, some speakers find some adjunct condition violations weaker than subject condition violations.

28. This section owes its existence to a discussion with Sam Epstein and Juan Uriagereka. See Epstein (in progress) for further discussion of the issue of SS indexing of A′-positions.

results would follow: resumptive pronoun constructions would license parasitic gaps and island violations would be derivable with only the degree of marginality associated with resumptive pronoun constructions (i.e little or no marginality in resumptive pronoun languages, a more significant degree in non-resumptive pronoun languages). The formulation of the Subjacency Condition which I have proposed removes the argument against free A'-indexing at SS based on island violations. Let's consider the evidence bearing on the remaining argument.

The following sentences, from E. Torrego, are offered in CC as evidence that resumptive pronouns do not license parasitic gaps.

50) a. el reloj de que me hablaste, el cual han conseguido arreglar t [sin mover e], ha quedado muy bien

b. * el reloj de que me hablaste, que lo han conseguido arreglar [sin mover e], ha quedado muy bien

'the clock you spoke to me about, which they got to fix (it) without moving e, now works very well'

These sentences differ in that (50b) has a resumptive pronoun in the position of the gap in (50a). From the ungrammaticality of (50b), Chomsky argues that the operator associated with resumptive pronouns is not indexed at SS and therefore is not able to bind a parasitic gap.[29] Torrego points out (p.c.) that

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29. Recall that within the CC framework, a parasitic gap is base-generated as pro and becomes a variable under local A'-binding by a coindexed operator at SS.

the star on (50b) should be taken as indicating contrast, not an absolute degree of deviance, since (50b) is not as ungrammatical as, for example, an ECP violation.[30] This is significant since, by the CC analysis, (50b) should be a rather severe violation.

There is another possible derivation of sentences such as (50b) involving movement of the operator from the adjunct-internal position. This derivation is illustrated schematically in (51).

51) a. DS: $[_{CP}\ [_{IP}...\text{pronoun}...[_{PP}...wh_i...]]]$

b. SS: $[_{CP}\ wh_i\ [_{IP}...\text{pronoun}...[_{PP}...t_i...]]]$

This derivation is suggested by the grammaticality of sentences such as (52a), although the ungrammaticality of (52b) is a complicating factor.

52) a. the article that I went to England without reading e
b. * the man to whom I went to England without speaking e

In CC the ungrammaticality of (52b) is taken as evidence that adjuncts are absolute islands and that (52a) is derived, not by movement, but by a null resumptive pronoun strategy. This approach fails to account for the island effects observable within the adjunct clause, as illustrated in (53).

53) a. the man that I went to England without knowing who had spoken to e

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30. Torrego suggests that (50b) be given ??.

b. the man that I went to England without knowing what to bring to e
c. the article that I went to England before hearing about a plan to publish e

It is also not obvious, within the CC framework, how to make the assumptions needed to license (52a) as a null resumptive pronoun compatible with the assumptions necessary to rule out (50b).[31]

In Barriers these considerations lead to the proposal that (52a) is derived via movement (along the lines of (51)). (52b) is ruled out by a constraint on possible adjunction sites for PPs. Once movement from within adjuncts is permitted for sentences such as (52), it cannot be ruled out as a possibility for (50). Thus, within the Barriers framework, the ungrammaticality of (50b) is not an argument against the free indexing at SS of wh-operators base-generated in A′-positions.

Cinque (1986) reaches this same conclusion (i.e. that (50b) does not constitute an argument against indexing of wh-operators in A′-positions at SS) by arguing that what rules out (50b) is a constraint on "backwards pronominalization," which is also responsible for the ungrammaticality of (54b).

54) a. They managed to fix the wall without moving the clock.
b. * They managed to fix it$_i$ without moving the clock$_i$.

The existence of an alternative explanation for the ungrammaticality of (50b) makes the data in (50) essentially irrele-

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31. But see Cinque (1986), (1987) for a detailed working out of these issues.

vant to the question of indexing A′-operators. If the only thing ruling out (50b) is the "backwards pronominalization" constraint and if A′-operators may be freely indexed at SS, then resumptive pronouns should license parasitic gaps in constructions where backwards pronominalization is allowed. This seems to be the case, as illustrated below.

55) a. Dovranno convocare anche il poliziotto che lo ha arrestato prima di poter interrogare Gianni
'they will also have to summon the policeman who arrested him before they will be able to interrogate Gianni'

b. Gianni$_i$, che dovranno convocare anche il poliziotto che lo$_i$ ha arrestato prima di poter interrogare e$_i$, ...
'G., who they will also have to summon the policeman who arrested him before they will be able to interrogate e, ...'

The grammaticality of (55a) indicates that backwards pronominalization is allowed and, as predicted, the gap is also licensed. Within Cinque's framework it isn't really correct to say that, in (55b), the resumptive pronoun licenses the parasitic gap. It is rather the operator itself which licenses the gap by virtue of an SS A′-chain-formation algorithm. It is therefore crucial to Cinque's analysis that such operators, base-generated in A′-positions, bear an index at SS.

The grammaticality of (55b) does not "prove" that wh-operators base-generated in A′-positions are indexed at SS. While (55b) is consistent with an analysis such as Cinque's which depends on that assumption, (55b) is also consistent with the derivation in (51) within the Barriers framework.

Neither approach can handle the contrast between (55b) and (50b) without some additional proviso regarding backwards pronominalization. The data which have been discussed so far can give insight into the question of whether or not wh-operators base-generated in A'-positions are indexed at SS only insofar as the competing hypotheses are embedded in theories and the question can be answered only by comparing theories, or fragments of theories, which differ on this point. The extent to which an analysis succeeds in offering interesting explanations for a wide range of phenomena related to the question is the extent to which we have a basis for answering it in the negative or the affirmative.

Cinque's approach will be weakened if there is a construction such that the following hold of it: (i) a gap is bound by an operator base-generated in an A'-position; (ii) the structural relationship between the operator and gap fulfills all the conditions which Cinque's analysis imposes; (iii) the construction is ungrammatical. Before discussing a construction which, I believe, has these characteristics, I will briefly summarize Cinque's analysis of parasitic gaps.

Cinque (1986) argues that in certain contexts where A'-movement is impossible, A'-c ains may nevertheless be formed by means of a "null resumptive pronoun" strategy. Two assumptions are crucial to this approach: (i) wh-operators may be base-generated in SPEC of CP and indexed by SS and (ii) pro is identified (i.e. receives phi-features) under local binding by an operator (as well as by being in an appropriate relation-

ship with a "rich" AGR). Unlike overt resumptive pronouns, pro must form an A′-chain with its binder at SS in order to be properly identified. Finally, the following conditions must be met for A′-bound pro to be licensed.

56) a. pro is governed by an X° (≠ P in non-P-stranding languages)
b. every maximal projection which dominates pro but does not dominate the operator A′-binding pro must be selected in the canonical direction by an X° category

(56) is essentially a constraint on g-projection formation which incorporates both the directional aspect of Kayne (1983) and the proper government constraint of Longobardi (1984). Cinque analyzes not only parasitic gap constructions, but also constructions of "apparent NP extraction" (extraction from adjuncts) and COD constructions (tough-constructions, purpose clauses, degree clauses, etc.) as involving the A′-bound pro strategy.

Consider now the constructions in (57). (57a) contains a gap within the post-verbal relative clause subject of an ergative verb; in (57b,c) gaps are contained within NPs which have undergone Heavy NP Shift and in (57d,e) the gaps are within relative clauses in object position.

57) a. * L'uomo che arrivano [tutti quelli che conoscono e]
the man that arrived everyone who knows e
'the man that everyone who knows arrived '
b. * the candidate that Mary interviewed before the election, everyone who knew e
c. * the crime that Mary interviewed at headquarters, everyone who witnessed e
d. ?* L'uomo che ammiri [tutti quelli che conoscono e]
e. ?* the man that you admire [everyone who knows e]

It cannot be backwards pronominalization which rules out the sentences in (57) as there is no resumptive pronoun to trigger a violation. All of these constructions involve gaps inside relative clauses. Cinque assumes the [$_{NP}$ NP CP] analysis of relatives which, in concert with (56b) predicts that the sentences in (57) should be ruled out: CP is not selected (in any direction) by an X° category. This result is fine for the constructions in (57) and (58), but problematic for grammatical parasitic gaps constructions such as (58).

58) * a present that [everyone who John gives e to] admires t

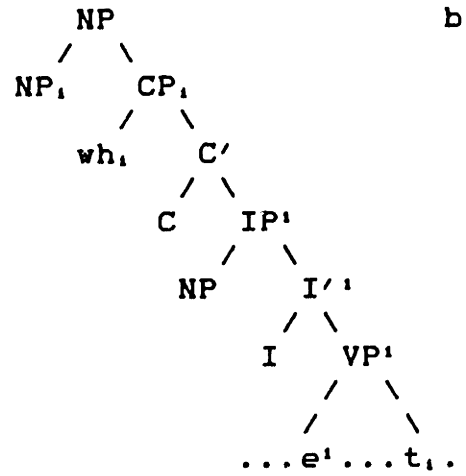
59) a man that [everyone who meets e] admires t

For Cinque, it is necessary to find a way to allow the g-projection of the parasitic gap (his A'-bound pro) in (59) to extend past the CP to the topmost NP node of the relative clause. Adopting the Vacuous Movement Hypothesis of Barriers, based on proposals in George (1980), Cinque suggests that "selected in the canonical direction by an X° category" in (56) be replaced by "properly governed", where the latter relation includes the former plus antecedent government. He then proposes to account for the facts in (57) - (59) by means of the following additional assumptions: (a) the NP and CP in a relative clause share an index only when the head of CP agrees with the NP; (b) an element in SPEC of CP may be interpreted as the head of CP, as long as C is null; (c) if the NP is co-indexed with the CP it antecedent governs the CP; (d) if C is

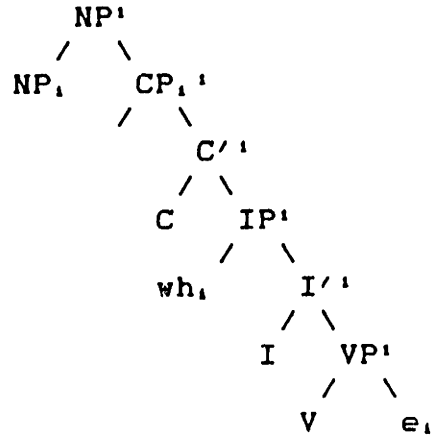
not the head of CP then IP is not selected by any X° category. Note that the agreement relation required by (a) may not be facilitated by freely assigned indices or by accidental coreference. As is described in the discussion of (60a) below, the account of (59) requires a series of instances of agreement very much like the agreement chain of chapter two.

I will now demonstrate how this analysis accounts for the relevant facts, beginning with the contrast between (58) and (59). Consider the two relative clause structures given below; (60a) corresponds to (58) and (60b) to (59). (In both structures the g-projection of the parsitic gap e^1 is indicated by superscript.)

60) a.



b.



In (60a) the head of CP is wh_i, not C. Therefore, IP is not selected by an X° category and the g-projection of e^1, the parasitic gap, may not project beyond IP. (60a) is correctly ruled out because the g-projection of the parasitic gap cannot project to a node which will allow it to connect with the g-projection of the "real" gap. In (60b) the VMH allows the sub-

ject wh-phrase to remain in situ. This means that the head of CP is C and IP is selected by C. But this only allows the g-projection of e' to project to IP. In order for it to project to NP, CP must be antecedent governed by NP. Cinque proposes that this agreement is accomplished by the following chain of agreement: the subject wh-phrase agrees with INFL, INFL agrees with C, C agrees with CP.

A problem remaining with this set of proposals is that (57d,e) are predicted to be grammatical; just as in (59) the g-projection of the gap will project to the NP dominating the relative clause. This node is selected in the canonical direction by V and, therefore, the g-projection of the gap is licensed to continue up the tree to the antecedent. Cinque notes this problem and suggests that the two means of building g-projections are incompatible when they occur in a certain order. Specifically, a g-projection which has been built on the basis of antecedent government may not be extended to additional nodes on the basis of selection by an X° category.

Cinque's basic proposal, that parasitic gaps are A'-bound pro, is interesting and offers a potentially elegant solution to many of the most problematic aspects of these, and other, constructions. However, the auxiliary assumptions needed to account for the data in (57) - (59) are ad hoc and complex. Let's consider now how the proposals made in this chapter to account for parasitic gap constructions deal with the same range of data.

The problem, as above, is to rule out sentences such as (57) and (58) while allowing (59). I will begin with (57d,e). There are two possible derivations which must be ruled out for sentences such as these: one involving movement from within the relative clause and the other involving an overt operator base-generated in SPEC of CP and a null operator (A′-pro) moved to a relative clause internal position. The latter option gives an SS representation as in (61) for sentences like (57d,e).

61) $[_{CP}$ wh $[_{IP} \ldots [_{VP} \ldots [_{NP} \ldots pro_i \ldots e_i \ldots] \ldots]]]$

If we assume that there is no SS indexing of operators base-generated in A′-positions, then (61) will be ruled out because the variable will not be identified in accordance with our earlier assumptions. If the wh-operator may be coindexed with the variable at SS, the structure will still be ruled out by the Subjacency Condition: between the link (wh,pro) at least two barriers intervene, VP and IP. It seems that, given the approach to chains and operators developed thus far in this dissertation, we may assume that elements base-generated in A′-positions bear indices at SS with no fear of overgenerating and no need for auxiliary stipulations.

One important point needs to be clarified before we accept this conclusion: I stated immediately above that if the wh-operator in (61) bears an index at SS the structure will nevertheless be ruled out by the Subjacency Condition. As formulated in the previous section, the Subjacency Condition

is a condition on chain links. The condition on variables proposed in §3.2.1, (32), requires only that a variable be bound by an A′-antecedent at SS and LF; it specifies nothing about whether the antecedent and the variable need to be co-members of a chain at SS. The question that we are now faced with is where to locate the responsibility for ruling out (61). There are two options: (i) we may stipulate that elements base-generated in A′-positions cannot be indexed at SS or (ii) we may add the requirement to (34) of §3.2.1 that the "antecedent" of a variable must be the head of the chain to which the variable belongs. It has often been argued that the null hypothesis with respect to indexing is that it be allowed to apply freely at DS and SS with other constraints ruling out improper configurations. Moreover, alternative (ii) makes explicit some of the assumptions behind the general use of the term "antecedent of a variable." Only in the case of those OWM constructions involving null operators is "antecedent" sometimes used to refer to something other than the head of the A′-chain to which the variable belongs. Therefore, it seems reasonable to opt for option (ii) and reformulate (34) of §3.2.1 as (62).

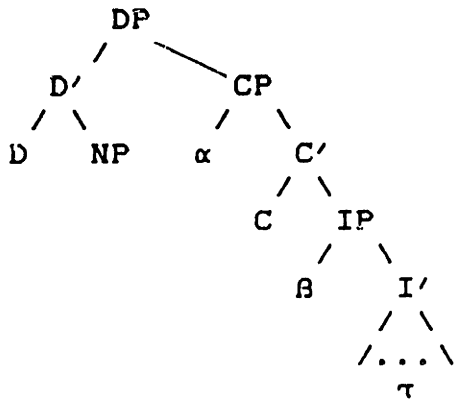
62) A variable must be a member of a chain C such that the head of C bears phi-features.

Other reformulations are possible and additional constraints governing the relationship between variables and their antecedents may be necessary to account for other phenomena, but

(62) allows us to assume free indexing and still rule out the configuration in (61) via the Subjacency Condition.

Returning to the data in (57) - (59), it must now be shown that my analysis blocks direct movement from within relative clauses, while still allowing the grammatical relative clause parasitic gap construction in (59). Cinque (1986) rules out all kinds of direct movement from within (non-wh) islands by means discussed in chapter four. Since the Barriers framework, which I have adopted, does not take an "absolute island" approach to bounding effects, the task is somewhat trickier and requires a reformulation of the definition of "barrier" as well as the adoption of the VMH. Recall that in chapter two I adopted a DP analysis of relative clauses as shown in (63) with some additional clause-internal structure given.

63)



Take first the case of (58): α is the wh-phrase who, ß is the lexical subject John, τ is the DS position of pro. Assume that no SPEC of DP is available when a relative clause is present; this is consistent with the Fukui & Speas (1986) idea that

functional categories have one and only one SPEC position if the relative clause can be regarded as a specifier. If pro moves from its base-generated position it may adjoin to the relative clause VP, but there is no other possible landing site available for it within the CP or DP. As long as it remains adjoined to VP, at least two barriers will separate the pro from the "real" gap. The complex chain in (58) will strongly violate the Subjacency Condition.

Consider (59) now: β is the wh-phrase in situ, α is A′-pro and τ is the trace of pro-movement. As long as CP is not an inherent barrier[32], only one barrier (DP) will separate A′-pro from the real gap. (DP will be a barrier in (59) since it is a subject and, therefore, not L-marked according to the definitions in fn. 10 of chapter one.) However, if relative clause CPs are exempt from inherent barrierhood, e.g. if they are L-marked, then it will not be possible to rule out extraction from within relative clauses. This is exactly the same point which led to the complications of Cinque's theory discussed above. Rather than developing a comparable set of stipulations to account for the exceptional nature of relative clause parasitic gap construcitons, I will leave the topic aside with a few final comments. In this section I have discussed two alternatives to the Barriers analysis of parasitic gap constructions, one which is compatible with free indexing

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32. "Inherent barrier" is used here to mean a barrier by virtue of being a BC, in contrast to the possibility of inheriting barrierhood from a BC.

of base-generated A′-elements and another which requires free indexing. Both approaches are empirically more adequate than the Barriers analysis, but both are unable to account for relative clause parasitic gaps without significant complications. (The latter point is true of the Barriers analysis as well.) Further development and comparison of these analyses is needed to determine which is ultimately preferable, but in any case, there seems to be little reason to retain the stipulation barring indexing of base-generated A′-elements at SS.

3.2.4 Chain Composition

A question that arises is whether the analysis outlined in the preceding sections differs substantively from the Barriers process of chain composition. The definition of "composed chain" and the subjacency restriction given in Barriers are as follows.

64) If $C = (\alpha_1, \ldots, \alpha_n)$ is the chain of the real gap, and $C' = (\beta_1, \ldots, \beta_m)$ is the chain of the parasitic gap, then the "composed chain" $(C, C') = (\alpha_1, \ldots, \alpha_n, \beta_1, \ldots, \beta_m)$ is the chain associated with the parasitic gap construction and yields its interpretation. ((130);p. 56)

65) The operator of the parasitic gap must be 0-subjacent to the head of the A-chain of the real gap. ((154);p. 67)

In order to satisfy the 0-subjacency requirement, the null operator is allowed to adjoin to the adjunct PP and remain in this adjoined position at SS in parasitic gap constructions. A null operator adjoined to an adjunct PP, as shown in (66), will be 0-subjacent to a gap within the VP, e.g. in the posi-

tion of α, but not to a subject gap in the position of ß. Note that this approach requires that adjunct PPs be included by VP rather than adjoined to VP or daughter to IP.

66) ... $[_{IP}$ ß $[_{VP}$ V α $[_{PP}$ Op $[_{PP}$ ... e ...]]]] ...

There are several problems with this approach. First, as Chomsky notes, if null operators are involved in the derivation of parasitic gaps in subjects (e.g. "the man who close friends of e admire t") O-subjacency could never be satisfied unless the null operator adjoined to or moved out of the subject NP. Both possibilities are ruled out for independent reasons within the Barriers system. Secondly, if the null operator can adjoin to PP, there is nothing to prevent it from moving on to a VP-adjoined position, as illustrated in (67).

67) a. * Which paper$_i$ t_i fell off the desk before John read e_i

b. ...$[_{IP}$ t_i $[_{VP}$ Op_i $[_{VP}$ V $[_{PP}$ e_i' $[_{PP}$...e_i...]]]]

In this position the null operator is O-subjacent to the subject gap, t_i. Thus, the O-subjacency proposal would fail at the task for which it was specifically formulated: explaining why c-commanding traces do not license parasitic gaps. Finally, given the rest of the Barriers framework, adjunction to PP allows extraction from non-arguments without any subjacency violation whatever; this point will be discussed in more detail in chapter four.

It should also be noted that the O-subjacency condition of (65) must be regarded as a new constraint within the grammar. In Barriers Chomsky remarks that O-subjacency is essentially government without c-command. However, there is no other instance in the grammar where "government without c-command" is relevant, nor is it obvious that a constraint which does not include c-command or m-command as a necessary requirement has any conceptual relation to government. (65) is intended to account for sentences such as (67); assuming that the relevant part of the SS representation of (67) is as in (66), with ß = t, only one barrier (VP) includes the null operator and excludes ß. The intervention of a single barrier results, in this case, in severe ungrammaticality as compared with the sentences in (46), in which the chain is also broken by one barrier. If (65) is to be taken as a variant of subjacency, it is not clear why this difference in grammaticality exists.[33] The Subjacency Condition which applies to members of complex chains under the analysis I am proposing is the same Subjacency Condition which applies to all members of A'-chains and, in this respect, it differs significantly from the O-subjacency requirement of (65).

Aoun & Clark (1984) correctly point out that, given the grammaticality of (68a-c), the chain composition approach

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33. However, H. Lasnik (p.c.) points out that the O-subjacency requirement on chain composition is a condition on the applicability of an operation other than Move α, something rather different than the Subjacency Condition. Thus, it might be expected to yield a different degree of ungrammaticality than a Subjacency Condition violation.

cannot account for the ungrammaticality of (68d).

68) a. quel livre$_i$ Jean a offert t_i à Pierre [sans avoir mis e_i sur la table]
b. quel livre$_i$ Jean sait [que tu as offert t_i à Pierre [sans avoir mis e_i sur la table]]
c. quel livre$_i$ Jean sait [à qui$_j$ offrir t_i t_j]
d. * quel livre$_i$ Jean a su [à qui$_j$ offrir t_i t_j [sans avoir mis e_i sur la table]

The Barriers approach predicts that both (68a) and (68d) will be grammatical since the null operator in the adjunct clause bears exactly the same relation to the real gap, t_i, in both. Consider now (69b), in which extraction over two barriers (in this case, an adjunct PP and a wh-island) induces ungrammaticality.

69) a. quelle personne$_i$ Jean a essayer [de quitter Paris [sans rencontrer t_i]]
b. * quelle personne$_i$ Jean se demande [comment quitter Paris [sans rencontrer t_i]]

The complex chain analysis of parasitic gap constructions correctly predicts that (68d), in which the chain is broken by (approximately) the same barriers[34] which rule out (69b), is also ungrammatical.

The judgements in (68) and (69) are those given by Aoun & Clark. My French informants rate the sentences of (68) and (69), relative to each other, as follows: (68c) = OK; (68a) = ?; (68b), (69a) = ?*; (68d), (69b) = *. Extraction out of PP adjuncts seems to degrade slightly under embedding even when a

34. See §3.2.2 for a discussion of the difference between direct extraction from adjuncts and parasitic gap constructions.

wh-island is not involved, e.g. (69a). Judgements are delicate since extraction out of PP adjuncts in French, as in English, is sensitive to the transitivity of the adjacent verb and other, possibly lexical, factors which are not well understood. As in English, there exist parasitic gap constructions with structures parallel to that in (68d) which are much more acceptable, especially when they involve wh-islands created by adjunct movement, as in (70).

70) La boucle d'oreille que tu sais comment reparer sans abîmer ...
'the earring that you know how to repair without damaging ...'

For further discussion of constructions like (70), see §4.5. Aspects of the Aoun & Clark analysis of parasitic gap constructions are discussed in the next section.

3.2.6 Conditions on Null Operators

In the complex chain analysis of parasitic gap constructions the A'-pro fails to be identified by agreement, the only means of identification available for a null pronominal; it is licensed, therefore, only as an intermediate ec in an A'-chain. There is no condition which applies specifically to the A'-pro in a parasitic gap construction; it must be 1-subjacent to the real gap, but this is an unexceptional subcase of the Subjacency Condition, which applies to all members of A'-chains at SS. This approach is very different from one which imposes conditions on the null operator itself, e.g.

Stowell (1985b) or Aoun & Clark (1984; hereafter, A&C). While there is no a priori reason to prefer one of these two types of approaches to the other, in this section I will discuss some evidence which suggests the conditions on null operators imposed by the analyses of Stowell and A&C are incorrect.

Stowell suggests that, in order to be licensed, a null operator receives ±wh from its local binder. Arguing that, in (71a), the real gap, t, locally binds the null operator[35] but that the wh-operator is the local binder in (71b), he accounts for the multiple interrogation reading that some speakers get for (71b).[36]

71) a. which paper did you file t without [Op reading e]
b. who did you give [Op pictures of e] to t

However, if the relevant binding relation between the null operator and its local antecedent involves c-command or m-command, it is difficult to see how either of the real gaps in (72) could be taken as the local binder.

72) a. Who did you see [a picture of t] before meeting e
b. Which paper did Bill say that, without even reading e, Mary knew you shouldn't publish t

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35. If null operators may be identified by NPs in A-positions, it is not obvious why wh-in-situ, quantifiers and other NPs do not license parasitic gaps.

36. The multiple-wh reading for sentences such as (71b) was first noticed by Robin Clark.

If the overt wh-operator is the local binder for the null operator, we would expect to get multiple interrogation readings for the sentences in (72), which is not possible. It could be argued that the null operator picks up the feature [-wh] from an intermediate trace, either adjoined to VP in (72a) or in the intermediate SPEC of CP in (72b). However, if null operators can pick up [-wh] from intermediate traces then we would expect the null operator in (71b) to be [-wh] as well. I assume intermediate traces are [-wh] based on the arguments in Lasnik & Saito (1984).[37]

Within the generalized binding framework adopted by A&C, a null operator is classified as an anaphor which occurs in an A′-position and which must be bound at SS by an antecedent in an A′-position within its governing category. The A&C analysis is similar to Stowell's in that it requires the null operator to have an antecedent; it is similar to the complex chain analysis in that it imposes a locality condition (via the governing category) on the null operator as well. The governing category of an anaphor in [SPEC, CP] is taken to be the superordinate CP containing the anaphor. In (73) all conditions are met and the sentence is grammatical.

73) Which paper did you read t [$_{PP}$ before [$_{CP}$ Op [$_{IP}$ PRO filing e]]]

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37. At least in English, complicating factors make it impossible to test whether those null operators which should have the feature +wh can satisfy selectional requirements.

(74) is ruled out because there is no A′-binder for the null operator at SS.

74) Who read which paper$_i$ [before [$_{CP}$ Op$_i$ [PRO filing e]]...

In (75) the A′-antecedent of the null operator (<u>which article</u>) is outside the operator's governing category, CP2; the sentence is correctly predicted to be ungrammatical. ((75) = A&C's (15b))

75) * Which article should I study t thoroughly [before [$_{CP2}$ [I call the author [without [$_{CP1}$ Op [reviewing e]]]]]]

Now consider the sentences in (76).

76) a. which car did John know how to fix t without permanently damaging e
b. which test did you claim to know how to administer t before even examining e
c. which vegetable did you wonder whether to peel t before cooking e

All of these sentences have essentially the structure shown schematically in (77).[38]

77) wh$_i$ ... [$_{CP2}$ wh$_j$ ... [$_{CP1}$ Op$_i$ ...

According to the Aoun & Clark analysis, the governing category for the null operator is CP2, not the matrix CP. These sentences should, therefore, be as ungrammatical as (75). This is clearly not the case; in fact, (76a-c) exhibit the level of

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38. (76c) differs from (76a,b) in that <u>whether</u> is a complementizer rather than an XP in [SPEC, CP], at least at SS. This is irrelevant for the following discussion.

mild ungrammaticality usually associated with non-CED-type subjacency violations.

It might be argued, following essentially Bordelois (1986), that a controlled PRO does not constitute an accessible subject and that, in cases such as (76a-c), the governing category must be extended to the matrix CP, i.e. a governing category must include the lexical "head" of an NP...PRO control sequence. In this case, (76a-c) should be acceptable while (78) should be ruled out.

78) which car did you wonder how Bill had repaired t without permanently damaging e

While (78) is worse than (76a-c), it does not seem to be as ungrammatical as (75), a fact which remains unexplained under the Aoun & Clark analysis. Notice, however, that the difference in ungrammaticality between (76a-c) and (78) is comparable to the difference in ungrammaticality between (79a) and (79b).

79) a. which car did you wonder how to repair t
b. which car did you wonder how Bill had repaired t

A reasonable hypothesis is that the difference in grammaticality between (76a-c) and (78) may be attributed to the well-known observation that finite sentences incur more severe Subjacency Condition violations than infinitivals.

Assuming, as I have, that there is a single, complex A′-chain in parasitic gap constructions leads to the prediction that (76a-c) and (78) will be roughly as grammatical as simi-

lar sentences with direct extraction from PP adjuncts, such as those below.

80) a. which alarm did John know how to escape without triggering e
b. which test did you claim to know how to relax before taking e
c. which medicine did you wonder whether to lie down before taking e
d. which alarm did you wonder how Bill had escaped without triggering e

While the sentences in (80) are somewhat worse than their parasitic gap counterparts, this is predicted by my analysis, since direct extraction crosses an additional weak boundary. (See the discussion in §3.2.2.)

It seems that the strong ungrammaticality of (75) may involve factors unrelated to the null operator. Consider that the configuration of adjuncts in (75) is somewhat deviant even in a non-parasitic gap construction.

81) I studied that article thoroughly before I called the author without reviewing it.

The complicating factor here seems to be the compatibility of various prepositional adjuncts with other embedded adjuncts. Obviously, the temporal prepositions before and after are mutually incompatible. Only after seems to be compatible with embedded while, however.

82) I read your letter [after/*before grading papers [while listening to Mozart]]

The status of sentences with before/after embedded under while is less clear.

83) I read your letter [while listening to Mozart [after/before grading papers]]

The problem with assessing (83) is that the interpretation seems to be the same whether the second adjunct is embedded or not. Therefore, it is difficult to tell whether the embedded reading is really available. While before and without seem to be incompatible in the order shown in (75), the reverse order of embedding is somewhat better.

84) I decided to leave [without calling you before I spoke to John]

In this case, it is easier to discern the matrix and embedded reading of the second adjunct. Other asymmetries surely exist, but, as I have no explanation for these facts at present and since the relevant point in regard to (75) has been made, I will leave the topic to further research.

3.3 The Anti-C-Command Constraint

3.3.1 "Reconstruction" and C-Command

One of the characteristic properties of parasitic gap constructions is the requirement that the "licensing" gap must

not c-command the parasitic gap.[39] Sentences such as those in (85) are taken as evidence for this anti-c-command constraint.

85) a. the article that I read t before filing e
b. the movie that everyone who sees e enjoys t
c. * the book that t fell out the window before you could catch e[40]

Sentences of the following sort (noticed by Barss & Engdahl) indicate that the anti-c-command constraint is not derivable from some property of subject gaps.

86) a. which papers did John decide to tell his secretary t were unavailable before reading e
b. which papers did John decide, before reading e, to tell his secretary t were unavailable
c. * which papers t were unavailable before you discovered e

In (86a) the position of the adjunct is ambiguous and the status of the sentence is unclear. However, when the subject gap clearly fails to c-command the parasitic gap, as in (86b), the sentence is grammatical.

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39. This was first discussed in Taraldsen (1979); further development and discussion of this property appears in Engdahl (1983), Chomsky (1982, 1986) and in much other work.

40. It is necessary to use a tensed adjunct clause to demonstrate the anti-c-command effect since the subjects of these adjunct clauses are controlled by the nearest subject when they are PRO. This then creates a condition C violation in the adjunct clause, as illustrated below.

i) * the article$_i$ that t$_i$ fell out the window before PRO$_i$ reading e$_i$

While a tensed clause generally degrades the acceptability of parasitic gap constructions, the contrast between (ii) and (85c) is still strong.

ii) the book that I dropped t before you could catch e

In CC the anti-c-command constraint follows from Binding Condition C: in a structure such as that in (87), the e_i is c-commanded by a coindexed argument, t_i.

87) $[_{CP}$ which papers$_i$ $[_{IP}$ t_i were ... $[_{PP}$ before you discovered e_i]]]

Under the CC analysis there are no intermediate traces between t_i and e_i in (87) and, therefore, it will also be ruled out because e_i is locally A-bound and so does not meet the contextual definition of a variable.

Contreras (1984, 1987) argues that c-command[41] does hold between the object and adjunct phrase in parasitic gaps on the basis of the ungrammaticality of sentences like (88).

88) * John filed them$_i$ without reading Mary's articles$_i$

He argues further that (88) cannot be ruled out by some constraint on backwards pronominalization because such sentences improve when c-command does not hold.

89) a. John filed their$_i$ articles without meeting those students$_i$
b. John filed the articles about them$_i$ without meeting those students$_i$

He proposes that a null operator intervenes between the parasitic gap and "real" gap in both (85a) and (85c), eliminating the relevance of c-command in ruling out (85c).

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41. The definition of c-command relevant for Contreras must be equivalent to what I term "m-command". This will also be the case for the proposal made by Barss, Johnson and Saito, which is discussed in text below.

The O-subjacency approach proposed in Barriers to account for anti-c-command effects has been summarized above.

Returning to the idea that c-command must not hold between the real gap and parasitic gap, there are several ways to account for Contreras' observation. One approach (suggested by Barss, Johnson & Saito, p.c.) involves base-generating the adjunct under VP and allowing extraposition in the case of parasitic gap formation.[42] This type of derivation is illustrated in simplified form in (90).

90) a. ... $[_{VP}$ V α $[_{PP}$ ... ß ...]] ...
b. ... $[_{VP}$ $[_{VP}$ V α] $[_{PP}$ ... ß ...]] ...

In the derived structure (90b) c-command does not hold between α and ß and the anti-c-command constraint is not violated.

In Browning (1986) I discussed a similar proposal which was finally rejected for reasons which I will now discuss. First, consider the sentence in (91), in which it seems reasonable to assume that the CP complement is base-generated in a position m-commanded by the NP complement.

91) Who$_i$ did you warn t_i [Op$_i$ that the police would arrest e_i]

As in the case of (85a) above, we might argue that the category containing the parasitic gap, the CP complement in this case, is in an extraposed position at SS. The relative

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42. Another approach is to say that extraposition occurs in every case, but interpretation under "reconstruction" is obligatory for names and not for parasitic gaps.

unacceptability of (92), in which the complementizer is null may be evidence that the CP is in an ungoverned position.

92) Who did you warn t [the police would arrest e]

Speakers generally find (92) somewhat worse than (91). This is consistent with the proposal (Stowell 1981; Kayne 1981) that null complementizers appear only in properly governed positions.

A possible problem for this approach is raised by sentences such as (93) in which an adjunct containing a parasitic gap is preposed outside of the SS c-domain of the overt wh-operator.[43] These sentences are acceptable in Italian with only a slight degree of marginality.

93) ? Senza conoscere e prima bene, non so proprio quale altra ragazza Gianni sarebbe disposto a sposare t

'Without PRO$_i$ knowing e$_j$ well beforehand, I really don't know which girl$_j$ Gianni$_i$ would be ready to marry t$_j$.'

The adjunct in (93) is interpreted as if in its base-generated position, as shown by control of the adjunct subject. An adjunct which originates in a higher clause cannot contain a parasitic gap. Consider, for example, the sentences in (94) which are analogous to (93) except that the adjunct is

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43. These sentences are from Longobardi (1985) where the interesting properties of topicalization in Italian were first brought to my attention; as Longobardi argues for a connectedness analysis of these sentences, he does not discuss the ramifications which they have for the anti-c-command constraint.

associated with the matrix clause, as indicated by matrix subject control of the adjunct subject.

94) a. * Senza PRO$_i$ conoscere e$_j$ prima bene, (io$_i$) non so proprio quale altra ragazza$_j$ Gianni sarebbe disposto a sposare t$_j$

'Without PRO$_i$ knowing e$_j$ well beforehand, I$_i$ really don't know which girl$_j$ Gianni would be ready to marry t$_j$.'

b. * Prima di PRO$_i$ aver letto e$_j$ attentamente, (io$_i$) non riesco proprio a immaginare quale libro$_j$ Maria accetterebbe di pubblicare e$_j$ nella sua collana.

'Before PRO$_i$ reading e$_j$ carefully, I$_i$ really can't imagine which book$_j$ Maria would accept to publish t$_j$ in her series.'

c. * Pur senza PRO$_i$ aver letto e$_j$ attentamente, (io$_i$) non credo che questo libro$_j$ Maria accetterebbe di pubblicare e$_j$ nella sua collana.

'Though PRO$_i$ not having read e$_j$ carefully, I$_i$ do not believe that, this book$_j$, Maria would accept to publish t$_j$ in her series.

The contrast between (93) and (94) indicates that these parasitic gap constructions are judged to well-formed or ill-formed on the basis of the pre-topicalized position of the adjunct containing the parasitic gap. Even "under reconstruction" the parasitic gaps in (94) will not lie within the scope of the licensing operator.

The evidence presented thus far indicates only that parasitic gap constructions <u>may</u> be judged for well-formedness on the basis of the pre-movement position of the adjunct. Where it is necessary to meet scope requirements, as in (93), "reconstruction" applies. It could be argued that, where it would result in a Binding Condition C violation, as it might

in (85a), "reconstruction" does not apply. If a sentence such as (85c) could not be saved by topicalizing the adjunct, then we would have evidence that an adjunct is obligatorily "reconstructed" to its DS position and that the anti-c-command constraint holds. The necessary sentence is difficult to construct for several reasons. In English, the effects of the Subjacency Condition, the relative awkwardness of topicalization (compared with Italian) and the additional unacceptability triggered by the tensed adjunct clause obscure the relevant contrast between the (a) and (b) sentences below.

95) a. Which candidate$_i$ did you say that, while you interviewed e_i, John thought t_i would be evaluated
b. Which candidate$_i$ did you say that, while you interviewed e_i, John thought we could evaluate t_i

96) a. Before you met e_i, I can't remember which author$_i$ t_i was interviewed
b. Before you met e_i, I can't remember which author$_i$ I interviewed t_i

If adjunct movement cannot save an ill-formed structure, then (95a) and (96a) should be significantly worse than (95b) and (96b). This contrast seems rather clear in (95) but both sentences in (96) are, for me, strongly ungrammatical. The relevant contrast is more clear in the Italian version of (96).[44]

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44. A note on notation: Longobardi gives parasitic gap constructions with adjuncts <u>in situ</u> and those with topicalized adjuncts the same rating: ?. My informants judged the topicalized structures to be marginally more deviant, e.g. ??, than the non-topicalized versions. Even given the increased deviance of all topicalized constructions, a sharp contrast between (97a) and (97b) was reported.

97) a. * Prima che hai conosciuto e_i, non ricordo quale autore t_i era stato intervistato
b. ? Prima che hai conosciuto e_i, non ricordo quale autore$_i$ ha intervistato t_i

As indicated, extraction from subject does not license a parasitic gap even when the adjunct is topicalized outside of the c-domain of the subject.[45]

It should be noted that the movement allegedly responsible for voiding a potential anti-c-command constraint violation in (85a) is rightward movement, a form of extraposition, while the movement which has been central to my counterargument above is leftward movement, topicalization. It has often been pointed out that these two types of movement differ in some respects, e.g. bounding constraints, which might indicate that we are dealing with two significantly different operations. Nevertheless, I have proceeded under the assumption that the two types of movement behave identically with respect to "reconstruction". The complex chain analysis allows a return to the binding theoretic account of anti-c-command effects proposed in CC and is consistent with the obligatory "reconstruction" of adjuncts, i.e. with interpreting them as if in their base-generated positions.

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45. The example is equally bad with a non-derived subject, as illustrated by (i).

i) * Prima che hai conosciuto e_i, non ricordo quale scienziato$_i$ t_i ha vinto il premio Nobel

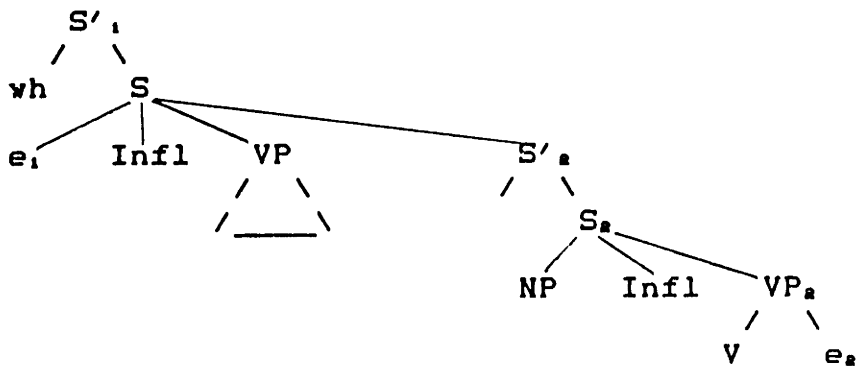
3.3.2 Some Consequences for the Connectedness Condition

It is well-known that A′-movement from a c-commanding subject position or from a position which is "too high" in the tree does not license parasitic gaps. Within the "Connectedness" framework these are sub-cases of the same general constraint on well-formed structures: ungrammaticality results whenever the g-projection set of a gap fails to include the node immediately dominating its antecedent. Sentences such as those in (98a) and (98b) are then ruled out for the same reason: the g-projection set of the parasitic gap fails to form a unified subtree with the g-projection set of the real gap, as shown schematically in (98c) and (98d).

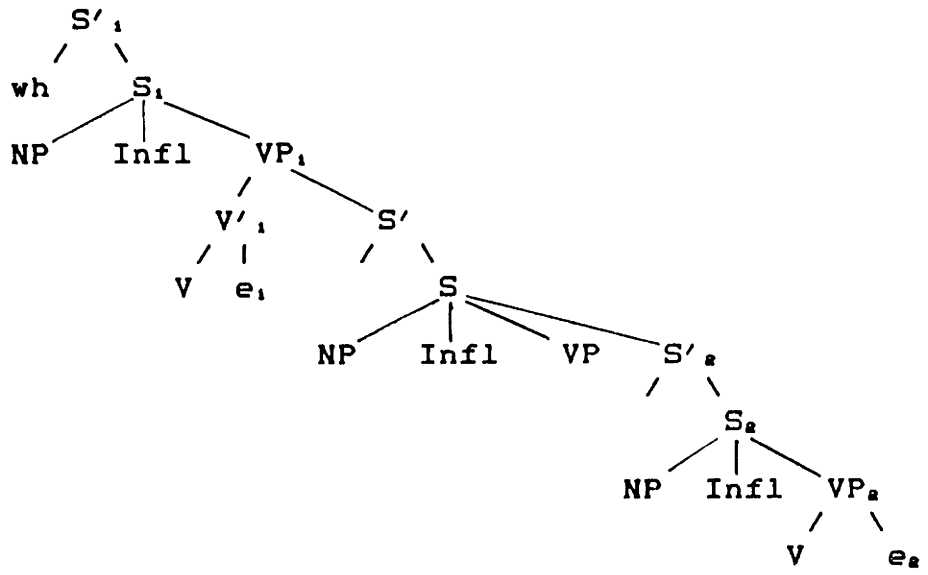
98) a. * which paper t fell off the table before John could catch t

b. * who$_i$ did you warn t$_i$ [that John$_j$ had telephoned the police [before PRO$_j$ meeting with e$_i$]]

c.



d.



It is necessary for the analysis of sentences such as (97b) that the g-projection set of a gap does not end with the node immediately dominating its antecedent, but rather, continues up the tree until one of the conditions for g-projection formation fails to be met. This predicts that extraction configurations such as those in (98a) and (98b) should license a parasitic gap when the adjunct clause is topicalized. In the sentences of (99) the "real" gap is in a higher clause than the adjunct containing the parasitic gap and they are predictably ungrammatical.

99) a. * Non potevo ricordarmi chi$_i$ ti ha detto che Maria ha rapinato la banca, dopo che ha lasciato e$_i$
'I couldn't remember who$_i$ t$_i$ told you that Maria had robbed a bank after she left e$_i$'

b. * Non potevo ricordarmi chi$_i$ hai detto che Maria$_j$ ha rapinato la banca, dopo che ha lasciato e$_i$
'I couldn't remember who$_i$ you told t$_i$ that Maria robbed a bank after she left e$_i$'

As shown in (100), when pronouns are substituted for the parasitic gaps, the sentences are good both with and without preposed adjuncts.

100) a. Non potevo ricordarmi chi$_i$ ti ha detto che Maria ha rapinato la banca, dopo che lo$_i$ ha lasciato
'I couldn't remember who$_i$ t$_i$ told you that Maria had robbed a bank after she left him$_i$'

b. Non potevo ricordarmi chi$_i$ hai detto che Maria$_j$ ha rapinato la banca, dopo che lo$_i$ ha lasciato
'I couldn't remember who$_i$ you told t$_i$ that Maria robbed a bank after she left him$_i$.'

c. Dopo che lo$_i$ ha lasciato, non potevo ricordarmi chi$_i$ ti ha detto che Maria ha rapinato la banca
'After she left him$_i$, I couldn't remember who$_i$ t$_i$ told you that Maria robbed a bank.'

d. Dopo che lo$_i$ ha lasciato, non potevo ricordarmi chi$_i$ hai detto che Maria$_j$ ha rapinato la banca.
'After she left him$_i$, I couldn't remember who$_i$ you told t$_i$ that Maria robbed a bank.'

Longobardi's analysis predicts that preposing the adjuncts in (99) will improve the sentences, but this is not the case, as shown by the ungrammaticality of (101).

101) a. * Dopo che ha lasciato e$_i$, non potevo ricordarmi chi$_i$ ti ha detto che Maria ha rapinato la banca
'After she left e$_i$, I couldn't remember who$_i$ t$_i$ told you that Maria had robbed a bank'

b. * Dopo che ha lasciato e$_i$, non potevo ricordarmi chi$_i$ hai detto che Maria$_j$ ha rapinato la banca.
'After she left e$_i$, I couldn't remember who$_i$ you told t$_i$ that Maria robbed a bank.'

The extra embedding in (99) and (101), which is necessary in order to bypass the effects of matrix subject control of the adjunct subject, make the judgements here difficult. Nevertheless, the contrast between (99)/(101) and sentences such as

(97b) is quite sharp for native speakers. While the augmented connectedness approach of Longobardi (1985) cannot account for this contrast, it is predicted by the complex chain analysis which takes anti-c-command effects to be Binding Condition C violations.

3.4 Notes Towards a Theory of Empty Categories

In §2.3.6 I mentioned briefly the alternative theories of empty categories proposed by Brody (1985) and Barss (1986). Both theories account for the distribution of ECs by means other than assigning the [±anaphor, ±pronominal] feature matrices which produce the familiar four-part typology that has been the basis for the proposals made herein. Brody and Barss both offer cogent critiques of the traditional GB approach to ECs and their proposals are interesting and provocative. This section begins with a brief reflection on these two theories and ends with a sketch of hybrid theory of ECs which resembles more closely the traditional GB approach, but which incorporates some of the insights from Brody (1985) and Barss (1986). The suggestions made in the latter part of this section are no more than possible directions for research which I take up in more detail in work in progress.

Brody (1985) points out that the distribution of trace (governed ECs) and PRO (ungoverned ECs) in the LGB version of GB theory "follows from the accidental interaction of two unrelated modules of grammar," namely, the ECP and Binding Theory. He argues that such an important aspect of the distri-

bution of ECs should not result from such a conspiracy, but should be encoded directly in deep principles of the grammar. He proposes that the government distinction should be accounted for by an appropriate reformulation of Case Theory, with other aspects of EC distribution falling under the Binding Theory. He first formulates the distinction between governed and ungoverned ECs as the One Fell Swoop EC Condition in (102)

102) OFS EC Condition: An EC is the head of a chain iff it is ungoverned.

and later as part of his Case-checking Theory.[46] The Binding Theory is revised along the lines of Manzini (1983) under the assumption that all ECs are anaphors.

Since there are no null pronominals and since (102) prohibits the existence of a governed null head of a chain, Brody must regard the null subject of tensed sentences in null subject languages as a non-head member of a chain headed by AGR on a par with the EC associated with clitics. Both ECs, like

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46. Brody's theory involves the following assumptions, among others: ECs do not bear case; lexical NPs and what are called "case assigners" in a case assigning theory bear case inherently; "chain" refers to maximal chains only. The following Conditions must be met:

i) Case-linking Condition

a. * NP unless Case-linked.
b. NP_x is Case-linked iff NP_x is the head of a chain.

ii) Case-matching Condition

If NP_x is Case-linked to y, then y has a Case that matches that of NP_x.

all others, are pure anaphors. (102) encodes another crucial difference between Brody's theory and the GB approach to ECs: in the latter the trace left by wh-movement from an A-position, e.g. t_i in (103),

103) What$_i$ did you buy t_i

heads an A-chain and is a non-head member of an A′-chain. In Brody's theory, t_i in (103) is governed and, therefore, may not head a chain. It is only a non-head member of an A′-chain.

It seems to me that this latter position misses an important fact about the types of chains that exist and the conditions which apply to them. Chains may be divided into three categories depending on the types of elements which they contain: A′-chains, A-chains and A/A′-chains (which I will call "operator-variable chains".[47] These three types are illustrated in (104a,b,c) respectively.

104) a. How do you [t^4 [think [t^3 that John [t^2 [made so much money t^1]]]]]

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47. I will leave out of the discussion clitic chains and the chains formed between post-verbal subjects and the preverbal ECs with which they are associated. The latter seem to involve, like <u>there</u>-insertion structures, a type of A-chain. The former has sometimes been analyzed as an A/A′-chain. If the speculation §2.3.6 is correct, then clitic constructions involve a one-member A-chain (pro) identified by the clitic, which acts as a kind of agreement marker. This hypothesis requires some additional assumptions to differentiate between the agreement markers in languages like Hindi and Navajo and clitics such as those in Romance languages.

Note that the use of "operator" here contradicts the usage settled on in chapter two. This usage is adopted for ease of reference and is not meant to invalidate the points made in the earlier discussion.

b. John seems [t^2 to have been insulted t^1]
c. What do you [t^4 [think [t^3 that John [t^2 [bought t^1]]]]]

I will not embark on an in depth discussion of the locality conditions which apply to these structures; chapter four contains extensive discussion of the differences between arguments and non-arguments, complements and non-complements with respect to the ECP and the Subjacency Condition and empirically motivated revisions of both. At this time I simply wish to point out a fact which, I believe, should be taken into account in formulating a theory of empty categories and chains: chains which involve only one type of element (i.e. "internally consistent" chains) are subject to stricter locality constraints than are operator-variable chains.

In earlier versions of the GB framework, the locality conditions which constrain (104a) and (104b) are distinct. Thus, (105a) is ruled out by the ECP and (105b) by Binding Condition A.

105) a. * How did you wonder whether John made so much money t
b. * John seems that Bill admires t

Steps towards unifying the account of (105a) and (105b) are taken in Barriers and KoL where (105b) is ruled out by a combination of the ECP and Binding Condition C. Under the assumption that the ECP reduces to antecedent government, if the NP John moves from its base-generated position, t, to its SS position the empty category, t, will not be properly governed.

(The Subjacency Condition will also be violated.) If John reaches its SS position by successive cyclic movement, as in (106), then t will be antecedent governed by t^1.

106) John [t^3 [seems [t^2 that Bill [t^1 admires t]]]]

However, because t is A′-bound at SS it can only be a variable, an element subject to Binding Condition C in the revised version given below. ((107) = (87), ch. 3, KoL)

107) An r-expression is A-free in the domain of the head of its maximal chain.

The maximal chain to which t belongs includes John, a coindexed NP in an A-position; therefore, (106) is ruled out as a Binding Condition C violation. Notice that this ECP + Binding Condition C approach (which I will call the "improper movement analysis") is a way of expressing the constraint against A′-to-A movement; see (iic) of fn. 2 in chapter one for the formulation of this constraint given in Chomsky (1973). But notice that the improper movement analysis should only apply to chains involving ECs which are subject to the binding theory and, presumably, only null NPs are subject to the binding theory. Nevertheless, (108a) is just as bad as (108b). The same question arises for adjuncts, as in (108c).

108) a. * Under the bed seems that it is considered t a good place to hide
b. * John seems that it is considered t to be intelligent.
c. * Quickly/on Tuesday/in the garage seems that John fixed the car.

If (108a) and (108c) are given the structure in (109), then the ECP will be satisfied.[48]

109) $[_{CP}\ [_{IP}\ XP_i\ [_{VP}\ t_i^4\ [_{VP}$ seems $[_{CP}\ t_i^3$ that $[_{IP}$ John $[\ t_i^2\ [$ fixed the car $t_i^1\ ]]]]]]$

Two options exist at this point: either t_i^1 in (108a) and (108c) must be subject to the binding theory or there must be an independent means of ruling out A′-to-A movement.

The approach I will propose involves taking the latter option and restating the problem so that it is not "how can we rule out A-to-A′ movement?", but rather, "how can we constrain the elements which can be co-members of a single chain so that we have only the three chain-types in (104)?" The first proposal is that the theory must contain a constraint which requires non-operator-variable chains to be internally consistent, e.g. (110).

110) a. If $C = (\alpha_1, \ldots, \alpha_n)$ is an X, then $\forall \alpha_i \in C$, α_i is in an X-position.
b. X = {argument, non-argument}

Operator-variable chains are made up of two internally consistent sub-chains. The set X in (110b) could be expanded to

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48. In the case of adjunct movement, the Minimality Condition of Barriers will rule out the structure in (109). However, this is not a desirable result, since the condition will also rule out the grammatical sentence in (i) for the same reason.

i) How do you want John to fix the car?

See chapter four for discussion of this and other aspects of the Barriers Minimality Condition, as well as a revised Minimality Condition which does not rule out (109).

include "head" since head-to-head movement shows the same tight locality constraints as A-movement and adjunct movement.

The analysis of raising and passives in Barriers presents a problem for this proposal since in these cases it requires a non-NP head (e.g. I, A, or V) to facilitate antecedent government of the NP-trace. If the antecedent governors in such cases are considered to be part of the chain, then the chain is not internally consistent. However, the mechanisms required for the Barriers analysis are somewhat suspect, given the sharp ungrammaticality of (111a).

111) a. Be_i $John_i$ $will_i$ t_i $invited_i$ t_i to the party?*[49]

b. $John_i$ $will_i$ be_i $invited_i$ t to the party

---

49. R. Kayne (p.c.) first brought to my attention the fact that violations of the Head Movement Constraint (Travis (1984)) are more ungrammatical than other ECP violations. Compare (i) and (ii).

i) Who do you wonder why t left?
ii) Buy John will t a newspaper?

In (i) the EC is in violation of the ECP; as a result the lower verb is without one of its arguments and the matrix wh-operator does not bind a licensed variable. Because the EC in (ii) is unlicensed we cannot regard (buy,t) as a discontinuous entity. There is no verb in a position from which it could θ-mark and case-mark its arguments: t is not part of a verb and buy is not in a position from which it could θ-mark or case-mark its arguments. If we regard a sentence as being made up of a core (the predicate head) and satellites (the arguments and sentential modifiers), we would expect (i) to be a less serious violation than (ii): in (i) only a satellite is not licensed (i.e. missing), while in (ii) the core is not licensed.

In order for (111b) to be grammatical the subject must be coindexed with the modals and the passive participle. The first link in this "extended chain" is the agreement between subject and INFL. Head-head coindexing passes the index down to the passive participle which antecedent governs the NP-trace. Presumably the same indexing is possible in (111a). We would therefore expect will to be able to properly govern the trace of be. (Movement of be to C is taken to be an instance of head-to-head movement, which, according to Baker (1985), is governed by the ECP. These problems do not arise if we adopt the relativized minimality condition in §4.6 and if VP is not a barrier by failure of L-marking. I will not attempt to decide whether the latter condition is tenable at this time.

Consider now the case of the internally consistent chains created by wh-movement of an adjunct. I mention at several different points throughout this dissertation two different means of accounting for the stricter ECP requirement which seems to apply to adjunct chains. Lasnik & Saito (1984; L&S) characterize this requirement in terms of the trace of origin of the adjunct: since this trace must be present at LF it must be marked [+τ] by the time the ECP filter applies at the end of the LF mapping. L&S propose that Affect α is ordered before τ-marking; therefore, the trace of origin of a moved adjunct will only be τ-marked if it is a member of a chain such that every non-head member of the chain is properly governed.

Chomsky (1986, class lectures) dispenses with the ordering of Affect α and τ-marking in favor of an explicit statement to the effect that adjunct chains must be fully represented throughout the derivation. It is necessary to adopt this stipulation if the ordering approach is abandoned since extraction of adjuncts over wh-islands would otherwise be identical to the extraction of arguments, i.e. it would be expected to yield a Subjacency Condition-type violation rather than an ECP-type violation. This approach is more compatible with the line of thinking in this section since it places a constraint on the chain as a whole, rather then on one element of the chain. With the L&S approach the presence of the entire chain at LF is an epiphenomenon of the licensing of the trace of origin.[50] Therefore, to the constraint in (110) I add Chomsky's complete representation requirement (CRR).

Leaving (110) and the CRR aside for the moment, let's consider some of the points made in Barss (1986). Barss points out that sentences such as (112) are problematic for any theory of ECs which treats variables as being subject to Binding Condition C.[51]

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50. For further discussion of the licensing of adjunct chains, see §4.3.

51. Barss also gives examples involving cleft sentences such as those below.

i) It's him$_i$ that John$_i$ thinks that Mary loves t$_i$
ii) * It's him$_i$ that John$_i$ admires t$_i$
iii) It's himself$_i$ that John$_i$ admires t$_i$
iv) * It's himself$_i$ that John$_i$ thinks that Mary loves t$_i$

These illustrate the same point as the data in (112) and (113)

112) Himself$_i$, John$_i$ likes t$_i$

113) a. * John$_i$, he$_i$ admires t$_i$
b. * Him$_i$, John$_i$ admires t$_i$
c. * Himself$_i$, John$_i$ thinks that Mary admires t$_i$

The variable t$_i$ is A-bound by John, which is in the domain of the head of the variable's maximal chain, himself. While the data in (113) are consistent with the hypothesis that variables are R-expressions subject to Binding Condition C, they are also consistent with the hypothesis that variables take on the properties of their A′-antecedents with respect to the binding theory. The data in (112) and (113) taken together support the latter hypothesis over the "variable = R-expression" hypothesis. Barss proposes that these facts can be dealt with if ECs take on the binding features of the heads of their A′-chains. This he calls the "Feature Match Hypothesis" (FMH).

Although, the FMH works well for operator-variable chains, it runs into serious problems with A-chains. Consider the examples in (114).

114) a. John was arrested t
[-a,-p] [-a,-p]

b. He was arrested t
[-a,+p] [-a,+p]

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if the focussed element is taken to be the head of the chain containing the variable. This is inconsistent with the approach to A′-chains adopted in this dissertation; additional research is necessary to determine whether the aspects of Barss's analysis of these phenomena which I wish to adopt are ultimately compatible with the other proposals herein.

c. John wanted PRO to be arrested t
[+a, +p] [+a, +p]

In (114a) the EC is an R-expression and Binding Condition C predicts that the sentence should be ungrammatical. In (114b) the EC is a pronominal and the sentence should be ruled out by Binding Condition B. Finally, in (114c) the EC takes on the features of PRO and should, therefore, be ungoverned. In (114a,b) the problem stems from the structural relation between the EC and the head of the A-chain. Barss proposes that this be overcome by limiting the binding theory to regulating the relations between elements which are not members of the same chain, that is, the binding theory is a set of constraints governing relations between chains, not relations within chains. This will not take care of (114c), however, since the problem there is not between the EC and the head of its A-chain, PRO. The problem is that the EC is governed by the passive participle when, as an pronominal anaphor, it must be ungoverned.

These problems lead Barss to reject the FMH in favor of the "No Features Hypothesis" (NFH), which dispenses with the features [±anaphor, ±pronominal] altogether. The distribution of ECs is determined by Brody's (1985) case-matching theory (see fn. 22 above), Rizzi's (1982) Local Binding Condition, and a reformulation of the Binding Theory on the basis of Higginbotham's (1983) linking theory of binding relations. I will not review the specifics of this approach or the interesting arguments which Barss marshalls in favor of it, since I

am most interested in the simple insights behind the FMH and the NFH. Barss considers the possibility of retaining the FMH for A′-chains and adopting the NFH for A-chains, but rejects the distinction between chain-types that this solution implies as an unmotivated complication of the theory. The point of this section is that there is motivation for distinguishing between chain-types, but the relevant schism is not between A-chains and A′-chains but between internally consistent chains and operator-variable chains. Therefore, to the constraint in (110) and the CRR I will add the following: (i) the NFH holds for internally consistent chains and (ii) the FMH holds for operator-variable chains.

By (ii), I mean that traces left by movement have no features other than those they receive by virtue of being in a chain with their heads. Thus, the condition on variables in §4.2.1 is an identification condition in the strongest sense.

(i) entails the position that the argument in a sentence such as (104b) is not (John), but is rather the discontinuous entity (John, t^2, t^1). Similarly, the adjunct in (104a) is not (How) but the discontinuous entity (How, t^4, t^3, t^2, t^1). The primary task in developing this approach will be to determine whether the current definitions of "barrier", "antecedent government" and all the related concepts yields the desired results and, if they do not, to redefine them. (i) is a way of saying that the non-head elements of internally consistent chains are not relevant, or visible as individual entities, for a certain set of constraints, e.g. the binding theory.

Alternatively, we might say that the non-head members of internally consistent chains do bear features, but that they are inaccessible to certain constraints.

The problem with passivized PRO which led Barss to reject the FMH does not arise with this approach since the trace of NP-movement of PRO in (115)

115) John wanted PRO to be arrested t

is not itself PRO, i.e. it is not constrained to appear only in ungoverned positions. If we assume that the distribution of PRO is given by the binding theory, the binding theory must apply only to whole entities and not their subparts; since the head of the PRO chain in (115) is ungoverned, the binding theory is satisfied. If we incorporate the requirement that PRO be ungoverned directly into the grammar, then this constraint needs to be formulated in a similar manner.

The ECP as it applies to variables in operator-variable chains and the CRR + ECP constraint on internally consistent chains might derive from the same principle:

116) Feature-sharing requires government.

In the case of operator-variable chains we could say that the type of feature-sharing which takes place is feature assignment, a one-time transmission of features from the operator to the EC. This feature transmission would require that the operator govern the variable only at one point in the derivation, a state which obtains in grammatical structures after the

first "move" of the operator. In the case of internally consistent chains feature-sharing is not really a one-time transmission of features, since we are regarding the entire chain as the relevant entity for purposes of interpretation, etc. Therefore, for every link (α_i, α_{i+1}) of such a chain, α_i must govern α_{i+1} so that all the elements of the discontinuous entity share the features of the entity. Note that the identification of pro, another sort of feature sharing, also takes place under government, even when facilitated by the agreement chain of chapter two.

If variables receive their features from their A′-antecedents and if lexical NPs are characterized in terms of [±anaphor, ±pronominal] features, then movement-derived ECs will still be characterized in terms of the familiar feature matrices. Is it necesary to retain the four-part feature-based typology for base-generated ECs? Once again I have only some speculative remarks to make on this point which indicate a direction for research. Brody's arguments against the traditional means of deriving the PRO Theorem from the Binding Theory are compelling. However, his method of accounting for the distribution of governed and ungoverned ECs, which does not recognize the existence of pro, is incompatible with the analysis of null operators I have proposed. An alternative approach, suggested by Chomsky (1986, class lectures), is to regard Control theory as a licensing mechanism for ungoverned ECs analogous to the other means of identifying ECs which have been discussed. We could then regard both PRO and pro as pure

pronominals; PRO being the ungoverned instance which is identified as specified by Control theory, pro being the governed instance which is identified by agreement.[52]

To summarize briefly the speculative proposals made in this section: only pure pronominal ECs are base-generated; ungoverned pronominal ECs are identified by Control theory; governed pronominals are identified by agreement. Chains which are not operator-variable chains are required to be internally consistent (110) and represented throughout the derivation (CRR). Internally consistent chains are regarded as discontinuous entities and the ECs which are their sub-parts do not bear binding features, (i). Variables are identified by their operators and are assigned the binding features of those operators, (ii). (Variables are discontinuous entities of the A-chain type.) The locality constraint governing discontinuous entities is stronger than that governing the operator-variable relationship; both are given in terms of the ECP and may derive from principle (116). In work in progress I attempt to develop these notions into an articulate theory of empty categories.

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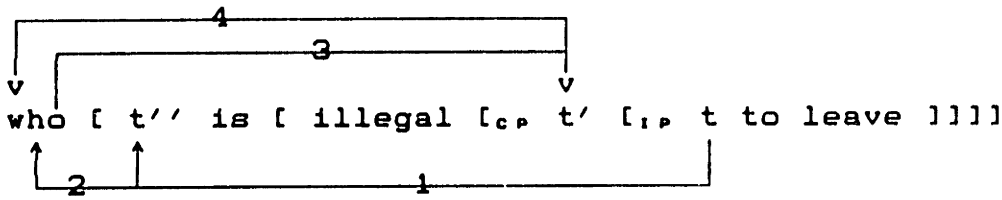
A note on the improper movement analysis of (105b): Barss (1986) discusses a derivation of the sentence in (117a) which he argues is problematic for Chomsky's "improper

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52. Borer (1986a, 1986b) also proposes that all instances of PRO are actually pro.

movement" analysis summarized above; the example and derivation are credited to Epstein (in progress).

117) a. who is illegal to leave



The derivation illustrated in (117b) allows t to be an anaphor (since it is the result of movement to an A-position) and to be properly governed (by t'). However, this derivation is one of a class of derivations discussed in Epstein (in progress) which involve what I will call "vacuous lowering." Notice that who leaves the matrix SPEC of CP position in move (3) and goes to the lower SPEC. It then returns to the matrix SPEC on move (4), leaving behind the trace t'. If chains are histories of movement (and if we take who in (118) to mark the position of the matrix SPEC), then the chain associated with the derivation in (117b) is that in (118).

118) (who, t', who, t'', t)

The chain in (118) does not exist as such at SS. Therefore, either chains are not histories of movement or the chain in (118) and the sequence of entities in (119)

119) (who, t'', t', t)

bear no formal relation to one another.

The approach to chains and the Subjacency Condition which I adopt in this chapter is not consistent with an approach which regards (118), rather than (119), as the relevant chain in (117b). However, the chain formation approach to parasitic gap constructions I adopt is also inconsistent with the idea that chains are histories of movement. The inconsistency is easily rectified in a manner which rules out all derivations involving vacuous lowering if we regard SS chains as reflections of the operations involved in their derivation from DS. Every link of a chain at SS is the output of an operation and no operations can be involved in the derivation of a chain which are not reflected in the SS representation of that chain. Thus, the Subjacency Condition indirectly retains its character as a condition on operations.

CHAPTER FOUR

CONDITIONS ON A′-CHAINS

4.1 Introduction

The ease with which an element, α, undergoes Move α depends largely on the nature of the relation, if any, which holds between α and a head. For example, it is generally true that internal arguments of a verb move more freely than does the external argument or an adjunct.[1] The constraints governing the possibilities for movement have been variously formalized with the Subjacency Condition and the ECP playing the crucial role in recent years.[2] Controversial data from parasitic gap constructions and some OWM constructions suggest that in some cases the distribution of subject and adjunct gaps[3] is more tightly constrained than is predicted by the interaction of Move α and the ECP. Taraldsen (1979) and Chomsky (1982), focussing on parasitic gaps, argue from this that these gaps are not derived by movement; the ECP is preserved as is. Stowell (1985) and Cinque (1986) partially motivate constraints designed to take the place of the ECP on the basis of

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1. But see Torrego (1984) and Koopman & Sportiche (1986) for counterexamples to this descriptive statement; see also §4.4.5 for discussion of some of the data in Koopman & Sportiche.

2. See chapter one for definitions.

3. Since I will be focussing on A′-movement and the traces left by A′-movement, the term "gap" will be taken as synonymous with "variable".

this unexpected distribution of subject and object gaps. In this cpater I will show that the phenomena in question are not unified and that they do not require a reformulation of the ECP. §4.2 reviews the traditional ECP asymmetries and presents the unexpected asymmetries in question. §4.3 and §4.4 deal with the problematic adjunct gaps and subject gaps, respectively. §4.5 and §4.6 discuss aspects of the Barriers system relevant to the Subjacency Condition and the ECP.

4.2 Null Operators and the ECP

4.2.1 ECP Asymmetries

Inherent in most current versions of the ECP is a fundamental dichotomy between arguments and adjuncts. In Lasnik & Saito (1984; hereafter L&S) this is expressed in the restriction that τ-marking for adjunct traces occurs only at LF, while τ-marking for argument traces may occur at either SS or LF.[4] Part of the justification for this argument vs. adjunct distinction comes from the severity of the violation incurred by adjunct extraction from an island, as compared with the

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4. See chapter one, fn. 10 & fn. 11 for definitions. L&S allow τ-marking of argument traces at either SS or LF under certain conditions. In particular, they argue that (i) a trace must be τ-marked at the level at which it is created, (ii) the τ-marking assigned to a trace may not be changed during the course of a derivation and (iii) τ-marking is strictly ordered after Affect α at each level. Chomsky (class lectures, fall 1986) departs from these positions by assuming that (i) a trace may remain unmarked at its level of creation and (ii) τ-marking of arguments is unordered with respect to Affect α. See §3.1 and §4.3 for further discussion.

relatively milder violation incurred by extraction of an argument. This contrast is illustrated in (1).

1) a. * how did Jane wonder whether to expect to fix the car
   b. ?? which car did Mary wonder whether to expect Jane to fix t
   c. ?? who did Jane wonder whether to expect t to show up

Earlier versions of the ECP (e.g. that of LGB) focussed on a somewhat different sort of asymmetry, namely, the behavior of subjects as contrasted with the behavior of objects. Huang (1982) later argued that adjuncts pattern with subjects in extraction possibilities, that is, the dichotomy is correctly stated as subject/adjunct vs. object. This asymmetry is illustrated by the paradigm in (2).

2) a. * who$_i$ did you wonder how$_j$ t$_i$ fixed the car t$_j$
   b. * how$_j$ did you wonder who$_i$ t$_i$ fixed the car t$_j$
   c. ?? what$_i$ did you wonder how$_j$ Mary fixed t$_i$ t$_j$

There is no real contradiction in these two apparently divergent groupings (subject/object vs. adjunct and subject/adjunct vs. object) when we look more closely at the formulation of the ECP and the underlying structures of (1) and (2). The point of interest here is why movement of a subject should result in an ECP violation in (2a) but not in (1c). Two possible SS representations for (1c) and (2a) are given (in simplified form) in (3a) and (3b), respectively.

3) a. who$_i$ Jane wondered [$_{CP}$ whether [$_{IP2}$ PRO to [$_{VP2}$ t$_i$' [$_{VP}$ expect [$_{IP1}$ t$_i$ to show up]]]

b. who$_i$ you [$_{VP}$ t_i' [$_{VP}$ wondered [$_{CP}$ how$_j$ [$_{IP}$ t_i fixed the car t_j]]]

It is obvious that the ECP violation incurred in (2a)/(3b) follows from the structure of the sentence rather than some inherent property of subjects. That is, the ECP is not violated in (3a) because t_i' is in a position which allows it to antecedent govern (τ-mark) the trace t_i. On the other hand, t_i' in (3b) cannot antecedent govern t_i because CP is a barrier for t_i by inheritance.[5]

This brief résumé of some of the ECP-related properties of subjects indicates that "long-distance" extraction of subjects does not incur an ECP violation so long as the structural context permits an antecedent governor to τ-mark the trace of origin. The structural contexts which allow τ-marking of the subject in English are three: ECM constructions, (4a), small clause complements, (4b), and embedded, complementizer-less finite clauses which are the complements of "bridge" verbs, (4c).[6]

4) a. who$_i$ do you believe t_i to be a fool
b. who$_i$ do you consider t_i a fool
c. who$_i$ do you think t_i left

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5. In theories which allow lexical government (i.e., government by a head) to satisfy the ECP, such as that in LGB and L&S, (3a) is a licensed structure because t is lexically governed by expect; t in (3b) is neither lexically nor antecedent governed.

6. There has been much discussion in the literature of the "bridge" properties of certain verbs; in particular, see Erteschik (1973), Stowell (1981) and Fukui (1987).

Having established the distribution of subject and adjunct gaps which the ECP predicts, let us now turn to the facts concerning the distribution of subject and adjunct gaps in parasitic gap and OWM constructions.

4.2.2 The Phenomenon

Traces of A′-movement will naturally be ruled out when they occur in the subject position of an infinitival clause by the requirement that chains must receive case.[7] For this reason, (5a) and (6a) must have PRO in subject position, as shown in (5b) and (6b), rather than a variable, as in (5c) and (6c).

5) a. a man to fix the sink
   b. a man [[PRO to fix the sink]]
   c. a man [Op [e to fix the sink]]

6) a. Jane is too angry to leave.
   b. Jane is too angry [[PRO to leave]]
   c. Jane is too angry [Op [e to leave]]

Leaving aside the case illustrated in (5) and (6), the ECP predicts that any construction should license variables in the contexts shown in (4). This prediction does not seem to be correct for parasitic gap and some OWM constructions. Consider the degree complements and tough constructions in (7) and (8), respectively.

7) a. * Mary is too sick for Jane to expect t to recover
   b. * Mary is too sick for Jane to think t left the hospital

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7. If traces must also be head-governed, they may also be ruled out by the inability of non-finite (or [-AGR]) INFL to act as a head governor.

8) a. * Mary was easy for Jane to expect t to recover
b. * Mary was difficult for Jane to think t would never leave the hospital

To my knowledge, the first discussion of this phenomenon appears in Ross (1967). In Chomsky (1973) the observation that an ECM subject differs from a true object in not permitting tough-construction formation (example (8a)) is credited to John Kimball. As is obvious from (8b), the effect is not restricted to ECM subjects. The same effect appears with purposives.

9) a. * I didn't hire Jane [Op_i for [you to consider t_i your secretary]]
b. * I didn't hire Jane [Op_i for [you to think [t_i is incompetent]]]

Infinitival relatives with variables in embedded subject position are also ungrammatical, as shown in (10).

10) a. * He is not [a man (for us) to expect t to succeed]
b. ?? They found [a man to believe t to be the Messiah]
c. ?? Jane finally found [an accountant to consider t a friend]

d. * He is [an employee for the boss to think t likes his work]
e. * Jane finally found [an accountant to believe t likes his work]
f. * They found [a man to believe t liked them]

I will disregard for now the somewhat weaker violation found in (10b,c) and continue with the presentation of basic data; this mitigation of the effect will be discussed in detail below.

Parasitic gaps are similarly limited in their ability to appear in subject position (11), nor are they licensed by adjunct wh-movement, (12).[8]

11) a. * the book that you bought t [without believing [e pleased Mary]]
b. * the person that you telephoned t [before e left the country]

12) a. * how did you fix the car t [after repairing the bicycle e]
b. * when did you leave Boston t [in order to visit Mary e]

It is also known that parasitic gaps are not licensed by wh-movement of a PP, a characteristic shared by the gaps in many OWM constructions; see §4.3.3 for discussion of this phenomenon.

Finally, there are three OWM constructions which do not appear with adjuncts: purpose clauses, tough-constructions and degree clauses.

13) a. * In the street is dangerous for Jane to fix the car t
b. * Quietly is difficult for Jane to speak t
c. * On Tuesday is difficult for Jane to come to a meeting t

14) a. * I ate lunch quickly$_i$ [Op$_i$ [PRO to leave t$_i$]]
b. * I called Jane [on Tuesday]$_i$ [Op$_i$ [PRO to meet with her t$_i$]]

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8. Note that the ungrammatical readings of (12c,d) correspond to the sentences in (i) and (ii); (12c,d) are grammatical if they are interpreted as single gap structures.

i) Which tool did you fix the car with after you fixed the bicycle with it?
ii) On which day did you leave Boston in order to visit Mary on that same day?

15) a. * In the living room is too crowded for Jane to fix the television t
b. * Quietly is too considerate for Jane to speak t
c. * On Tuesday is too inconvenient for Jane to come to a meeting t

As we will see below, other OWM constructions allow adjunct gaps (or adjunct antecedents for null operator chains).

Within the government-binding milieu, a subject/adjunct vs. object asymmetry, such as that displayed in (7)-(15), is immediately suggestive of the ECP. Stowell (1985a) and Cinque (1986) both incorporate the asymmetries just demonstrated into two very different revisions of the ECP. Stowell proposes to reformulate the ECP in the spirit of Jaeggli (1981) so that it is a conjunction of conditions: the Head Government Requirement and the Identification Condition, both in (16).

16) a. The Head Government Requirement (HGR): [e] must be governed by a lexical head.

b. The Identification Condition (IC): [e] must be identified by a coindexed category XP.

17) The Principle of Referential Identification (PRI):

A category α may identify another category ß iff

a. α is coindexed with ß;
b. (i) the head A of the chain containing α has a lexically specified reference (or range, where A = QP); or
(ii) α specifies the grammatical function (θ-role) of ß.

The principle in (17) defines the class of possible "identifiers" which may participate in the satisfaction of (16b). (17bii) allows a verb to identify its θ-marked complement as

well as head govern it, thereby fulfilling both clauses of the ECP. The execution of this idea follows Stowell (1981), where a slot in the θ-grid of a head receives the index of the complement assigned that θ-role. A subject or adjunct, on the other hand, must be identified by an appropriate XP antecedent, and, by (17bi), a null operator cannot be an appropriate antecedent. Thus, (17bi) is responsible for the asymmetry discussed above; explicitly, Stowell's analysis predicts that all structures involving null operator movement from the position of an adjunct or from subject position will be ruled out.

A more subtle prediction is available if the conjunction of requirements in (16) is interpreted in a particular manner. If (16a) and (16b) are independent constraints, rather than two components of a single constraint, then structures which violate only one of them might be expected to be less deviant than structures which violate both. Sentences with traces of null operator movement in the subject position of the embedded infinitival complement of ECM verbs or in the subject position of small clauses are then predicted to be somewhat less deviant than sentences with null operator traces in the subject position of complementizerless tensed sentences. In both cases traces would violate the IC, (16b), but only in the latter construction would a trace also violate the HGR.

Cinque's (1986) analysis of parasitic gaps was discussed in chapter three; therefore, I will summarize that analysis only briefly at this time. Cinque proposes a revision of the CC analysis which involves base-generating pro in the

position of the parasitic gap and imposing the conditions in (18) on A′-bound pro.[9]

18) a. pro is governed by a lexical category (≠ P)[10]
b. every maximal projection which dominates pro but does not dominate the operator A′-binding pro must be selected in the canonical direction by an X° category.

The conditions in (18) are essentially an adaptation of the Connectedness Condition of Kayne (1981, 1983), including revisions along the lines of Longobardi (1984). A′-bound pro is essentially the null counterpart of overt resumptive pronouns.

The A′-bound pro strategy is also the means of deriving tough-constructions, degree clauses and purposives, although Cinque assumes that there is a base-generated null operator in these constructions which binds the pro variable. A problem with this approach is that we would expect the A′-pro strategy to be marginal in a language which allows overt resumptive pronouns only marginally. Even if it is assumed that there is a kind of "Avoid overt Pronoun Principle" in effect in English, we would expect OWM constructions to demonstrate the degree of marginality associated with parasitic gap constructions, which they do not.

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9. Obenauer (1984, 1985) also proposes an A′-bound pro analysis for parasitic gap constructions and all gaps within islands, although he does not discuss the ramifications of this analysis for the phenomena under discussion.

10. Naturally, in preposition stranding languages the parenthesized clause is omitted.

(18a) will rule out a pro base-generated in the position of an adjunct[11] or in the subject position of a complementizerless tensed sentence. Under the assumption that ECM complement subjects and small clause subjects are governed by V, A′-bound pro is licensed to appear in these positions so long as (18b) is satisfied.

The proposals made by Stowell and Cinque both differentiate between ECM complement subjects and small clause subjects on the one hand and the subjects of complementizerless tensed sentences on the other. Under a certain interpretation, Stowell's approach predicts that the former will be marginally better than the latter, although both will be ungrammatical. Cinque predicts that the former will be completely grammatical and the latter completely ungrammatical. As we will see below, neither set of predictions is precisely correct.

In the sections which follow I will demonstrate that the generalization which Stowell and Cinque incorporate in their respective versions of the ECP is spurious. Some OWM constructions do permit adjunct antecedents for null operator-derived gaps; among those which do not, there are reasons unrelated to the ECP which account for the facts.[12] I take up the issues related to the distribution of adjunct gaps in §4.3. The point

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11. NP adjuncts might also be ruled out because they are not "referential enough" to antecede a pronoun; see Cinque (1986), p. 11.

12. Stowell notes some of the cases I will discuss and argues that in each case the chain to which the variable belongs ultimately ends in a lexical antecedent, thereby satisfying the identifiction requirement.

made in §4.4 concerning subjects is that the effect discussed above differs crucially from canonical ECP violations, in particular, the degree of ungrammaticality can be mitigated by contextual factors which do not necessarily respect the distinction encoded in (16) and (18) (i.e. ECM/small clause subjects vs. subjects of complementizerless tensed sentences).

4.3 Adjuncts and Null Operators

4.3.1 Adjuncts and OWM Constructions

It is sometimes difficult to tell whether an OWM construction involving an adjunct actually involves a null operator chain since there is no conveniently obvious gap to indicate that an element has been moved. For the moment, at least, I will continue to assume that null operator movement is involved in the sentences discussed below.

The OWM constructions which appear to take adjuncts as antecedents of null operator chains are clefts, tensed and infinitival relatives, and degree clauses. Examples are given below.

19) a. the day that we arrived
    b. the way you wear your hat

20) a. a good time to arrive
    b. a way to fix the car
    c. a place to meet

21) a. It was with a hammer that she fixed the car
    b. It was in the garden that I read the letter
    c. It was on Tuesday that I met you for lunch
    d. ?? It was very carefully that I opened the door

22) a. Tuesday is too soon to have a meeting.

b. Next month is too early to leave.
c. ? In Boston is too nearby to hold the meeting.
d. 50 mph is too fast to drive in a residential neighborhood.

The OWM constructions which never appear with adjuncts are purpose clauses and tough-constructions.

23) a. * With a hammer is dangerous for John to fix the television t
b. * Quietly is difficult for John to speak t
c. * On Tuesday is difficult for John to come to a meeting t

24) a. * I ate lunch quickly$_i$ [Op$_i$ [PRO to leave t$_i$]]
b. * I called John [on Tuesday]$_i$ [Op$_i$ [PRO to meet with him t$_i$]]

As a first step in formulating an alternative analysis of these facts, I will argue that it is not necessary to work the distribution of adjuncts in OWM constructions into a redefined ECP, but that this distribution can be accounted for in every case by other factors. (I am referring to OWM constructions which have the property that there is nothing within the domain of the null operator which would independently rule out an adjunct gap.) This is an approach which deserves attention because the group of constructions which allow adjuncts to appear does not constitute a natural class. That is, it seems very difficult to achieve a cogent reformulation of the ECP which successfully rules in adjuncts with comparatives, degree clauses, tensed and infinitival relatives and clefts, while ruling out their appearance with purposives and tough-con-

structions. To be successful the non-ECP argument[13] must accomplish slightly different tasks in dealing with the two groups of constructions. For those constructions which never appear with adjuncts it is necessary to show that independent (non-ECP related) factors rule out every possible instance of an adjunct. As may already be apparent, the second group is not uniform in its ability to appear with adjuncts and therefore, the task will be to show that the idiosyncratic distribution of adjuncts in these constructions results in each case from other properties. The argument relies in each case on some basic assumptions about the structure and derivation of the construction involved. In this section I clarify these assumptions only as much as seems necessary to indicate the existence of a non-ECP account for the distribution of adjuncts in OWM constructions; a more detailed analysis of some of these constructions appears in chapter three.

Beginning with those constructions which do not allow adjuncts, it has often been noted[14] that purpose clauses with null operator chains are only licensed when they are predicated of the THEME of a verb which is left "available" in some sense by the action it undergoes. This was discussed in detail

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13. Let me make clear that I am not arguing that adjunct traces are not subject to the ECP or that the ECP never plays a role in the distribution of adjuncts. I am arguing that the unexpected inability of some OWM constructions to appear with adjuncts (or with certain kinds of adjuncts) should not be the basis for a reformulation of the ECP, as Stowell (1985), Cinque (1987) and Obenauer (1984, 1985) argue it is.

14. See Faraci (1974), Jones (1985) and the references therein.

in chapter three; the following examples serve to illustrate the point.

25) a. * John$_i$ invited a comedian$_j$ to his house [Op$_i$ [PRO$_j$ to entertain e$_i$]]
b. * John sent Mary$_i$ a comedian$_j$ [Op$_i$ [PRO$_j$ to entertain e$_i$]]
c. * John$_j$ destroyed a chair$_i$ [Op$_i$ [PRO$_j$ to get rid of e$_i$]]

The inability of purpose clauses to appear predicated of an adjunct thus appears as part of a larger constraint governing the possible "subjects" of this sort of predicate.

A similar explanation holds for tough-constructions: even when tough-adjectives appear without the infinitival clause they cannot modify adverbials. The only adjectives which modify non-NPs (if we follow Larson (1987) in calling adverbs like fast, hard, early, late, and soon bare AP adverbs) are not members of the tough class.[15] Therefore, we should not attribute the inability of tough-constructions to appear with adjunct subjects to some property of the construction qua null operator construction.

Turning now to those constructions which do (at least under some conditions) allow adjuncts: it appears that the heads of relative clauses may only be NPs (see Larson (1987)).

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15. The rather marginal sentence in (i) appears to contradict this point, but I would probably analyze it as a reduction of (ii).

i) (As for threading this needle,) Quickly is difficult but slowly is pretty easy.
ii) (As for threading this needle,) Doing it quickly is difficult but doing it slowly is pretty easy.

This constraint alone rules out a wide range of adjuncts as possible relative heads. The adjuncts which may appear as heads of relative clauses (and therefore, by hypothesis, as antecedents of null operators) are only the "bare-NP adverbs" of Larson (1985), which are licensed to appear as adverbials (either independently or as relative heads) because they possess an exceptional case-marking feature which allows them to be licensed in non-case-marked positions. If there is a good explanation for the small class of NP adjuncts which may appear as relative heads and for the restriction that relative heads must be NPs, then an additional constraint prohibiting adjuncts in this position on the basis of an ECP violation would be redundant.

If the structure of relative clauses is as in (26), it is not obvious why relative heads should be limited to NPs.

26) $[_{NP}$ NP CP]

XP-headed adjunction structures are generally interpreted as configurations of predication, with either the subject, as above, or predicate projecting its features to the node of adjunction. Possible instances of adjoined predication structures in which the predicate projects its features upward are small clauses, clefts and topicalization structures in English.[16]

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16. For arguments that the structure of small clauses is as in (27a) see Stowell (1981), LGB, and Barriers. If small clauses are IPs then they are irrelevant for the point made in the text. Lasnik & Saito (forthcoming) argue that topicalization

27) a. I consider [$_{AP}$ [$_{NP}$ John] [$_{AP}$ very foolish]]
b. It was [$_{CP}$ [$_{PP}$ to John] [$_{CP}$ that I gave a book]]
c. [$_{IP}$ [$_{PP}$ to John] [$_{IP}$ Mary gave a book]]

The appearance of PP "subjects" of predication in (21) and (27c) indicates that whatever it is that requires relative clauses to be NP-headed should not be derived from some general constraint on what may function as the subject of a predicate.

A theory of NP determiner structure which analyses the relative clause as an optional complement of the determiner head offers a straightforward explanation for the NP-headedness of relatives: the heads which optionally select relative clauses obligatorily select NPs. (See §2.4.1 for discussion.) Although there are specifiers which appear with non-NP categories, they do not license relative-type clauses. As for the small class of adjunct NPs which may appear in the relative head position, I adopt (at least in spirit) Larson's (1985) account based on case requirements and the exceptionally case-marked status of bare-NP adverbs. The distribution of adjuncts in relative clauses is accounted for on the basis of the selectional properties of determiners and the case properties of a set of NP adverbs.

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in English has the structure in (27c) and that it is derived by SS adjunction. (27b) is plausible as a structure for clefts given that they appear with expletive it, which normally associates only with clauses.

Cleft sentences resemble tensed relative clauses in some respects, but there are interesting differences between the constructions as well. A much wider range of adjuncts is allowed in clefts than in relatives; in particular, as has already been illustrated in several examples, clefts are not limited to appearing with bare-NP adverbs. This, I would argue, is because the clause in a cleft is licensed by the predicational nature of the construction rather than by a determiner, as are relative clauses. The presence of the clause in a cleft construction does not indicate (or participate in) selection for a particular category. The difference is reflected in the structure given to (27b), and repeated in schematic form below.

28) it is $[_{CP}$ XP_i $[_{CP}$ $O_i \ldots e_i \ldots]]$

For an argument in favor of this difference between relative clause structure and cleft structure, see §2.4.

Like relative clauses, the adjuncts which appear with degree clause constructions appear to be limited to NP-adverbs, but again this fact has nothing to do with the null operator chain. Contrast the grammatical sentences in (29) with those in (30).

29) a. Tuesday is too soon.
b. April is too rainy.
c. Tomorrow is too busy.
d. 50 mph is too fast.
e. ?? That way is too dangerous. (manner)
f. ?? This direction is too dangerous.

30) a. * Loudly is too annoying.

b. * For camping trips is too boring.[17]
c. * For John to play with is too silly.

Since degree words do not stand alone but appear as specifiers or modifiers of adjectives or adverbs, it stands to reason that if there is no adjective, adverb or QP which may modify the adjunct, there will be no degree clause construction involving a null operator chain anteceded by an adjunct which is well-formed.

Turning now to the possible cases of adjuncts with degree clause constructions, when the NP-adverb in subject position is temporal the sentence is grammatical if the degree word modifies a "bare AP adverb", i.e. early, late, fast, soon, far, long (see Larson (1987)), although some adjectives are marginally acceptable with temporal adverbs as well.

31) a. Tuesday/April/next week/tomorrow is too soon/late to hold the meeting.
b. ? April is too rainy to hold the picnic.
c. ? Next week/Tuesday/tomorrow is too busy to schedule a meeting.
d. ? Tuesday/April/next week/tomorrow is too inconvenient to hold the meeting.

NPs indicating speed are also quite acceptable in these constructions.

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17. Note that more acceptable sentences can be constructed if the constituent following the copula is an NP.

i) For camping trips is a good reason to buy this tent.
ii) For John to play with is not a good enough reason to buy this pony.

32) 50 mph is too fast to drive in a residential neighborhood.

The manner adverbial this/that way is marginally acceptable with a too + adjective combination, as is the adverbial of direction this/that direction.

33) a. ?? That way is too dangerous to hold your knife.
b. ?? This direction is too dangerous to go alone.

The locatives here and there are still more marginal with degree clauses.

34) a. ?? There is too far away to build the garage.
b. ?? Here is too close to the house to build a fire.

To summarize: degree clauses are most compatible with temporal NP-adverbs and NPs of speed; adverbials of manner, direction and location are noticeably more marginal.

One of the defining characteristics of NP-adverbs is the ability to stand alone (without prepositions) in sentences, an indication of their exceptional case properties, according to Larson (1985).

35) a. Let's have the meeting Tuesday.
b. We'll leave next month.
c. He drove 70 mph all the way here.

Place names do not have the requisite case property and cause ungrammaticality when they appear without prepositions. ((36) = Larson's (3c))

36) You have lived *(on) 43rd St./*(in) Germany.

These place names are also ruled out as subjects of degree clause constructions whether the degree word modifies an adverb or adjective.

37) a. * This room is too crowded to hold the meeting.
b. * Arlington is too far to walk.

38) a. This room is too crowded to hold the meeting in.
b. Arlington is too far to walk to.

If a stranded preposition appears in the embedded clause (or if the clauses are interpreted without a gap), the construction is, naturally, grammatical, as in (38). The other option for these place names, appearing as the object of a preposition, is ruled out because PP subjects are generally unacceptable with degree clause constructions, (39); locative PPs are no exception, as illustrated in (40).

39) a. ?? On Tuesday is too soon to have a meeting.
b. ?? By next month is too early to leave.
c. ?? At 50 mph is too fast to drive in a residential neighborhood.

40) a. * In this room is too crowded to hold the meeting.
b. * To Arlington is too far to walk.

Thus, there is no way for locative adverbials to appear as subjects in degree clause constructions.

Oddly, there is a small class of NPs which, like place names, cannot appear as bare-NP adverbs, i.e. without prepositions, but which can appear as subjects of degree clause constructions. These are NPs referring to specific times or to periods of time.

41) a. 5 o'clock is too early/late/soon to leave for the airport.
b. Let's leave for the airport *(at) 5 o'clock.

42) a. Three hours is too long to listen to him.
b. We listened to him *(for) three hours.

These facts indicate the following about NP adverbs: (i) some NP adverbs which do not have exceptional case properties may nevertheless be licensed by receiving structural (at least, nominative) case; (ii) proper place names, unlike "time names" such as 5 o'clock, are not interpretable as adverbs even when case requirements are satisfied. This apparently contradicts Larson's principle of Adverbial θ-role Assignment given below.

43) Assign an adverbial θ-role to α, where α is any phrase.

It may be that proper place names are "too referential" to function as adverbs, though specifying the allowable degree of referentiality would be delicate given the ability of names like Tuesday and November to function as adverbs.

All of this indicates that an explanation of the distribution of adjuncts in degree clauses will very likely be concerned with case requirements and, perhaps, the mechanism of assigning adverbial θ-roles' It also seems reasonable to conclude that, for all the constructions discussed in this section (degree clause constructions, relatives, clefts, tough-constructions and purpose clauses), the distribution of adjuncts may be accounted for without appealing to the ECP.

4.3.2 Adjuncts and Parasitic Gaps

While the ECP is not implicated in the distribution of adjuncts (specifically, adverbials) in OWM constructions, I will now argue that it is precisely what rules out the possibility of adjunct parasitic gaps. Consider again the examples given in (12) to illustrate this phenomenon, repeated as (44).

44) a. * how did you fix the car t [after repairing the bicycle e]
b. * when did you leave Boston t [in order to visit Mary e]

In chapter three I argued that parasitic gap constructions involve the formation of a "complex chain", a chain with a single head and multiple "tails". The formation of complex chains, like all A′-chain formation, is constrained by the Subjacency Condition, repeated in (45).

45) If (α_i, α_{i+1}) is a link of a chain, then α_{i+1} is 1-subjacent to α_i.

A complex chain is a sequence, like any other chain. Thus, the sentence in (44a), with the SS representation in (46a), contains the complex chain in (46b).

46) a. how$_1$ did you [$_{VP}$ t$_1$′ [$_{VP}$ fix the car t [after [$_{CP}$ pro$_1$ [$_{IP}$ PRO [$_{VP}$ e$_1$′ [$_{VP}$ repairing the bicycle e$_1$]]]]]]]

b. (how, t′, t, pro, e′, e)

At SS this chain meets the requirements of the Subjacency Condition and the complex chain is licensed. However, at LF,

adjunct chains must meet an even stricter condition than the Subjacency Condition. At various points I have discussed two different approaches taken to explaining this effect: Lasnik & Saito's (1984; L&S) ordering of Affect α and τ-marking vs. Chomsky's (1986, class lectures) "complete representation requirement" (CRR). In §3.4 I suggested that the CRR might derive from the nature of adjunct chains as discontinuous entities and that the strict locality constraint on adjunct chains is related to a similar locality constraint on A-chains.

Given the analysis of parasitic gaps proposed in chapter three, can we guarantee that the sentence in (44a) will be ruled out? In chapter three I took the position that FI forces the deletion of any element which receives no interpretation. Under standard assumptions, the intermediate ECs in an adjunct chain receive no interpretation, yet the CRR forces all intermediate ECs in adjunct chains to be present throughout the derivation. This entails that each nonpronominal intermediate EC be +τ-marked. It is important to understand the linkage between these two requirements on intermediate ECs: bearing [+τ] alone is not enough to permit an EC to remain in a structure at LF; the presence of the EC must be required by some independent aspect of the grammar. On the other hand, nonpronominal ECs which must be present at LF must meet the requirements of the ECP, i.e. they must receive [+τ] prior to the ECP filter. What about pronominal ECs which are required to be present at LF by some aspect of the grammar? They are not sub-

ject to the ECP but we might argue that they are not licensed at LF unless they are identified, i.e. have phi-features, at LF. The A′-pro in a parasitic gap structure such as (46a) does not meet the licensing requirement for pronominals at LF and, therefore, must delete. The CRR will be violated and a parasitic gap construction involving adjunct gaps will be correctly ruled out.

The L&S approach is equally compatible with the analysis of parasitic gaps I have proposed as long as FI requires A′-pro in parasitic gap constructions to delete in the mapping to LF. Consider just the A′-pro portion of structure in (46a), given in (47).

47) ... $[_{CP}$ pro_i $[_{IP}$ PRO $[_{VP}$ e_i' $[_{VP}$ repairing the bicycle e_i]]...

If pro_i is deleted, then there will be no way for e_i' to be marked +τ. If pro_i deletes, then e_i' must also delete; but if e_i' deletes then there will be no τ-marker for the trace of origin, e_i, at LF. Therefore, when τ-marking applies after all instances of Affect α, e_i will receive [-τ] and will violate the ECP filter. Once again, sentences such as (44a) are correctly ruled out.

4.3.3 PPs in OWM Constructions

We would naturally expect non-argument PPS to pattern with adjuncts and might expect argument PPs to pattern with direct objects. However, both expectations are unfulfilled.

The distribution of PPs, whether argument or non-argument, is extremely limited. In fact, only clefts appear with PPs. Examples of clefts with non-argumental PPs appear above in (21). Examples with argument PPs are given in (48).

48) a. It was to Mary that John gave the car.
b. It was for Mary that Susan bought a gift.
c. It was on the table that I left your book.

See (13), (14) and (15) for ungrammatical examples of degree clauses, tough-constructions and purposives with non-argumental PP antecedents. Ungrammatical examples of these constructions with argumental PPs appear in (49).

49) a. * To John is too annoying to speak civilly,
b. * On that shelf is too high to put the vase.
c. * To John is difficult to speak civilly.
d. * On this small shelf is difficult to put many books.
e. * I sent a teacher to John to speak =
I sent a teacher$_i$ [to John]$_j$ [Op$_j$ [PRO$_i$ to speak t$_j$]

The only candidates for PP-headed relatives are those of the form in (50a), which were analyzed in Bresnan and Grimshaw (1978) as having the structure in (50b).

50) a. I will live in whatever town you live.
b. [$_{PP}$ [$_{PP}$ in whatever town] [$_S$ ...t$_{PP}$...]]

Larson (1987) argues instead that these sentences have the structure in (51) and are derived by means of "antecedent-contained deletion" such as that which derives VP-deletion sentences.

51) $[_{PP}$ in $[_{NP}$ $[_{NP}$ whatever town$]$ $[_{S}$ ...t_{PP}...$]]$

Larson's arguments are convincing and it seems safe to conclude that relative clauses do not appear with PP heads, presumably for the same reasons that relatives do not appear with non-NP adjunct heads: NP determiners, which license relative clauses, only select NPs.

Comparatives appear with PPs in constructions such as those in (52), which Pinkham (1984) calls "metacomparatives" and McCawley (1973) "qualitative comparatives".

52) a. I was speaking more to Mary than to Tom.
b. I fixed the car more with a hammer than with a wrench.

These differ from comparatives such as "I have more apples than John has" which compare numerical quantities. The metacomparatives in (52) can be paraphrased with <u>rather</u> comparatives, as in "I was speaking to Mary rather than to Tom." It seems plausible that metacomparatives differ from numerically quantified comparatives in not containing a null operator.

It should be clear from the preceding section that the distribution of PPs in OWM constructions may also be accounted for without recourse to an ECP-based explanation. Recall that only cleft constructions may appear with PPs, whether arguments or adjuncts. This, I have suggested, is because there is no selectional restriction on the subject of the clausal predicate. Conversely, PPs do not appear as the heads of relative

clauses or in comparatives precisely because the determiners which license these clauses do not select PPs. Finally, PPs do not appear in tough-constructions or degree clause constructions because the AP heads in each case may not modify PP.

4.4 The Distribution of Subject Gaps

In this section I will introduce a great deal of data concerning the distribution of subject gaps in OWM constructions and parasitic gap constructions. Very often judgements will be delicate, but I believe the contrasts illustrated are real and significant.[18] The three types of subject gaps which will be examined should be familiar from the introductory discussion in §4.2.2: ECM subjects, small clause subjects and the subjects of complementizerless tensed sentences. Two things, which I believe are crucial to sorting out this complex question, will become apparent as the data unfold: (i) that the ungrammaticality signalling the phenomenon may be suborned by manipulation of lexical items; (ii) that tensedness plays an important role in the grammaticality of these constructions, whether the trace of null operator movement is in subject or object position. Although I have taken the position that the facts presented in this section do not support

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18. Since it will be necessary in this section to distinguish subtle differences in grammaticality, I will use a slightly more elaborate system of notation than I have used up to this point. The diacritics I will use are given in (i) and are ordered in ascending order of ungrammaticality from left to right.

i) ? - ?' - ?? - *? - *' - *

the generalizations expressed by the analyses of Stowell and Cinque, it will become clear that the situation described is not all anarchy. There are generalizations to be made concerning the distribution of subject gaps and in this section and in §4.5 I will make what I consider to be the correct ones and offer a plausible account of the distribution of subject gaps in these constructions.

4.4.1 Two Groups of OWM Constructions

The first point to be made is that there are some OWM constructions which freely allow subject gaps in the three target contexts. These include tensed relatives (53), clefts (54), and comparatives (55).

53) a. the woman that I expect t to win the race
b. the woman that I think t won the race
c. the woman that I consider t intelligent

54) a. It was Jane that Mary expected t to win the race
b. It was Jane that Mary thought t won the race
c. It was Jane that we all considered t intelligent

55) a. I registered more students than I expect t to show up
b. I registered more students than I think t will show up
c. ?? I registered more students than I consider t qualified to take the course.[19]

These three constructions share three other properties which set them apart from the remaining OWM constructions as well:

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19. I have no explanation for the marginality of small clause subjects with comparatives.

they are all obligatorily tensed[20]; they optionally appear with overt wh-operators; and the "highest" embedded subject is exempt from the that-t effect. These properties will now be illustrated in turn.

That the tensed/infinitival distinction holds is illustrated by the ungrammaticality of (56) and (57).

56) a. * John is easy that anyone likes e
b. * John is too angry that anyone could talk to e
c. * John bought the dog for his kids that they could play with e

57) a. * It is John for Bill to like e
b. * John ate more apples than for me to pick e
c. * John runs more often than for me to lift weights

In making the tensed/infinitival distinction I am referring to those instances of these constructions which host null operators. Adjectives of the tough class are known to take tensed sentential complements in the non-tough-construction configu-

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20. This is tautological with respect to tensed relatives, but the point I wish to make is that, with resepct to the other defining properties of the "tensed group", tensed relatives pattern with clefts and comparatives while infinitival relatives do not.

Another point which should be clarified is that the clauses I refer to here as tensed or infinitival are the clauses containing the null operator chain, not the matrix or embedded clause containing the OWM construction as a whole. For example, in a cleft construction, such as that in (i), the clause which determines that it is a member of the tensed group is α not ß. As shown in (ii) and (iii), ß may be infinitival, but α may never be.

i) It was John that Bill nominated.
\ \ α /
\ ß /

ii) I didn't expect it to be John that Bill nominated.
iii) * I think that it was John for Bill to nominate.

rations shown in (58), but these constructions do not support null operators.

58) a. It is difficult for Bill that John won the race.
b. It is dangerous for the community that W.R. Grace dumps toxic waste.

In order to purposives, RatCs in the terminology of chapter two, may also be tensed for some speakers. Others, such as myself, find sentences such as (59) marginal or at least stilted.

59) We went to Paris in order that Mary might visit the Louvre.

However, RatCs never appear with null operators either.

On the other hand, there are cases of comparatives which appear to take infinitival clauses, such as (60).

60) a. It's cheaper to repair the stereo now than to buy a new one later.
b. It's more dangerous to ride in a car than to fly in an airplane.

There are two ways to look at these sentences which preserve the generalization about the tensed and infinitival groups. The first is to regard them as reductions of full sentences, with (60b) being an elliptical version of (61), for example.

61) It's more dangerous to ride in a car than it is to fly in an airplane.

Alternatively, the infinitives in (60) can be viewed as the compared entities with no reduction involved. This is a bit

difficult to see in the extraposed structures in (60), but compare (62) and (63).

62) To ride in a car is more dangerous than to fly in an airplane.

63) Chèvre is better than Velveeta.

Without going any deeper into the analysis of comparatives, I take it as demonstrated that the tensed/infinitival distinction is valid.

That the members of the tensed group can also appear with overt wh-operators while the members of the infinitival group cannot is illustrated by the sentences in (64) and (65).

64) a. It was Mary who won the race.
b. the woman who won the race.
c. John has more money than what I have.[21]

65) a. John bought it (*which/what) to play with.
b. a person (*who) to invite
c. John is too aggressive (*who/whom) to invite.
d. John is easy (*who/whom) to please.
e. This view is pretty (*which) to look at.

There is a weak point in the overt operator generalization: infinitival relatives may appear with pied-piped wh-operators, as shown in (66).

66) a person to whom to give the awful task of sorting through these papers

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21. The appearance of overt wh-operators in comparatives is restricted to certain dialects, but the dichotomy still holds: there are no dialects which permit overt wh-operators in degree clauses, tough-constructions or purpose clauses nor did these constructions appear with overt wh-operators at any prior stage in the development of the language. On infinitival relatives, see below.

For now I will put aside this problem and assume that the generalization holds.

Finally, the "highest" embedded subject in the constructions of the tensed group do not appear to be sensitive to the that-t effect.

67) a. the woman that t won the race
b. It was Jane that t won the race.
c. More students showed up for class than t had registered.

The grammaticality of (67b) suggests that the cleft complementizer is of the relative clause-type, one which, if we follow the spirit of Pesetsky (1982), may take on the index of the null operator in SPEC of CP and directly bind the subject variable. If comparative <u>than</u> is a complementizer then we would have to say the same for it, a somewhat less appealing position. However, if it is a preposition with a sentential complement, as in (68), no that-t effect is expected.

68) ...$[_{PP}$ than $[_{CP}$ O_i $[_{IP}$ t_i ...

Having demonstrated that the tensed group of OWM constructions, which allows subject gaps freely, differs systematically in several ways from the infinitival group, I will now leave aside the tensed group for the moment and examine the distribution of subject gaps in parasitic gap constructions and the members of the infinitival group.

4.4.2 Parasitic Gaps as Subjects

The purpose of this section and the next one will be to demonstrate that the phenomenon illustrated by (7) - (11) is neither uniform nor general. One argument against attributing the ungrammaticality of (7) - (11) to the ECP is found in Barriers, where Chomsky argues that the stronger contrast is between sentences such as (69a,b) and (69c), not between (69a) and (69b,c) as he argued in CC.

69) a. which sonata did you play t without believing Mary liked e
b. which sonata did you play t without believing e pleased Mary
c. which sonata did you play t without believing that e pleased Mary

I concur with the Barriers position. An identical argument may be made based on the constrast between (70a,b).

70) a. Which book did you buy t for Mary without ever understanding why she liked e
b. Which woman did you visit t without ever figuring out why/whether e liked you

Taking into account the increased complexity of these sentences and the wh-island embedded in the parasitic domain, it is still clear that (70b) is much more strongly ungrammatical than (70a), which I find only somewhat marginal. Assuming then that the ECP accounts for the strong ungrammaticality of (69c) and (70b), the task is to account for the marginality of (69b) and (70a).

Turning now to the phenomenon proper, I repeat the data

originally adduced to show their sensitivity to the subject gap effect.[22]

71) a. * the book that you bought t without believing e pleased Mary
b. * the person you telephoned t before e left the country

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22. In Appendix I of Chomsky & Lasnik (1977; hereafter C&L) it is argued that the contrast between (i) and (ii) is due to the constraint in (iii), emphasis added. (Judgements are as given in C&L.)

i) someone that I believe Freddy has visited as many times as my brother has visited
ii) * someone that I believe has visited Freddy as many times as has visited his brother.

iii) In paired structures such as [(iv)], optionally delete a pronoun in the second member of the pair if trace appears in the corresponding position in the first member; acceptability of the result varies from high to low as the position of the deleted item ranges from the end to the beginning of the clause.

N. Chomsky (p.c.) suggests that a similar constraint might be at work in creating the subject/object asymmetries discussed in this section. The principle in (iii) applies as is to parasitic gap constructions but assume that we can generalize the principle to OWM constructions as well, even though they do not involve paired gaps. (iii) then predicts that (vi) should be worse than both (v) and (iv).

iv) John is too arrogant for us to convince Mary that we like e
v) * John is too arrogant for us to convince Mary e likes her
vi) ? John is too arrogant for us to convince t that Mary doesn't like him

(vi) improves even more when the embedded complement is an infinitival:

vii) John is too arrogant for us to convince t [PRO to be nice to Mary.

The strong contrast between (v) and (iv)/(vi)/(vii) suggests that we cannot account for these facts by appealing to a linear constraint.

(71a) seems markedly more acceptable than (71b). As above, when (71a) is compared with (72), the latter seems to be the stronger violation.

72) * the book that you bought t without believing that e pleased Mary

(71b), on the other hand, seems quite as bad as (72). Larson (1984) argues that when temporal prepositions appear with sentential complements, there is a null temporal operator in the SPEC of CP, as shown in (73a).

73) a. ... [$_{PP}$ before [$_{CP}$ O_t [$_{IP}$ ...e_t...]] ...

If the structure in (73a) is part of the SS representation of (71b), as shown in (73b), then A′-pro will not be in position to τ-mark its trace.

73) b. ... [$_{PP}$ pro_i before [$_{CP}$ O_t [$_{IP}$ e_i...e_t...]] ...

(71b) is correctly predicted to be an ECP violation. However, if all temporal prepositions take null temporal operators in the SPEC of their sentential complements, then movement of pro from object position will cross an additional barrier: the complex chain in a grammatical parasitic gap construction like (74) is predicted to be ungrammatical.

74) Which article did you file t after reading e?

An ECP account of (71b) appears to be incompatible with the analysis of parasitic gap constructions in chapter three. Notice, however, that the ECP-type effect occurs even in cases where the preposition involved is not a temporal one.

75) a. * Which article did you xerox t because e contained an analysis of parasitic gaps?
b. * Which guy did you visit t even though e dislikes you?

An explanation of these facts which is compatible with the parasitic gap analysis of chapter three is one which analyzes the sentential complements of the prepositions which show these ECP effects as IPs, rather then CPs.

76) ... [$_{PP}$ pro$_i$ before [$_{IP}$ e$_i$...]] ...

The sentences in (75) and (71b) are then ECP violations on a par with (69c).[23]

Larson's proposal was made to account for the ambiguity of sentences such as (77a), first discussed by Geis (1970).

77) a. I saw Mary in New York before she claimed that she would arrive.
b. I saw Mary in New York before she made the claim that she would arrive.
c. I saw Mary in New York before she asked how to fix the car.

(77a) is ambiguous with respect to the scope of the temporal preposition: I might have seen Mary before the moment when she spoke the words, "I will arrive on Sunday," or I might have

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23. This analysis is inconsistent with the relativized minimality condition suggested in §4.6, however.

seen her before her projected time of arrival. Neither (77b) nor (77c) are similarly ambiguous. The ambiguity arises in (77a) because the null temporal operator (see (73a) above) may originate in either clause of the prepositional complement and move to the SPEC of CP without violating any constraints. In (77b,c) barriers will be crossed if the null operator moves from the most embedded clause; therefore, only one interpretation is available. If the complement of the P is IP, there is no SS landing site for the temporal operator. There are two possible ways to account for the ambiguity while maintaining that the PP complements in question are IPs. First, the null temporal operator might move at LF to an IP adjoined position, instead of moving at SS to SPEC of CP. Adjoined to IP it would be governed by the preposition, a requirement under Larson's analysis; Note that since the temporal operator is an adjunct, the loss of ambiguity in (77b,c) is a result of an ECP violation, not of a Subjacency Condition violation. Even if subjacency is not relevant at LF, LF movement of the temporal operator would be expected to produce the desired effects.[24] The

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24. This point is not actually as straightforward as it might seem. In the case of (77c), for example, successive cyclic movement of the temporal operator, including transient adjunction to the lower IP, results in the structure in (i).

i) ... $[_{PP}$ before $[_{IP}$ O_i $[_{IP}$ ... $[_{VP}$ t_i^3 $[_{VP}$ ... $[_{CP}$ how $[_{IP}$ t_i^2 $[_{IP}$ ... t_i^1 ...]]]]]]]

Only a segment of IP dominates t_i^2 and segments of BCs do not transmit barrierhood to other BCs in the Barriers system. CP will not be a barrier for t_i^2 since it does not dominate a BC for t_i^2. Therefore, a minimality condition is needed which will prevent t_i^3 from antecedent governing t_i^2. The minimality condition in Barriers will have this effect only if the V'

second possibility is that the selectional requirements of the preposition are satisfied by INFL, the repository of TNS. Since the preposition in (76) governs IP, by convention, it governs INFL and the selectional requirements would be satisfied. The ambiguity of (77a) might be the result of head-to-head movement, an anaphoric relation between the complement INFLs, or LF movement (i.e., QR) of the most embedded IP (or perhaps just the most embedded TNS marker). In any case, it seems plausible that a straightforward ECP account can ultimately be given for the ungrammaticality of (71b) and (75).

The complete paradigm of examples relevant to the subject gap question should include the three crucial configurations: ECM verbs with infinitival complements, small clauses and embedded, tensed, complementizerless clauses, as well as object gap versions of these sentences for comparison. The paradigm for parasitic subject gaps is in (78) and parasitic object gaps in (78′). Recall that a single question mark is

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projection is present in (i). However, in (iii), which is a simplified portion of the structure of (ii), the V′-level may fail to project and, in fact, must do so for the sentence to be grammatical.

ii) What do you think that John ate t

iii) wh_i $[_{IP}$ ... $[_{VP}$ t_i' $[_{VP}$ V $[_{CP}$ t_i ...

If V′ may fail to be present in (iii), there is no way to prevent its absence in (i), in which case (77c) is incorrectly predicted to be ambiguous. The relativized minimality condition in §4.6 is also unable to rule out the structure in (i). On the other hand, prohibiting transient adjunction to IP by the temporal operator would give the right results. The points raised in this footnote are also relevant for any account of quantifier scope which relies on the ECP but allows transient adjunction to IP.

the standard judgement for well-formed parasitic gap constructions.

78) a. ?? the horse that you bet on t because you expected e to win the race
b. *? the professor that you consulted t without believing e to understand the problem
c. ?? the professor that you consulted t because you thought e understood the problem
d. ? the person that you hired t without considering e really qualified for the job

78′) a. ? the horse that you bet on t because you expected Bill to ride e
b. ?? the problem that you presented t without believing him to understand e
c. ? the problem that you presented t because you thought he understood e

To my ear, the contrast between subject gaps and object gaps is clearly discernible but distinctly less sharp than we would expect from an ECP asymmetry. Moreover, when the verb of an ECM complement is <u>be</u> or a modal, it is possible to construct parasitic gap sentences with subject gaps which are as fully acceptable as those with object gaps.

79) a. ? the person that you hired t without believing e to be fully qualified
b. ? the professor that you consulted t because you thought e would understand your problem
c. ? the dog that you got rid of t because you thought e might bite someone
d. ? the dog that you got rid of t because you thought e had bitten someone

Some speakers find that the tensedness of both embedded clauses in (79b,c,d) results in a stronger violation than with a normal parasitic gap construction, but this increased

deviance is present also when the gap is in object position and is therefore irrelevant to the immediate point at hand.

4.4.3 The Infinitival Group

Let us begin by reexamining the data given in §4.2.2 to illustrate the failure of subject gaps in the infinitival group. The paradigms given in (7) - (10) were incomplete with respect to our three crucial configurations; I have added the missing examples below and given sentences with object gaps for comparison. I will refrain from discussing the examples in detail until the first group of relevant data has been presented.

Beginning with the degree clauses, the small clause example (80d) is noticeably more acceptable than (80a,b,c).

80) a. * Mary is too sick for us to expect e to recover
b. * Mary is too inexperienced for me to believe e to understand the problem
c. * Mary is too sick for Jane to think e left the hospital
d. ?? Mary is too arrogant for anyone to consider e charming

80′) a. ? Mary is too sick for Jane to expect us to visit e
b. ?? This problem is too complex for me to believe Mary to understand e
c. ?? Mary is too sick for Jane to think (that) we visited e

Interestingly, the sentences in (80′) are marginal (although to varying degrees) even though they involve movement from an object position.

Next are tough-constructions and, again, the example

involving a small clause, (81d), is significantly better than the other examples.

81) a. * Mary was difficult for Jane to expect e to recover
b. * Mary is easy for me to believe to understand the problem
c. * Mary was difficult for Jane to believe e had left the hospital
d. ? Mary was difficult for anyone to consider e arrogant

81′) a. * Mary$_j$ was easy for Jane$_i$ to expect PRO$_i$ to like e$_j$
b. ?? This problem is difficult for me to believe Mary to understand e
c. * Mary was difficult for John to believe we had not visited e in the hospital

Strikingly, the cases involving object gaps, (81′), are as bad, in some cases, as those involving subject gaps.

Infinitival relatives with embedded subject gaps repeat the pattern established with degree clauses and tough-constructions.

82) a. * He is not [a man for us to expect e to succeed]
b. * He is [an employee for the boss to think e likes his work]
c. * Jane finally found [an accountant to believe e likes his work]
d. ?? Jane finally found [an accountant to consider e a friend]

82′) a. ?? He is not [a man (for us) to expect Bill to like t]
b. * They found [a man to believe their friends to respect t]
c. ?? He is [a man for the boss to think (that) the employees like t]
d. ?? John finally found [someone to believe (that) the employees like t]
e. ? They found [a man to believe (that) they could respect t]

I find the examples with subject gaps (except for (82d)) uniformly ungrammatical, but there seems to be considerably more variation among the object gap cases.

With purpose clauses, however, there is less contrast between the sentences with subject gaps and those with object gaps. In addition, the small clause example, (83c), shows little, if any, contrast with the other subject gap sentences and is significantly worse than the small clause examples above, (80d), (81d) and (82d).

83) a. * I sent the present$_i$ to you$_j$ [PRO$_j$ to expect e$_i$ to please your children]
b. * I brought Jane$_i$ to the party for you to think e$_i$ likes me
c. ?* I didn't hire Jane for you to consider e your secretary

83′) a. * I bought the dog for you to believe Mary to like e
b. * I invited Jane to the party for you to think that I like e
c. ?* I invited Mary to the party for you to convince Bill to dance with e

The exception among the purpose clauses with object gaps is (83c′), which is surprisingly good, a result which I attribute to the nature of the verb convince.

The relevance of the data in (80) - (83) is somewhat compromised by the difficulty of embedding in these constructions the sort of verbs which allow long-distance subject extraction. It may be that these constructions are semantically incompatible with epistemic verbs. Considering just purpose clauses for the moment, the problem could be a semantic conflict between the purposive interpretation and the epis-

temic verb or it could be a requirement that the semantics of the purpose clause demands an agentive subject. Since the subjects of epistemic verbs are not agentive, there is a clash. The contrast between (83'c) and (83'a,b) suggests that something like this explanation is on the right track.

If the source of the ungrammaticality of (80) - (83) has to do with the epistemic verbs used in the examples, then we might expect that these constructions would improve if these verbs are more deeply embedded. The data bearing on this prediction, in (84) - (87), are not very sharp.

84) a. ?' We found [a horse to tell John to expect e to win the race]
b. ?' Bill finally found [an accountant to tell John to consider e a friend]
c. * What we need is [an accountant to tell John that we think e understands the problem]
d. * What we need is an [an employee for John to announce that the boss thinks e likes his work]

85) a. * I gave the article$_i$ to John$_j$ [PRO$_j$ to tell my students to expect e$_i$ to appear in the syllabus]
b. * I brought Mary here [for John to tell everyone to consider e a friend]
c. * I showed my uniform$_i$ to you$_j$ [PRO$_j$ to tell the dean that you think e$_i$ meets dress code]
d. * I brought my novel to the office to announce that the boss thinks e will will a prize.

86) a. * John is difficult to tell Mary to expect e to recover.
b. *' This dog is dangerous to tell Mary to consider e a pet.
c. * This book is an honor to announce that the committee thinks e will win a prize.[25]

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25. That an honor is a member of the tough class of predicates is shown by the grammaticality of (i), (ii) and (iii).

i) It is an honor to receive this prize.
ii) To receive this prize is an honor.
iii) This prize is an honor to receive.

87) a. * John is too sick for us to tell Mary to expect e to recover.
b. *? John is too sleazy for us to tell Mary to consider e a friend.
c. *? This book is too controversial to announce that we think e deserves the prize.

As for the prediction, the only improvement at all apparent is in the case of ECM verbs in infinitival relatives, but even this is slight. The extra embedding required to construct the examples in (84) - (87) might cancel out the positive effects of embedding.

To summarize the results of this data parade: a significant degree of the ungrammaticality associated with subject gaps in these constructions may be attributed to the nature of the verb, the depth of embedding and the islandhood of embedded tensed clauses. The last factor in particular degrades the sentence so markedly as to obscure almost totally the difference between subject and object gaps. The most sensitive of the OWM constructions to these effects is the purpose clause. The least sensitive appear to be infinitival relatives and degree clause constructions. Finally, the data suggest that, in spite of the three obscuring factors just mentioned (and others which may be undetected) subject gaps do seem to result in a somewhat greater degree of deviance than object gaps in these constructions. However, I think the data above have also shown that we are not dealing with a violation of the degree or stability usually associated with ECP violations. In fact, the sensitivity to lexical items and tensedness suggest some-

thing more akin to a Subjacency Condition violation. I leave this as an observation for the moment and continue with the presentation of some additional data bearing on the question at hand.

The mitigating effect of be and certain modals is also apparent with OWM constructions, though to a lesser degree. The greatest improvement is seen when the ECM verb believe takes be as a complement verb, as illustrated in (88).

88) a. ? What we need is [someone for them to believe e to be a spy]
b. ?? They found [a man to believe e to be the Messiah]
c. ?' John is difficult to believe e to be a spy.
d. ?? John is too inept for me to believe e to be a spy.

The increased acceptability is most noticeable with infinitival relatives, but also perceptible, I think, with tough-constructions and degree clauses. Purpose clauses are consistent with their earlier behavior in showing virtually no improvement with the believe e to be configuration.

89) a. * I gave it$_i$ to him$_j$ [PRO$_j$ to believe e$_i$ to be a gift]
b. * I brought John to the party for you to believe e to be my friend2

Modals seem to have a lesser effect on the OWM constructions, as shown in (90) and (90').

90) a. ? What we need is [someone for them to believe/think e might actually kidnap the President]
b. ? What we need is [someone for them to believe e has escaped]
c. * John is difficult to think e might be a spy.
d. *? John would be difficult to believe e would ever do something like that

e. * That drug is easy to believe e could harm someone.
f. * John is too good-hearted for me to believe e could ever harm anyone
g. *? That movie was too innocuous for me to believe e has offended you
h. * I gave it$_i$ to him$_j$ [PRO$_j$ to think e$_i$ might be a sign of my affection]
i. * I brought John to the party for you to believe e could be a gentleman

90′) a. ? What we need is [someone for them to believe/think we might actually kidnap e]
b. ? What we need is [someone for them to believe we have kidnapped e]
c. * John is difficult to think we might offend e
d. ?? John would be difficult to believe someone could ever dislike e so much
e. *? That drug is easy to believe the Mafia could be selling e
f. ?? John is too good-hearted for me to believe anyone could ever dislike e
g. *? That movie was too innocuous for me to believe you disliked e so much
h. * I gave it$_i$ to him$_j$ [PRO$_j$ to think Mary might want e$_i$ as a sign of my affection]
i. * I brought John to the party for you to believe I could be nice to e

As we have seen before, the purpose clauses in (90) and (90′) are strongly ungrammatical with both object and subject gaps. In contrast, I find the infinitival relatives in both (90) and (90′) virtually perfect. The fact that OWM constructions do not show the kind of marked improvement with modals which we saw in the case of parasitic gap constructions is consistent with the evidence from (80) - (83) that infinitival OWM constructions are extremely sensitive to tensedness, embedding and the presence of epistemic verbs.

To conclude this section: the data reviewed suggest that there is a contrast between OWM and parasitic gap constructions with subject gaps and those with object gaps, but it is

a weaker contrast than the subject vs. object asymmetry associated wth canonical ECP effects. Moreover, we have seen that OWM constructions in particular are very sensitive to the semantic class of the verbs with which they appear and to the islandhood of tensed embedded clauses.

4.4.4 Subject Gaps in Islands

At this point it makes sense to ask whether the weak contrast between variables in subject position and those in object position obtains in any other context. In this section I will argue that extraction of subjects from islands does create a stronger violation than extraction of objects, that is, the weak subject/object asymmetry of the preceding sections holds in constructions other than those hosting null operators. Compare the pairs of relative clauses in (91), for example.

91) a. ?? Which guy$_i$ did John wonder when to expect t$_i$ to show up
a.′ ? Which gift$_i$ did John wonder when to expect PRO to receive t$_i$

b. ?? Which student$_i$ did John wonder whether to believe t$_i$ understood the problem
b.′ ? Which problem$_i$ did John wonder whether to believe Bill understood t$_i$

c. ?? Which guy$_i$ did John deny the rumor that you think t$_i$ likes Mary[26]

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26. Most people find CNPC violations slightly worse than wh-island violations, especially when the wh-islands involve infinitivals. However, the CNPC violation examples I use do not seem to me to be as bad as, for instance, Subject Condition violations. Rather than increase the complexity of my notational system, I will mark for contrast in this case and

c.' ? Which guy$_i$ did John deny the rumor that you believe Mary to like t$_i$

Complexity once again makes judgements difficult, but it seems that the examples involving object extraction are more acceptable than those involving subject extraction. However, as with the cases we saw in the previous section, the increased deviance of the subject examples does not reach the level of an ECP violation, as can be seen by comparing (91b,c) with (92a,b).

92) a. * Which student$_i$ did John wonder whether to believe that t$_i$ understood the problem
b. * Which guy$_i$ did John deny the rumor that you think that t$_i$ likes Mary

We saw above that the best examples of subject gaps were found with small clauses, ECM complements with <u>be</u> and tensed, complementizerless embedded sentences with modals. These contexts also improve subject gaps within islands.

93) a. ?' Which guy$_i$ did you wonder whether we considered t$_i$ a fool
b. ?' Which guy$_i$ did you wonder whether we believed t$_i$ to be fully competent
c. ?' Which professor$_i$ did you wonder whether I thought t$_i$ would understand your problem
d. ?' Which dog$_i$ did you wonder whether I thought t$_i$ had attacked someone

e. ?' Which guy$_i$ did John deny the rumor that you believed t$_i$ to be mentally incompetent
f. ?' Which dog$_i$ did John believe the claim that you thought t$_i$ would bite someone

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leave it to the reader to compensate for the increased marginality of CNPC violations.

That some of the sentences in (93) do not improve to the same level of acceptability as the parasitic gap constructions above is not surprising given that some of the examples of island constructions in (92) are more deviant than parasitic gap constructions to begin with.[27]

The examples above all involved either wh-islands or complex NPs. Pesetsky (1982) noticed that a similar effect holds with extraction of subjects from adjunct islands.

94) a. * the man$_i$ that John went to the interview without expecting t_i to show up for it
a.' ?? the gift$_i$ that John went to the party without expecting PRO to receive t_i

b. * the student that John finished the lecture without believing t_i understood the problem
b.' ?? the problem$_i$ that John finished the lecture without believing Bill understood t_i

c. * the man$_i$ that John went to the police because he believed t_i to have stolen a car
c.' ?? the car$_i$ that John went to the police because he believed Bill to have stolen t_i

Once again, it seems the cases of subject extraction are significantly worse than those of object extraction. Except for small clauses, the contexts discussed above which improve subject extraction seem to have very little effect on these cases.

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27. The exception is extraction configurations of the form

i) what did you wonder how to fix

where a direct object is taken out of an infinitival wh-island. Most speakers, including me, find these grammetical.

95) a. *? the man$_i$ that John went to the interview without expecting t$_i$ would show up for it
b. *? the student that John finished the lecture while believing t$_i$ to be asleep
c. ?? the man$_i$ that John went to the police because he considered t$_i$ a thief

The data in this section indicate that what I have been calling the "weak" subject/object asymmetry apparent in some OWM constructions and parasitic gap constructions is also in effect with extraction from wh-islands, adjunct islands and complex noun phrases.

The means to account for this weak asymmetry lie close at hand within the Barriers-style framework I have adopted. The data which have been reviewed in this and the previous section lead to the conclusion that the bounding constraints on subjects are stricter than those on objects. I propose that this asymmetry be encoded in a relativized Subjacency Condition which takes into account the nature of the position from which A′-movement originated. Representationally, we can characterize this as taking into account the nature of α_n in a chain $C = (\alpha_1, \ldots, \alpha_n)$. Thus, if α_n is a complement, C is a complement chain; if α_n is a non-complement, C is a non-complement chain. Non-complement A′-chains must meet 0-subjacency, while the links of complement A′-chains must meet

1-subjacency.[28,29] This is incorporated into the Subjacency Condition as shown in (96).

96) a. If (α_i, α_{i-1}) is a link of a chain C, then α_{i-1} is n-subjacent to α_i.

b. (i) If C is a complement chain, then n=1.
(ii) If C is a non-complement chain, then n=0.

97) ß is n-subjacent to α if there are fewer than n+1 barriers for ß which exclude α.

The question of how to "quantify" Subjacency Condition violations now arises. The non-relativized version of the Subjacency Condition proposed in Barriers had n=1 for all chains. The optimal case was one in which no barriers intervened between the members of a chain link. The intervention of a single barrier between any α_{i-1} and α_i resulted in a mild violation and the intervention of two barriers resulted in a CED-level violation, i.e. something weaker than an ECP violation but stronger than a simple wh-island violation. It is possible to maintain something like this apprcach if we say

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28. The complex chains which characterize parasitic gap constructions must be viewed as follows: assume (i) is a complex chain with e_i (the parasitic gap) in a non-complement position and t_i in a complement position.

i) $(wh_i, \ldots t_i, pro_i, \ldots . e_i)$
$\underbrace{\qquad}_{a} \quad \underbrace{\qquad\qquad}_{b}$

Segment b of the complex chain is subject to the non-complement version of the Subjacency Condition in (96) and segment a is subject to the complement version.

29. I use the terms "complement" and "non-complement" rather than "subject" and "object" for generality. The effect of the stronger subjacency requirement on adjuncts will be obscured by the effects of the ECP.

that the intervention of zero barriers between the links of a chain results in grammaticality and the intervention of n+1 barriers results in a CED-level violation. This means that when only one barrier intervenes between two links of a chain with α_n in subject position, a strong violation will result. To incur a similarly strong violation, a link in a chain with α_n in a complement position must be broken by two adjacent barriers. A third option exists for complements, the intervention of one barrier, and this results in mild deviance.

The ungrammaticality which we observed with subject gaps in OWM constructions, parasitic gap constructions and extraction from islands may now be analyzed fundamentally as a Subjacency Condition violation. The different degrees of ungrammaticality reflect additional factors which add to or minimize this underlying violation. For example, the "weak" islandhood of tensed IPs (see Barriers, p. 37ff) will have a stronger impact on the grammaticality of a sentence involving subject extraction than on the grammaticality of one involving object extraction. Add to this the incompatibility of some of the constructions examined with many of the verbs which allow embedding and the level of grammaticality deteriorates even further. There are many related questions to be dealt with, in particular, the "weak" barrier status of tensed IP/CP and the relevance of lexical subjects to the barrierhood of IP. Some of these questions will be taken up in §4.5, but for now I will leave them aside in order to examine a subject/object asymmetry in Italian and French.

4.4.5 Obligatory Intermediate ECs

Verbs which are members of the class including French croire and Italian ritenére have the peculiar property of being ungrammatical with lexical subjects and grammatical with wh-moved subjects.[30] ((98a),(99a)=R, (98b),(99b)=K)

98) a. * Ritieni Gianni essere intelligente.
'You believe John to be intelligent.'
b. * Je crois Jean être le plus intelligent de tous.
'I believe Jean to be the most intelligent of all.'

99) a. il ragazzo che ritieni t essere intelligente
'the boy that you believe t (to) be intelligent'
b. Quel garçon crois-tu être le plus intelligent de tous?
'Which boy do you believe to be the most intelligent of all?'

Kayne (1981) and Rizzi (1982) argue that sentences such as those in (98) are ungrammatical because the subject fails to be case-marked in its SS position; where English allows CP-deletion to permit exceptional case-marking across the IP boundary, Italien and French do not. The CP boundary remains intact in the French and Italian sentences and blocks assign-

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30. Some of the data in this section are taken from Rizzi (1982), Cinque (1986, 1987), Kayne (1981) and Obenauer (1984, 1985). Examples taken from these sources will be marked with the appropriate initial and, where necessary, date; for example, ((1a), (2a) = R, (1b), (2b) = K) signifies that (1a) and (2a) are from Rizzi (1982) and (1b), (2b) are from Kayne (1981).

ment of case to the subject of the infinitival.[31] Successive cyclic movement through SPEC of CP in (99) leaves a trace which is accessible to case-marking, as shown in (100).

100) ... V $[_{CP}$ t' $[_{IP}$ t ...

The A'-chain thereby receives case and the structure is licensed.

Before discussing the croire/ritenére class of verbs any further, let me review a few facts about extraction from wh-islands in Italian and French. Rizzi (1982) pointed out that extraction from within the most deeply embedded clauses in a structure such as that in (101) is grammatical if CP~ is infinitival and ungrammatical if it is tensed. Sportiche (1981) argues that the same is true for French. The relevant sentences are given in (102) and (103). ((96)=R, (97)=S)

101) wh_i ... $[_{CP}$ wh_j ... $[_{CP}$~ ... t_i ...
↑_____|

102) a. * Mario, che non immagino perché tu abbia deciso che non incontrerai, è una brava persona.
'M., that I do not imagine why you have decided that you will not meet, is a nice fellow.'

b. ? Mario, che non immagino perché tu abbia deciso di non incontrare, è una brava persona.
'M., that I do not imagine why you have decided not to meet, is a nice fellow.'

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31. The Rizzi/Kayne analysis of these constructions is incompatible with the imposition of a head government requirement on traces. Under the assumption that untensed INFL is not a licit head governor, (99) will be incorrectly ruled out. It may be that in French and Italian the verb optionally moves to INFL when INFL is untensed, perhaps at LF, providing a proper governor for the subject trace.

103) a. * Voilà quelqu'un à qui je sais lequel je crois que j'offrirais.
'Here is someone to whom I know which one I think I will offer.'

b. ? Voilà quelqu'un à qui je sais laquelle je veux écrire.
'Here is someone to whom I know which one I want to write.'

If the embedded infinitival relative is an infinitival question itself, it has the same effect as a tensed complement clause, i.e. an island violation results. ((104)=R)

104)* I tuoi ospiti, che non immagino chi sappia dove portare, ...
'Your guests, that I do not imagine where to take, ...'

Rizzi points out that the infinitival complements of the croire/ritenére class of verbs act like infinitival questions rather than like other infinitival complements in that they trigger the wh-island effect. This is illustrated in (105). ((105)=R)

105)* Un simile riscatto, che mi domando quante persone ritieni poter pagare, è altissimo.
'Such a ransom, that I wonder how many people you believe to be able to pay, is extremely high.'

The ungrammaticality of (105) supports the analysis of this class of verbs proposed by Rizzi and Kayne.

An unexpected property of this class of verbs is that they are sensitive to extraction of their subjects from within islands.[32] The examples below indicate this effect with wh-

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32. This was pointed out by Rizzi (1982) for wh-islands and by Kayne (class lectures, 1983). This phenomenon is discussed at length in Cinque (1987). Rizzi's example is given in (i).

islands, (106), extraposed subjects, (107), and PP adjuncts, (108). ((106),(107)=C87, (108)=C86).

106) a. * L'unica persona che non sapevo come potessero ritenere essere una spia, ...
b. * La seule personne que je ne savais pas comment ils pouvaient croire être un espion, ...
'The only person who I did not know how they could believe t to be a spy, ...'

107) a. * La seule personne que ça l'ennuierait qu'elles pensent être de son côté, ...
b. * L'unica persona che lo danneggerà che pensino essere dalla sua parte, ...
'The only person who it will harm him that they think t to be on his side, ...'

108) a. * La seule personne que nous avons été recompensés pour avoir cru être intelligente, ...
b. * L'unica persona che siamo stati ricompensati per aver ritenuto essere intelligente, ...
'The only person who we have been rewarded for considering t to be intelligent, ...'

The ungrammaticality of these sentences is quite strong, comparable to an ECP violation.[33]

If the Rizzi/Kayne analysis of the grammatical sentences in (99) is correct, then there is an intermediate trace in the

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i) * Gianni, che mi domando che cosa ritieni aver fatto, comunque non merita una simile punizione.
'G., that I wonder what you believe t to have done, anyway doesn't deserve such a punishment.'

33. This is apparently not the case for some French speakers, who, nevertheless, find extraction of subjects from complements of these verbs noticeably worse than extraction of objects. If the phenomenon should not be classed as an ECP violation, then an analysis such as Pollock's (1985), which does not require a trace in the SPEC of the embedded CP, would group the croire/ritenére facts with subject extraction in English. The analysis of the que/qui alternation and extraction of direct objects in Dutch discussed later in this section are still valid whatever the correct approach to the croire/ritenére facts.

SPEC of the embedded CP, as shown in (100), which is crucial to the well-formedness of the structure at LF. I adopt the suggestion of J. Aoun, discussed in KoL, that an NP (i.e. an NP chain) must be case-marked in order to be visible for θ-marking. Moreover, I interpret the Visibility Condition as requiring that means of case-marking an NP must be extant at LF when the θ-criterion is checked. By this interpretation, case-marking is not like τ-marking: the configuration of case-marking may not be satisfied once during a derivation and then destroyed by Affect α. Therefore, the intermediate trace in the SPEC of CP in (100) must be present at LF.

Other than the constraint on case-marking configurations just proposed, only the ECP is relevant to determining the status of t′ in (100) at LF. Let's examine the structure of a sentence like those in (106) in a bit more detail to see if the ECP will correctly rule out (106) - (108). (V~ = a verb from the croire/ritenére class.)

109) $[_{CP_c}$ wh_i ... $[_{VP_{c'}}$ t_i^4 $[_{VP_c}$ V $[_{CP_b}$ wh_j ... $[_{VP_{b'}}$ t_i^3 $[_{VP_b}$ V~ $[_{CP_a}$ t_i^2 $[_{IP_a}$ t_i^1 ...

The empty categories which are required to be present for independent reasons are t_i^1 (by the θ-Criterion and the Projection Principle) and t_i^2 (by the Visibility Principle and indirectly by the θ-Criterion). Recall that Chomsky's (1986, class lectures) version of τ-marking assumes the following: τ-marking of traces is freely ordered wrt Affect α, both at SS and LF; the entire A′-chain of an adjunct (including all

intermediate traces) must be present throughout the derivation; ECP is checked at the end of the LF derivation. At some point before the ECP is checked the intermediate trace t_i^2 will τ-mark t_i^1. Similarly, the VP_b-adjoined trace, t_i^3, will τ-mark t_i^2. The remaining intermediate traces may delete at any point in those two mappings so long as t_i^3 does not delete before it τ-marks t_i^2. By the time the ECP is checked at the end of the LF mapping, there are no [-τ] traces in the representation. The sentence is incorrectly predicted to be grammatical by this approach to proper government and τ-marking.

The L&S approach to τ-marking fares much better. Recall that L&S argue that both τ-marking and Affect α apply in the mappings from DS to SS and from SS to LF, but that τ-marking is always ordered after Affect α in a mapping. The ECP is checked after LF τ-marking. L&S must also adopt the principle in (110), their "principle (109)".

110) Only an argument receives a τ-feature at SS.

Since t_i^2 is not an argument, it will not receive a τ-feature at SS. Crucially, it will not be marked [-τ], since they also must assume that a τ-marked trace cannot be re-τ-marked at a subsequent level. In order for t_i^2 to receive [+τ] at LF the next intermediate trace, t_i^3, must also be present at LF. But recall that Affect α precedes τ-marking at each level; this means that t_i^3 will not be able to τ-mark t_i^2 and then delete. Therefore, t_i^3 must also be τ-marked at LF. In fact, for the sentence to be licensed the entire chain must be present at

LF, i.e. all empty categories must satisfy the ECP by being marked [+τ]. However, t_i^4 does not properly govern t_i^3 because of the intervening wh-island. Therefore, the L&S approach to τ-marking correctly predicts that a sentence with the structure in (109) will be an ECP violation.

There is a modification of Chomsky's approach which captures the generalization suggested by the data in (106) - (108), namely, that subjects of the complements of the croire/ ritenére class of verbs behave like adjuncts wrt the ECP. The modification involves extending the stipulation on adjunct chains to all chains incorporating A'-empty categories, as shown in (111).

111) Any A'-chain containing a non-pronominal empty category in an A'-position at LF must be entirely represented throughout the derivation.

(111) has the same effect as the principle in (110) plus the ordering of Affect α and τ-marking in the L&S approach.

The que/qui alternation in French is also dependent on the presence of a trace in the SPEC of CP, according to the analysis of Pesetsky (1978).[34] In French an ECP violation is avoided in (112a) by virtue of the qui complementizer, which, according to Pesetsky, may take on the index of the trace in the adjacent SPEC. He also argues that a similar process is responsible for the grammaticality of (112b).

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34. See also Kayne (1984). Pesetsky's analysis transfers straightforwardly to the CP/IP approach to sentence structure.

112) a. la femme$_i$ que je crois qui$_i$ t$_i$ aime Jean
b. the woman$_i$ that$_i$ t$_i$ likes John
c. * Who$_i$ do you think that t$_i$ likes John?

English differs from French in that complementizer indexing occurs only with relative clause (and cleft) complementizers; thus, (112c) is ruled out by the ECP.

If the trace which triggers the que/qui alternation must be present at LF, then we would expect that the A′-chain formed by subject extraction would have the status of an adjunct A′-chain for τ-marking. The prediction of (111) is that embedding a complement clause of the form in (112a) within a wh-island will result in strong ungrammaticality. As shown in (113), the prediction is borne out. ((113b,c,d)=C87)

113) a. * la femme que je ne sais pas qui croit qui aime Jean
'the woman that I don't know who believes (qui) likes John
b. * Qui vous demandiez-vous comment elles croyaient qui était mort?
'Who were you wondering how they could believe had died?'
c. * Qui t'ennuierait qu'elle pense qui est mort?
'Who would it harm you that she thinks has died?'
d. * Qui regrett-t-il que nous croyons qui n'était pas amical?
'Who does he regret that we believed wasn't friendly?'

In every case in (113) there is an A′-trace which is blocked from receiving [+τ] by the intervention of a barrier. The ECP correctly rules out the que/qui alternation within islands.

The analysis of parasitic gap constructions proposed in chapter three in combination with this analysis of the croire/ ritenére and que/qui facts predicts that neither of these two

will occur within the parasitic domain. That is, a parasitic gap will be ungrammatical as the subject of a croire/ritenére infinitival complement and will not license the que/qui alternation; the result in both cases will be a strong violation. Both predictions are true. ((114)=C86)

114) a. * L'homme$_i$ que nous apprécions t_i sans croire e_i être intelligent
b. * L'uomo$_i$ che apprezzàvamo t_i pur senza ritenere e_i essere intelligente
'the man that we appreciated t without believing e to be intelligent'

115)* La femme que Jean voulait rencontrer sans croire qui l'aime

I have argued that the A'-pro in parasitic gap constructions must delete in the mapping from SS to LF by the principle of Full Interpretation, giving an LF representation with the intermediate traces shown in (116) for sentences such as those in (114). (Ø marks the location of deleted A'-pro.)

116) ...wh$_i$...[$_{VP}$ t_i' [$_{VP}$ [$_{VP}$...t_i...] [$_{PP}$...[$_{CP}$ Ø [$_{IP}$... [$_{VP}$ e_i'' [$_{VP}$...[$_{CP}$ e_i' [$_{IP}$ e_i...]]]]]

According to the analysis I proposed above, it is necessary for e_i' to remain in the representation at LF. Whether we adopt the L&S approach to τ-marking or one incorporating (111), the representation will be ruled out as e_i'' will not be marked [+τ].

An objection that could be raised against this analysis concerns the requirement that A'-pro not appear in the LF representation of parasitic gap constructions. I have argued

that this pro is "licensed" at SS as an intermediate member of an A′-chain. However, it is not licensed as a null pronominal: it never receives phi-features (or has its phi-features licensed) by participating in an agreement relation. The ungrammaticality of (114) and (115) indicate that being an intermediate member of an A′-chain is not sufficient to license an empty pronominal in an A′-position at LF. A′-pro may be licensed functionally at SS but it must be licensed in content (i.e. phi-features) in order to escape the filtering effects of the principle of Full Interpretation at LF.

An analysis similar to that proposed for the <u>que/qui</u> alternation and the <u>croire/ritenére</u> facts may also account for the behavior of direct objects (DOs) in Dutch. Koopman & Sportiche (1986b; hereafter, K&Sb) point out that extraction of DOs in Dutch, (117a), is strongly blocked by islands, as is extraction of adjuncts and subjects, (117b,c), while extraction of argurent PPs over islands, (117d), is possible. (All examples are from K&Sb.)

117) a. * Wie$_i$ hij zich afvroeg of jij t$_i$ aardig vond?
who$_i$ he wondered whether you t$_i$ liked
'Who$_i$ did he wonder whether you liked t$_i$?'

b. * Wie$_i$ hij zich afvroeg of t$_i$ jouw aardig vond?
who$_i$ he wondered whether t$_i$ you liked
'Who$_i$ did he wonder whether t$_i$ liked you?'

c. * Waarom$_i$ hij zich afvroeg of Jan t$_i$ ontslagen was?
why$_i$ he wondered whether Jan t$_i$ fired was
'Why did he wonder whether Jan had been fired?'

d. Met wie$_i$ hij zich afvroeg of hij t$_i$ zou kunnen praten?
with whom$_i$ he wondered whether he t$_i$ would be able to talk
'With whom$_i$ did he wonder whether he would be able to talk t$_i$?'

K&Sb argue that, in this context, DOs pattern with adjuncts in Dutch because the normal SS position for a DO is an A′-position: for reasons having to do with Case, a DO must move from its DS θ-position to a VP-adjoined position. This is move (a) in (118), which is essentially K&Sb's (27).

118) * $[_{CP2}$ wh_i ... $[_{CP1}$ +wh ... $[_{VP}$ t_i [t_i V]]]]]]

(b) (a)

It is from this adjoined position that wh-movement originates, shown in (118) as move (b). They then argue that long movement, i.e. non-successive cyclic movement, is possible only from θ-positions and is, therefore, not an option for DOs.

That Dutch DOs are in an A′-position at SS is further supported by their ability to license parasitic gaps without being wh-moved. This is discussed in Bennis & Hoekstra (1985; hereafter, B&H), where the following examples are given.

119) a. Jan heeft die boeken$_i$ [zonder e_i te bekijken] weggelegd.
John has those books [without to inspect] away put

b. Ik heb deze scriptie$_i$ [alvorens definitief e_i te beoordelen] eerst aan Jan voorgelegd.
I have this term paper [before definitively to judge] first to show John

If this analysis of DOs in Dutch is correct, it means that when a DO is wh-moved, there must be an intermediate A′-trace in VP-adjoined position for case purposes, just as is the case when the subject of an infinitival complement of a verb from the croire/ritenére class is wh-moved. DOs in Dutch straight-

forwardly come under the analysis proposed above for the subjects of infinitival complements of croire/ritenére verbs.

There is a problem with this, however: according to B&H the DO is in an A'-position only when the word order is ...DO Adjunct V..., not when it is ...Adjunct DO V.... If this means that the DO is free to remain in its DS position at SS, then neither the K&Sb analysis nor my recasting of it in terms of the croire/ritenére analysis is motivated.

Koopman & Sportiche (1986a) discuss some facts about wh-movement in Vata which might also be brought under the analysis I have proposed. Wh-movement in Vata has the following characteristics: extraction of argument PPs and direct objects from within wh-islands (long-extraction") is possible; short wh-movement of subjects, adjuncts and verbs obligatorily leaves behind a resumptive pronoun; long-extraction does not apply to subjects, adjuncts and verbs. K&Sa argue that the resumptive pronoun strategy is necessary because a wh-moved element, even in the case of "short" movement, goes to a position from which an antecedent may not properly govern its trace. Therefore, the ECP cannot be claimed to rule out long extraction of subjects, adjuncts and verbs as they do not leave behind empty category traces. To account for these facts, K&Sa propose a Condition on Long Extraction:

120) x is a possible long extraction site iff x is a θ-position.

They further argue that the subject position (in Vata at least, perhaps more generally) is a θ′-position, the subject being base-generated within the VP and raised to its SS position. There are several ways this range of facts could be accounted for by the proposals in this section; however, assessing how well the analysis accounts for the data or what kind of ramifications the Vata facts have for the analysis requires more subtle comparative judgements of the violations in question than I have access to. Therefore, the assessment of my analysis vis-a-vis Vata wh-movement cannot be undertaken at this time.

4.4.6 Overt/Finite vs. Null/Infinitival

In §4.4.1 I began by dividing the OWM constructions into two groups. The members of the first group, infinitival relative clauses, tough-constructions, purpose clauses, and degree clauses, occur only with infinitival clauses, never appear with overt wh-operators and exhibit the subject/object asymmetry discussed at length above. The second group is made up of tensed relative clauses, clefts and comparatives, which appear obligatorily with tensed clauses, optionally with overt wh-operators, and which seem to be less deviant with embedded subject gaps than the infinitival group, though the effect is still noticeable in certain contexts. Optimally, we would hope to find a unified explanation for the distribution of these properties. I do not have such an analysis, but I do have a

few things to say about the problem which may shed some light on directions for further research.

First, I will attempt to separate out the various aspects of the subject gap problem. I suggested above that most of the verbs which allow embedded subject gaps are incompatible with a purposive interpretation. This is most apparent, naturally, in purpose clauses. If there were reason to believe that the infinitival OWM constructions share a kind of inherent purposive aspect to their semantics which the tensed OWM constructions do not, then the subject gap contrast would be virtually explained. Analysing the semantics of the OWM constructions in question is beyond the scope of this work, but there are reasons to believe the purposive connection to be the key to the subject gap problem.

There is evidence that the infinitival clauses in the constructions of the infinitival group derive diachronically from dative nominals and PPs.[35] In OE the infinitive appears as a nominal, complete with case-endings. As such, the infinitive was able to appear as the object of certain prepositions, e.g. the purposive <u>to</u> and <u>for</u>. During the transition to ME, when the language lost most of its affixal case-indicators, a wide variety of prepositions were coopted into use as case-markers; see Lumsden (in progress) for arguments that these prepositional case-markers do not head full PPs. Over time,

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35. This brief discussion owes much to J. Lumsden, who should not be held accountable for the uses to which I put some of the insights and arguments found in Lumsden (in progress).

these prepositional case-markers were reanalysed as infinitival INFL and COMP, respectively, a process which corresponded to the reanalysis of infinitival phrases (even some of those originally analysed as nominal objects of PPs) as clausal entities rather than nominals.

The point I wish to make here is that the clausal complements of the infinitival group of OWM constructions are plausibly derived from PPs with nominal objects. In fact, three of the infinitival OWM constructions, relatives, purpose clauses and degree clauses, still have purposive PP counterparts of the infinitival forms.

121) a. a topic to discuss calmly
b. a topic for calm discussion

122) a. I bought John a tent to take camping in the Rockies
b. I bought John a tent for camping trips in the Rockies

123) a. This topic is too difficult to research any further.
b. This topic is too difficult for further research.

Taking the sharp ungrammaticality of purpose clauses with epistemic verbs as evidence that there is a "purposive-epistemic clash" (which naturally requires an explanation), it should not be surprising that the constructions in (121a), (122a) and (123a) do not easily host epistemic verbs.

In the remaining member of the infinitival group, the tough-construction, the clause does not seem to correspond so neatly to a purposive PP, as shown by the ungrammaticality of (124b).

124) a. This topic is difficult to discuss calmly.
b. * This topic is difficult for calm discussion.

In this case the difficulty surely arises from the nature of the tough-adjective as a clausal or propositional modifier, although I have no concrete proposals for ruling out (124b).

The tensed OWM constructions do not have counterparts involving purposive PPs and do not seem to have any sort of purposive aspect to their interpretation. Nor do any of them involve heads (adjectival, adverbial or otherwise) which indirectly exert some kind of selectional constraints on the "topmost" verb in the embedded clause. Without the interference of the "purposive clash", complements with embedded subjects will naturally be more acceptable.

The above discussion is no more than a rough sketch of a possible line of argument, but let us assume that the subject gap issue is resolved in the manner suggested. This leaves us with the following phenomenon to explain: tensed clauses may appear with either overt or null operators and infinitival clauses appear only with null operators. This correspondence was noted in Levin (1983, 1984) where the distribution of null and overt operators was argued to be crucially linked to the finiteness of the clause within which they occur. Levin (1983) proposes the Case Visibility Principle (CVP):

125) Case is only visible under government.

Overt operators, like overt NPs in A-positions, must have Case. A verb may govern the COMP of a clausal argument, licensing an overt operator, or INFL, which is base-generated in COMP, may govern an operator in COMP and satisfy the CVP if it is finite. In Levin (1984) these proposals are incorporated into a revised version of Brody's (1983) theory of empty categories, chains and case-relations. I will not rehearse the details of Brody's theory or Levin's proposed revision, but will simply summarize the relevant consequences and refer the reader to Levin (1984) and Brody (1984) for discussion.

The crucial result of the Brody/Levin analysis for the problem at hand is that overt operators must be governed and null heads of chains (PRO and null operators) must be ungoverned; the latter condition being derived from case theory rather than binding theory. This, along with the assumption about INFL in COMP noted above, accounts neatly for the distribution of overt and null operators in the data in (126) - (127). (The examples below follow the paradigms in Levin (1983) and the judgements given are hers.)

126) a. I know who Jane likes t
b. I know who to visit t
c. I know with whom to speak t
d. I know who to talk to t
e. * I know to talk to e
f. * I know to visit e
g. * I know with e to speak t
h. * I know Jane likes e

127) a. I know the person who Jane likes t
b. * I know the person who to visit t
c. I know the man with whom to speak t
d. * I know the man who to talk to t
e. I know the man to talk to e

f. I know the man to visit e
g. * I know the man with e to speak t
h. * I know the man Jane likes[36]

As can easily be verified, under the above assumptions (126e,f,g,h) and (127b,d,g,h) are ruled out and the rest are predicted to be grammatical. This approach, embedded in a general theory of empty category distribution, is quite attractive as an explanation for the overt/tensed vs. null/infinitival dichotomy within OWM constructions.

There are some problems with adopting this analysis, however. For one thing, this approach requires an analysis of tough-constructions which treats the infinitive as an adjunct rather than as a complement of the adjective; if the structure is as in (128) the adjective will govern the null operator and the sentence will be incorrectly ruled out.

128) ...[$_{IP}$ John is [$_{AP}$ easy [$_{CP}$ Op [$_{IP}$ PRO to please e]]]]...

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36. Levin assumes that complementizer deletion is responsible for forming the grammatical version of (127h) but that complementizer deletion is a PF phenomenon. Therefore, she argues that there will be no SS configuration in which a null operator occurs in the COMP of a tensed sentence. I have assumed that null operators are involved in the derivation of relative clauses without overt operators regardless of the presence or absence of the complementizer. Thus, from my perspective, a representation such as (i) must be allowed as a viable SS representation. (e = a null complementizer)

i) ...[$_{NP}$ the man [$_{CP}$ Op$_i$ that/e [Jane likes e]]]...

Such a representation is ruled out by the CVP/Case-linking theory.

Secondly, it is predicted that pied-piping of overt wh-operators will always be licensed in infinitivals when, in fact, it is only possible to have PP pied-piping in infinitival relatives and infinitival questions. Compare (126c) and (127c) with (129).

129) a. * John is easy to whom to speak.
b. * John is too angry to whom to speak.
c. * I gave it to Mary with which to play.

Finally, the problem with Levin's analysis of (127h) noted in fn. 12, which also arises with clefts and comparatives, seems to me to be a significant one. While the Brody/Levin theory is the only promising account of the overt/tensed vs. null/infinitival dichotomy around, there remain important problems to be resolved.

4.5 Calculating Barriers

4.5.1 Introduction

The main goal of §4.4 was to account for a subtle, yet systematic, contrast between A′-movement of subjects and A′-movement of objects, a contrast which mimics ECP effects in some respects but which does not seem to result in full-blown ECP violations. I proposed to account for this contrast by relativizing the Subjacency Condition so that the bounding constraints placed on non-complements is stricter than that placed on complements. As I noted in §4.4.4 the evidence presented to motivate this revision involves only contrasts

subjects and objects. The complement/non-complement formulation is more general than the subject/object formulation of the same condition in two ways: it suggests that movement of adjuncts will be subject to the same bounding conditions as movement of subjects and it suggests that movement of complements other than direct objects (e.g. argument PPs) will be subject to the weaker bounding condition. Is this greater generality warranted?

It is difficult to judge the nature of the bounding conditions (if any) which apply to adjunct movement because the effects of a Subjacency Condition violation will be obscured by the ECP violation which, for adjuncts, results from the crossing of even one barrier. On the other hand, extending the weaker bounding restriction to complements other than direct objects seems well-motivated in at least one case: Koopman & Sportiche (1986b) point out that wh-islands are not absolute islands for movement of argument PPs in Dutch. Other facts concerning extraction of argument PPs from PP adjuncts and complex NPs suggest that PPs should be subject to rather strict bounding conditions. These issues will be discussed in §4.5.3 where I will argue that the Subjacency Condition should be maintained in the form given in (96), a form which imposes the same constraints on argument PPs as on direct objects.

The second proposal made in §4.4 concerned the nature of the ECP asymmetry. I argued that any chain with an empty category in a non-argument position at LF should be subject to the ECP-related constraints placed on adjunct A′-chains, whether

these constraints are formulated in the manner of L&S or in the manner of Chomsky (1986, class lectures) as revised to include (111).

The system as developed so far expresses a more articulated range of grammaticality than the Barriers system on which it is based. At SS, crossing one barrier yields a mild violation for a complement and a stronger one for a subject (or adjunct). (The violation is mitigated if the barrier crossed is the "weak" barrier of a tensed IP/CP.) Crossing two barriers yields a strong violation for a complement.[37] At LF, subject and adjunct ECP violations result in the strongest ungrammaticality. Nevertheless, a great deal of indeterminacy remains within the system; this section and the next will be devoted to examining some problems for this approach to bounding effects. In §4.5.2 I will discuss some issues related to the Subjacency Condition and the calculation of Subjacency Condition violations, in particular, the weak barrierhood of tensed IP/CP and the cumulative effect of crossing non-adjacent barriers. §4.5.3 will be devoted to examining the extraction of argument PPs from within NPs, PPs and other islands.

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37. The violations produced by crossing one barrier in the case of subject extraction and two barriers in the case of object extraction should be equivalent, though this true only in some cases.

4.5.2 Weak and Non-adjacent Barriers

The definitions of L-barrier, BC, and L-mark which I adopted in chapter one are repeated below.

130) (Where τ is a maximal projection,) τ is a **barrier** for ß iff (a) or (b):
a. τ immediately dominates δ, δ a BC for ß;
b. τ is a BC for ß, τ ≠ IP

131) τ is a BC for ß iff τ is not L-marked and τ includes ß.

132) τ **L-marks** ß iff ß is the complement of τ.

These are essentially the definitions found in Barriers with some modifications based on Chomsky (1986, class lectures).[38]

The definition of "barrier" in (130) treats IP as exceptional; it is not L-marked, yet it is never automatically a barrier. IP may only inherit barrierhood from another BC or induce barrierhood in CP. Treating IP as an exceptional category in this respect is well-motivated since otherwise every instance of short wh-movement would be at least a one barrier violation. However, it has often been observed that tensed IP is active, though not always in very clear ways, in inducing

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38. I have not adopted a version of L-marking which allows the SPEC of an L-marked category to be L-marked. (i) has this property and is modeled on the Barriers revised definition (p. 24).

i) (...) α L-marks ß iff ß agrees with the head of τ that is the complement of α.

While this definition correctly allows wh-extraction from the SPEC of CP (E. Torrego's sentences), it incorrectly predicts that extraction from ECM and small clause subjects and extraction from within the SPEC of an L-marked NP will all be possible. I have no solution to this problem.

island violations. Rizzi (1982) pointed out that in Italian if CP~ is tensed in the configuration in (133) a wh-island violation results, while if it is infinitival no violation results. Examples (from Rizzi (1982) are given in (134).

133) $[_{CP}$ wh_i $[_{IP}...[_{CP'}$ wh_j $[_{IP}...[_{CP}...t_i...$

134) a. * Mario, che non immagino perché tu abbia deciso che non incontrerai, è una brava persona.
'M., that I do not imagine why you have decided that you will not meet, is a nice fellow.'

b. Mario, che non immagino perché tu abbia deciso di non incontrare, è una brava persona.
'M., that I do not imagine why you have decided not to meet, is a nice fellow.'

The judgements are as given in publication, but L. Rizzi suggests (p.c.) that they be interpreted as contrastive rather than absolute. The comparable English sentences in (135) show the same contrast.

135) a. ?? John, who I can't imagine why you've decided that you won't visit t, ...

b. ?? John, who I can't imagine why you've decided not to visit t, ...

In Barriers only the most deeply embedded tensed clause is regarded as inducing weak bounding effects, the motivation for this position being that (136) is well-formed.

136) Who do you think that Bill said that Mary visited t

If tensed IP were always a weak barrier, then (136) should be noticeably deviant, under the assumption that the degree of ungrammaticality exhibited by a sentence increases cumulatively when non-adjacent barriers are crossed. (However, even

limiting the weak barrierhood of tensed IP to the most embedded clause incorrectly predicts that (136) will be somewhat marginal.)

If only the most deeply embedded tensed clause is a weak barrier then the tensedness of CP′ in (134a) should be irrelevant. The sentences in (137) are of the form in (134a); in both (137a,b) the most deeply embedded clause is tensed and the intermediate clause has a wh-filled SPEC. (137a,b) differ only with respect to the tensedness of the intermediate clause.

137) a. which problem$_i$ did you figure out who to persuade that you couldn't solve t$_i$
b. which problem$_i$ did you figure out who Bill persuaded that you couldn't solve t$_i$

Contrary to the prediction, (137b) seems marginally worse than (137a), suggesting that the tensedness of clauses other than the most deeply embedded is a factor in the acceptability of a sentence. Another question to be asked is whether crossing a tensed IP and a CP with a wh-filled SPEC (which I will refer to as a wh-CP) yields the same degree of deviance when the wh-CP does not immediately dominate the tensed IP.[39] Extraction of which problem in (137a) crosses a tensed IP and a wh-CP, as does object extraction in (134b) and in (138).

138) a. which problem$_i$ did you decide to ask how Bill had solved t

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39. Assume for this discussion that "immediately dominates" holds between maximal projections, i.e. intervening X′ levels are irrelevant.

b. which problem$_i$ did you wonder how Bill had tried to solve t$_i$

(137a) and the sentences in (138) sound about the same to me, which leads to the conclusion that crossing a tensed IP and a wh-CP induces the same degree of ungrammaticality whether they are adjacent or not. This is not the case with other combinations of barriers. For example, crossing two barriers in (139a) results in a strong (CED) violation; the two barriers crossed are NP and IP.

139) a. *' Who do you think that stories about annoy Mary?
b. Which problem did you know who to ask how to solve?

However, crossing two wh-CP barriers which are non-adjacent, as in (139b), results in an extremely mild violation. The ungrammaticality of (140) indicates that, even when infinitival, wh-CPs create a one-barrier break in a chain.

140) * How$_i$ do you know [what$_j$ to fix t$_j$ t$_i$]

Therefore, we cannot explain the relative well-formedness of (139b) by claiming that infinitival wh-islands do not form barriers. The conclusion which I will (tentatively) draw from this brief discussion is that a sentence in which a chain is broken by two adjacent barriers, as shown in (141a),

141) a. $\alpha_1 \ldots \alpha_2 \ldots [_{B_1}\ [_{B_2} \ldots \alpha_3 \ldots$
b. $\alpha_1 \ldots [_{B_1} \ldots \alpha_2 \ldots [_{B_2} \ldots \alpha_3 \ldots$

will exhibit a stronger degree of ungrammaticality than a sentence in which a chain is broken by two non-adjacent barriers, as shown in (141b).

Some additional remarks on the weak barrierhood of tensed IPs: whatever the status of the tensed IP barrier, it must be relevant only for the Subjacency Condition or even simple adjunct extraction, as in (142a), will be ruled out along with more complex examples such as (142b).

142) a. How did John fix the car?
b. How do you think that John fixed the car?

This suggests that the weak barrierhood of tensed IP is of an altogether different character than the barrierhood of a wh-CP or adjunct.

Longobardi (p.c.) has argued that parasitic gap constructions with embedded islands do not exhibit a degree of ungrammaticality equal to the sum of an Adjunct Condition violation and a wh-island violation, i.e. (143a) is not as ungrammatical as (143b) + (143c).

143) a. the appliance which did you bought t without finding out how to use e
b. the appliance which you found out how to use t
c. the appliance which you left the store without buying t

I am not sure that I agree with this assessment of the relative grammaticality of these three sentences. It is true that (143a) is somewhat more acceptable than (144).

144) the applicance which you left the store without finding out how to use t

The analysis of parasitic gaps constructions in chapter three predicts that this should be the case, however, given that direct extraction from within PPs crosses two barriers while the complex chain in a parasitic gap construction is broken by only one barrier. (See §3.2.2 for discussion.)

There are three possible structural relations between a wh-island and parasitic domain: (a) the wh-island contains the parasitic domain, (b) the parasitic domain contains the wh-island, (c) neither contains the other. The three possibilities are illustrated in (145).

145) a. $[_{CP}\ wh_i \ldots [_{CP}\ wh_j \ldots t_i \ldots [_{PP} \ldots pro_i \ldots e_i \ldots]]]$
b. $[_{CP}\ wh_i \ldots t_i \ldots [_{PP} \ldots pro_i \ldots [_{CP}\ wh_j \ldots e_i \ldots]]]$
c. $[_{CP}\ wh_i \ldots [_{CP}\ wh_j \ldots t_i \ldots] \ldots [_{PP} \ldots pro_i \ldots e_i \ldots]]$

The real question regarding bounding effects in parasitic gap constructions is whether the three configurations in (145) result in different degrees of deviance. If the configuration in (145b) consistently yields constructions which are more grammatical than constructions corresponding to (145a) and (145c), then there is reason to maintain the hypothesis that the parasitic domain of a parasitic gap construction is not sensitive to wh-islands. Some examples of the configurations in (145) are given in (146) - (148).

146) a. the vegetable that you found out how to prepare t without overcooking e
b. the vegetable that you bought t without finding out how to cook e properly

c. the vegetable that you realized you didn't know how to cook t after buying e on a whim

147) a. a car that John didn't know whether he could fix t without damaging e
b. a car that John bought t without knowing whether he could fix e
c. a car that John knew whether he could fix t without even examining e

148) a. the paper that you were wondering who translated t without proofreading e
b. the paper that you read t without guessing who had written t
c. the paper that you found out who had written t only after reviewing e

The wh-phrase which forms the islands in (146) is the adjunct how, in (147) it is the complementizer whether and in (148) it is the subject who. In addition, the wh-CPs in (147) and (148) are tensed. Taking these potentially complicating factors into account, I find no systematic improvement when the wh-island is embedded in the parasitic domain, i.e. the (b) examples are not uniformly more grammatical than the (a) and (c) examples.

A final comment on the cumulative effect of non-adjacent barriers: in chapter three I analyse the sentence in (149a) as involving a single complex chain of the form in (149b) or (149c).

149) a. a man who close friends of e^1 admire t without respecting e^2
b. $(who, t, pro^1, e^1, pro^2, e^2)$
c. $(who, t, pro^2, e^2, pro^1, e^1)$

The two pros in (149b) are the A'-pros of parasitic gap constructions; see chapter three for discussion. The complex chain in (149) is broken in two places by single barriers: in

(149b) the link (t,pro^1) is divided by an NP barrier and the link (e^1,pro^2) is divided by a PP barrier. In (149c) the link (t,pro^2) is divided by a PP barrier and the link (e^2,pro^1) is divided by an NP barrier. (149a) should therefore be a stronger Subjacency Condition violation than either of the sentences in (150).

150) a. the man that close friends of e admire t
b. the man that you admire t without respecting e

While (149a) is less acceptable than the sentences in (150) it is difficult to judge whether the decreased acceptability should be attributed to a more severe violation of the Subjacency Condition. (149a) is also more complex than either (150a) or (150b) as its complex chain has one more "tail" than either of the complex chains in (150). At this point I draw no conclusions from these data, but regard them and the points brought up in this section as evidence that the reformulation of the Subjacency Condition which I have proposed does not account for all the factors affecting the acceptability of constructions involving multiple and complex A′-chains. Further research may allow a systematic account of both the tensedness effect and the cumulative effects of crossing non-adjacent barriers.

4.5.3 PPs and Extraction

In a preposition stranding language such as English, extraction of the NP objects of prepositions from within sub-

categorized PPs[40] does not incur violations either of the ECP or of the Subjacency Condition.

151) a. Who did you speak to t
b. Who can you depend on t

152) a. Who did you give the paper to t
b. Who did you steal the money from t
c. Who did you buy a present for t
d. What did you leave the book on/under/in t
e. What did you put the cake on/in t

Leaving aside the question of whether these PPs are base-generated as sister to V or V′, I will assume that they are within VP, rather than in an adjoined position, as seems reasonable for arguments of V. The sentences in (151) and (152) will then share the portion of structure in (153).

153) ... [$_{VP}$ t′ [$_{VP}$ ... V ... [$_{PP}$ P t]] ...

The system must allow t′ to antecedent govern t, that is, there must be no government barriers between t′ and t. Furthermore, there must be no subjacency barriers between t′ and t since (151) and (152) are not even mild Subjacency Condition violations. The PPs in question are L-marked since they are arguments of a lexical head. Thus, no Subjacency Condition violation will be incurred nor will t′ be prevented from antecedent governing t by the presence of a barrier created by a failure of L-marking (L-barrier). However, by the definition of M(inimality)-barrier given in Barriers, (154a), and that

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40. "Subcategorized" may be too strong a descriptor here, since instrumentals and some locatives allow grammatical extractions as well.

given by Chomsky (1986, class lectures), (154b), PP is an M-barrier in (153) (and therefore in (151) and (152)), blocking government of t by t′.

154) a. Given the structure ...α...[$_{\tau}$...δ...β...], τ is an M-barrier for β (wrt α, a category excluded by τ) if τ is the immediate projection of δ, a zero-level category distinct from β.

b. α is an M-barrier for β if α includes β, δ (an X° c-commander of β), and τ (a maximal projection not necessarily distinct from α).

With either definition, the system predicts that the sentences in (151) and (152) should be strongly ungrammatical.

An obvious solution within the Barriers framework is to allow "transient" adjunction[41] to PP, a move proposed by Chomsky for other reasons in his discussion of parasitic gaps. This gives the structure in (155) as an alternative to (153).

155) ... [$_{VP}$ t [$_{VP}$ ... V ... [$_{PP}$ t′ [$_{PP}$ P t]]] ...

In (155) the category PP is not an M-barrier for t under either definition in (154).[42] If the definition of M-barrier is as in (154a), there must be no P′ level of projection. In Barriers it is suggested that intermediate levels of projec-

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41. By transient adjunction I mean any sequence of two applications of move α which result in the following schema (where α is the element moved from the position of t):

i) ...α...[$_{XP}$ t′ [$_{XP}$ ...t...]...
↑_____↑_____|
2 1

42. The segment PP cannot be an M-barrier under either definition in (154) without eliminating the significance of the definition of government based on exclusion.

tion may be omitted when they are not structurally necessary; see §1 and §8 for discussion. Accordingly, as there is no overt SPEC of PP in these constructions, we may assume there is no P′ level. This proviso is not necessary with definition (154b) since there is no τ, necessarily a maximal projection, in an adjunction structure such as (155), as illustrated schematically in (156).

156) ... $[_{X''}$ t′ $[_{X''}$ ... $[_{X'}$ X t] ...
(τ??) α? δ β

By allowing transient adjunction to PP, the ECP problem (i.e. the failure of (151) and (152) to exhibit ECP-type violations) is resolved, whether we choose the (154a) or (154b) version of M-barrier.

However, this solution to the ECP problem leaves us with no explanation for the ungrammaticality of the sentences in (157). (Judgements vary among speakers and there are slight differences depending on the preposition chosen, but the speakers consulted consistently rated sentences such as these ? or ??.)

157) a. Which concert did you fall asleep during t
b. Which performance did you get sick before/after t
c. Which bridge did you park the car near t
d. What did you leave home without t
e. What did you buy tuna instead of t

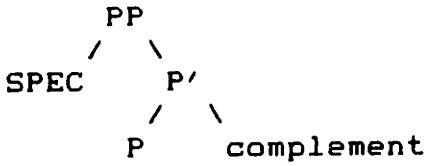
These PPs are presumably not L-marked and therefore should be barriers both to government and movement. The relatively mild ungrammaticality exhibited by the sentences in (157) indicates

that, once again, it is necessary to rule out the possibility of an ECP violation. However, if this is accomplished by allowing adjunction to PP in these cases as well, no subjacency violation should result. The same is true for non-argument NPs, as shown below.

158) a. I will arrive [the first week of November]
b. ?? Which month will you arrive [the first week of t]

An obvious solution is to allow PPs the full internal structure licensed by X′-theory, as shown below, including a SPEC which acts as an escape hatch for wh-movement.

159)



This is essentially van Riemsdijk's (1978) proposal, though the structure in (159) is a great deal less articulated than that which he motivates. If there is no transient adjunction to PP then the Subjacency Condition violation of (157) is explained.

This solution to the problem of extraction from PPs leaves us with the problem of explaining why transient adjunction to PP should be prohibited and whether this is a general constraint, i.e. does transient adjunction exist at all? If so, is there a principled way to characterize the categories which may be adjoined to? These questions are particularly important within the Barriers approach to movement since

adjunction to VP is a crucial means of limiting the effects of both L-barriers and M-barriers. N. Chomsky suggests (p.c.) that adjunction be allowed only to those categories which are neither arguments nor predicates.[43] This would permit adjunction only to IP and sisters of I (e.g. VP and AP in sentences such as "John is intelligent").

Given the structure of PP in (159), and assuming a structure for NP which allows for an NP internal landing site, adjunction to VP is the only instance of transient adjunction which is still crucial to prevent both Subjacency Condition and ECP violations. In §4.6.4 I will adopt a revision of Rizzi's (1986, class lectures) relativized minimality condition which does not allow heads to block antecedent government of an XP trace by an XP. Therefore, the minimality motivation for adjunction to VP is eliminated. By the definitions in (130) - (132), however, VP will always be a BC and barrier, so adjunction is still required. For the moment, I will continue to assume VP-adjunction.

It is well-known that parasitic gaps cannot be PPs, as shown by (160).

160) a. *? a man to whom we sent a letter t after giving some money e[44]

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43. Perhaps by extending K. Johnson's θ-based argument against adjunction to arguments.

44. Longobardi (forthcoming) notes that Italian sentences comparable to (160a) are accepted by many speakers; I find (160a) far more acceptable than (160b) in English as well. Longobardi hypothesizes that it is the (semi-)optionality of dative arguments which makes these sentences more acceptable,

b. * a man with whom she eloped t before living e

In Cinque (1986) the impossibility of PP parasitic gaps is a consequence of the nature of the gap itself: it is base-generated pro and he assumes that there is no PP equivalent of pro. This route would also be open for the analysis I propose in chapter three, since I also assume that a pro is base-generated in the position of the parasitic gap. However, this creates a problem for the analysis of clefts if, as I assume, a null operator is involved in the derivation of sentences such as (161).

161) It was to John that he gave the money.

Cinque extends his account of the ungrammaticality of (160) to the contrast between (162) and (163) as well.

162) a. ?' the man that you left London without visiting t
b. ?' the man that you believe the rumor that John killed t

163) a. *' the man to whom you left London without speaking t
b. *' the man to whom you believe the rumor that John gave all his money t

According to Cinque, the relative acceptability of (162) is due to the possibility of using the A'-bound resumptive pro strategy, as in the case of parasitic gaps. The sentences in (163) are ruled out for him because (i) both long extraction and successive cyclic movement are absolutely blocked by

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i.e. there is no parasitic gap in the adjunct, simply an unrealized dative argument.

complex NPs and adjuncts and (ii) there is no PP equivalent of pro to allow the (null) resumptive pronoun strategy to come into effect.

Since I analyse sentences such as those in (162) and (163) as involving extraction out of PP and the complex NP, this account of the contrast between (162) and (163) is not open for me. I propose that this contrast can be explained by the condition in (164).

164) Only NP may use the SPEC of PP or the SPEC of NP as an escape hatch for A′-movement.

This condition can be derived if the movement in question is substitution, as seems likely, and if the empty category base-generated in the SPEC of PP or NP to "receive" the moving category must be amember of the class of actual specifiers of PP or NP. As far as I know, PP never appears in either of those positions, therefore, a PP will never be able to pass through that position. With an appropriate reformulation of the definition of "barrier", condition (164) will account for the contrast between (162) and (163).

4.6 Remarks on Proper Government

4.6.1 Minimality and Head Government

In §4.3 I proposed an analysis of the *que/qui* alternation and the *croire/ritenére* facts which requires that the entire chain of the subject be present throughout the derivation, i.e. that at LF there be no link in the chain with its

members separated by even one barrier. The discussion in §4.4 did not take into account barriers created by the presence of a minimal governor; see (154) above for definitions. I will adopt the definition in (154b) for now. M-barriers are crucial for the ECP account of the <u>that-t</u> effect, illustrated in (165a) with a more detailed structure given in (165b).

165) a. Who do you think that t left
b. who_i $[_{IP}$ NP $[_{I'}$ I $[_{VP}$ t_i^2 $[_{VP}$ $[_{V'}$ V $[_{CP}$ t_i^2 $[_{C'}$ that $[_{IP}$ t_i^1 ...

By the definition in (154b) C′ is an M-barrier for t_i^1; t_i^1 = β, <u>that</u> = δ, C′ = α, and IP = τ. The intermediate trace t_i^2 will be blocked from governing t_i^1 by C′ and t_i^1 will not be marked [+τ]. The sentence is correctly ruled out.

It is well known that extraction of adjuncts is not subject to the <u>that-t</u> effect. The adjunct extraction equivalent of (165a), given in (166a), is fully grammatical.

166) a. How do you think that John fixed the car t
b. how_i $[_{IP}$ NP $[_{I'}$ I $[_{VP}$ t_i^2 $[_{VP}$ $[_{V'}$ V $[_{CP}$ t_i^2 $[_{C'}$ that $[_{IP}$ ... $[_{VP}$ t_i^1 ...

However, by the definition in (154b) C′ in (167b) is an M-barrier for t_i^1 just as it is in (165b); t_i^1 = β, <u>that</u> = δ, C′ = α, and IP = τ. The definition in (154b) incorrectly rules out (166a). Since, by the analysis proposed in §4.4.5, the A′-chains in sentences involving embedded infinitival complements of <u>croire/ritenére</u> verbs or an embedded <u>qui</u> complementizer are subject to the same conditions as the adjunct chain in (166a), (154b) will also incorrectly rule out those sentences.

(154b) also defines the embedded CP in (162b) and (163b) as an M-barrier for the trace in the SPEC of CP, t_i^2. In this case, $\beta = t_i^2$, $V = \delta$, $V' = \alpha$, and $CP = \tau$. To overcome this problem, which is also a problem for the Barriers definition of M-barrier, Chomsky suggests that X′ levels may fail to be projected either when a head has no features or when there is no structural motivation for it.

Chomsky proposed to solve the first problem, how to allow t_i^1 to be properly governed in (166a) but not (165a), by means of VP-fronting at LF. With the lower VP in (166b) adjoined to the lower IP, as in (167), C′ will no longer be a barrier for t_i^2 because there is no τ intervening between t_i^2 and t_i^3. (Recall that (154b) requires τ to be a maximal projection, not a segment of a category.)

167) $[_{CP}\ wh_i\ [_{IP}\ \ldots\ [_{VP}\ t_i^4\ [_{VP}\ V\ [_{CP}\ t_i^3\ [_{C'}\ that\ [_{IP}\ [_{VP}\ t_i^2\ [_{VP}\ V\ \ldots\ (t_i^1)\ ]\ [_{IP}\ \ldots\ t_{VP}\ \ldots$

The merits of this proposal notwithstanding, there are considerations which argue against its adoption. First, if LF VP-fronting is meant to be an analog of SS topicalization, it is unclear why sentences such as (166a) fail to have a topicalized interpretation.[45] Secondly, many speakers find VP

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45. N. Chomsky (p.c.) suggests that there is no relevant difference of meaning between topicalized and non-topicalized sentences and, therefore, VP-fronting at LF should be innocuous. I agree that the difference between topicalized and non-topicalized structures is not best characterized in terms of meaning, if by "meaning" is meant the lexical semantics, thematics, etc. of the sentences; nevertheless, there is a difference in focus which is clearly linked to the structural difference.

topicalization rather marked in English. If sentences such as (166a) obligatorily involve VP fronting, some explanation for their grammaticality in comparison with (168) would have to be found.[46]

168) I don't think that, fix the car, John ever will.

Finally, if traces at LF must be both antecedent governed (i.e. τ-marked) and head governed, LF VP-fronting creates structures in which the status of certain traces with respect to the head government requirement is unclear. In order to see that this is so, a more detailed version of (167) is needed, one which shows the effects of V-to-I raising.[47]

169) $[_{CP}$ wh_i $[_{IP}$ ... $[_{VP}$ t_i^4 $[_{VP}$ V $[_{CP}$ t_i^3 $[_{C'}$ that $[_{IP}$ $[_{VP}$ t_i^2 $[_{VP}$ t_v ... (t_i^1)] $[_{IP}$ ... $[_{I'}$ V/I t_{VP} ...

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46. There are other factors which decrease the acceptability of VP topicalized structures even more, for example, the particular modal or form of negation stranded by topicalization. The contrast between (i) - (iv) vs. (v) is particularly relevant in this regard.

i) * I think that, finished the painting by Monday, John will have.
ii) * I think that, have finished the painting by Monday, John will.
iii) * I think that, finished the painting, John will have by Monday.
iv) * I think that, have finished the painting, John will by Monday.

v) When do you think that John will have finished the painting?

47. In Barriers, it is argued that V-to-I raising takes place in the mapping from DS to SS in English as well as Romance. Since we are dealing with LF structures here, this issue is less relevant.

There are two traces which have a potentially questionable status in (169): t_v and t_i.[48] We might ask whether in both cases C = that can act as a head governor. Notice that no L- or M-barriers intervene between that and t_i; only category segments intervene and at least one full maximal projection is required to create either L- or M-barriers.[49] Notice that when the VP is in situ, as in the fragment of structure in (169′), the complex head V/I is a possible head governor for both traces.

169′) ... [$_{IP}$ ... [$_{I}$′ V/I [$_{VP}$ t_i [$_{VP}$ t_v ... (t_i′)] ...

However, in (167), V/I does not m-command either trace.[50] There doesn't seem to be anything blocking C from governing t_v

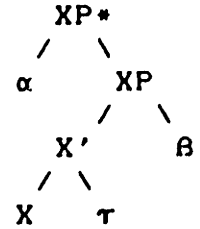
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48. If we adopt the LGB version of c-command, then t_v governs t_i. The question then becomes whether the trace of a verb may head govern; according to Baker (1985) the answer is no; according to Chomsky (class lectures, fall, 1986) the answer is yes.

49. Or a category segment immediately dominating a barrier, as I have argued above, following Belletti & Rizzi (1986).

50. That is, V/I does not m-command a category adjoined to IP under the Barriers definition or the definition proposed by Chomsky in class lectures (fall, 1986). However, a definition of command along the lines of that proposed in LGB would allow the adjoined category to be governed. Such a definition allows a head to command everything dominated by any segment of its projections. In (i), for example, X commands α, ß and τ. (By the Barriers definition and that in fn. 11 of chapter one, X m-commands only τ and ß.)

i)



and t_i[8]. But is C a possible head governor? There is a sharp contrast between the sentences in (170), a contrast which might well be attributed to the ability of I to head govern (when lexical in the appropriate sense) and the inability of C to do so.

170) a. ?? [$_{VP}$ Eat this mess], I think that he will not t_{VP}
b. * [$_{IP}$ he will not eat this mess], I think that t_{IP}

The contrast is even more striking in Italian, where VP and CP topicalize rather freely.

171) a. [$_{VP}$ Mangiato le mele], credo che Mario non abbia
'Eaten the apples, I think that Mario has not'
b. Penso che, [$_{CP}$ di sposare questa ragazza] Gianni si rifiuterà
'I think that, to marry this girl, G. will refuse'
c. * Penso che, [$_{IP}$ sposare questa ragazza] Gianni si rifiuterà di
d. * [$_{IP}$ Gianni si rifiuterà di sposare questa ragazza], penso che

I will assume, then, that C cannot act as a head governor for empty categories in IP adjoined positions.[8'] It appears that,

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51. The ungrammaticality of sentences such as (i), with the structure in (ii), does not give evidence one way or another on the issue of C as a head governor.

i) * Penso che, dormire, Gianni sembra
ii) ...[$_{CP}$ [$_{C'}$ che [$_{IP2}$ [$_{IP1}$ t_i dormire] [$_{IP2}$ Gianni$_i$ sembra t_{IP}]]]]

In (ii) the category IP1 intervenes between t_i and <u>che</u>, the potential head governor. I assume, as is consistent with the <u>Barriers</u> framework, that L-marking is not analogous to τ-marking, that is, a category is no longer L-marked if it is no longer sister to its L-marking head. Therefore, even if C could head govern traces, it would be blocked from governing t_i in (ii) by the presence of a barrier.

in the structure given in (167), there is no category capable of acting as a head governor for t_v and t_i^*.

At this point in the argument against the VP fronting solution to the absence of <u>that-t</u> effects with adjunct extraction an important question arises. First, assume, as I have above following Chomsky (1986, class lectures), that the ECP is satisfied only by antecedent government and that a separate head government requirement is imposed on non-pronominal empty categories. Can the head government requirement be satisfied once at some point in the derivation and then fail to be met at some later point in the derivation? If we conceive of head government as a kind of τ'-marking, on a par with τ-marking, then subsequent applications of Affect α might obliterate the context of head government, nevertheless leaving a trace licensed wrt the head government requirement. If this is the appropriate conception of head government, then both t_v and t_i^* in (169) will be τ'-marked by V/I. Regardless of the status of the VP fronting analysis of (166a), the question just raised is an interesting one, and I will examine it in more detail in the next subsection. In §4.6.4 I will discuss some possible means of accounting for the contrast between (165a) and (166a) which do not rely on VP fronting and which are consistent with the proposals in §4.4.

4.6.2 Head Government

Longobardi (1985) argues, on the basis of the data in

(172), that a "local" ECP, such as that of LGB, is not able to account adequately for the distribution of empty categories.

172) a. * t_i dormire, Gianni$_i$ sembra.
b. PRO$_i$ dormire, Gianni$_i$ vorrebbe.
c. ?* Quale ragazza$_i$ pensi che di sposare t_i Gianni si rifiuterà

In LGB (172a) is out because t_i fails to be properly governed; (172b) is grammatical since PRO does not fall under the ECP. (172c) is problematic for an LGB-type ECP since t_i is governed by a lexical head (sposare) and therefore properly governed. Longobardi demonstrates that the ungrammaticality of (172a) and (172c) can be accounted for by the Connectedness Condition (CCon) of Kayne (1983). However, the CCon fails to account for the grammaticality of (173).

173) a. How likely to win is John?
b. $[_{CP}$ [how likely $[_{IP}$ t_i to win]] $[_{IP}$ John$_i$ is t_{IP}]]

As in (172c) the empty category is contained in a left branch. It is, therefore, impossible to construct a connected path which includes the antecedent of the empty category and the empty category itself. The CCon incorrectly rules (173a) out.[52] The same contrast is marginally apparent in English

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52. Longobardi (1985) noticed that sentences such as those in (i) and (ii) are grammatical in Italian so long as the trace contained in the moved category is an NP-trace or a clitic trace. (The contrast between a sentence like (172c) and (173a) cannot be tested because there are no raising adjectives in Italian.) Examples from Longobardi are given below.

i) [Tradito t_i da sua moglie]$_j$, credo che Mario$_i$ non sia mai stato t_j

when topicalization rather than wh-movement is involved, although the relative awkwardness of clausal topicalization in English complicates the judgements.

174) a. * t_i to win, John$_i$ is not likely.
b. ?? Likely t_i to win, John$_i$ is not.

A theory which requires that traces be both head governed and antecedent governed provides a neat account of these facts and offers the beginning of an answer to the ECP-related questions mentioned above. In (173) t_i is head governed in its SS position, while in (172a) it is not. The contrast between the two suggests that head government must be satisfied on the basis of the SS position of the empty category, i.e. head government cannot be satisfied "under reconstruction".[53] This would rule out the possibility that the complex head V/I in (169) could act as the head governor for the traces t_i[e] and t_v by virtue

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ii) [Offerte t_i a sua moglie]$_j$, credo che Mario ancora no le$_i$ abbia t_j

He suggests that the CCon should be restricted to A'-bound empty categories, perhaps by being incorporated into the definition of A'-chain formation. Pesetsky (1982) also notices that the CCon is unable to account for the distribution of NP-traces.

53. Through the rest of this portion of the discussion, "under reconstruction" should be taken as shorthand for three rather different possibilities: (1) the τ'-marking approach to head government which licenses the empty category by virtue of its having been head governed prior to reaching its SS position; (2) the possibility that head government is satisfied by an SS mechanism (such as that of Barss (1986), for example); and (3) the possibility that head government is satisfied by lowering the constituent containing the empty category to its original position at LF.

of having governed the traces at some point prior to VP fronting at LF.

If John is the antecedent governor of t_i in (173), then it appears that antecedent government need not be satisfied on the basis of the SS positions of the trace and antecedent governor. However, the analysis of passive and raising given in Barriers makes it somewhat difficult to establish whether this is the case. According to that analysis, likely (or in the case of passive, the passive participle) acts as the antecedent governor for t_i; it is licensed to do so by the formation of a chain which includes the coindexed elements John, INFL, and likely. (John and INFL are coindexed by agreement; INFL and likely are coindexed by a special head coindexing rule.) Therefore, in (174), the local antecedent governor as well as the local head governor is in the proper position at SS. There is a conceptual consideration to take into account here: antecedent government licenses empty categories by ensuring that they are τ-marked at some point in the derivation. Chomsky's version of the L&S mechanism of τ-marking allows the empty category created by movement of an argument to be τ-marked at any point in the derivation prior to the ECP filter. For example, t could be τ-marked by who at the point in the derivation shown in (175a) or by t′ at the point in the derivation shown in (175b).

175) a. $[_{CP}\ [_{IP}\ \ldots\ [_{VP}\ \text{who}\ [_{VP}\ \ldots\ t\ \ldots\ ]]]]$
b. $[_{CP}\ \text{who}\ [_{IP}\ \ldots\ [_{VP}\ t'\ [_{VP}\ \ldots\ t\ \ldots\ ]]]]$

This approach to τ-marking allows a derivation for (173a) in which the NP-trace is created and τ-marked before wh-movement applies, as in (176a). (The lines indicate the "extended chain" which is formed to facilitate τ-marking.) Once wh-movement applies, the structure for (173a) is as shown in (176b).

176) a. $[_{c''}\ [_{i''}$ John$_i$ is$_i$ [how likely$_i$ t$_i$ to win]]]
$\quad\quad\quad

evidence that (i) holds. Turning to (ii), there are three ways in which the τ-marking configuration for a trace might be distorted: the trace itself moves, a category containing the trace moves, or the τ-marker moves. I will not discuss the third possibility; see fn. 47. In order to assess the plausibility of (ii) we need to know whether allowing τ-marked traces to move (either by being subject to Move α themselves or by being contained in a category subject to Move α) is crucial for any licit derivations or, on the other hand, whether it derives any sentences which cannot be ruled out by other constraints; that is, we need answers to the following questions:

177) a. Are there grammatical sentences which cannot be derived unless a τ-marked trace moves to a position in which it is not properly governed by an antecedent?
b. Are there ungrammatical sentences which are allowed by assuming that τ-marked traces can move?

Keeping these questions in mind, consider the sentences in (178) and (179).

178) a. There is some Roquefort in the refrigerator.
b. There is too much money in the safe.
c. There are four people to interview.

179) a. What sort of cheese is there in the refrigerator?
b. How much money is there in the safe?
c. How many people are there to interview?

The KoL analysis of the sentences in (178) involves movement of the post-copular subject to the position of the expletive at LF, i.e. expletive replacement, yielding an LF representa-

tion along the lines of (180b) from SS representations like (180a).[56]

180) a. ... $[_{IP}$ there is NP_i ...
b. ... $[_{IP}$ NP_i is e_i ...

Expletive replacement is an instance of LF A-movement and e_i in (180b) is an anaphor subject to the ECP and Condition A of the Binding Theory.

In contrast to (178), the post-copular NP in (179) is an empty category at SS, as demonstrated in this section of the SS representation of (179).

181) ... $[_{CP}$ wh_i $[_{IP}$ there $[_{I'}$ ... $[_{XP}$ t_i' $[_{XP}$ ... t_i ...
[+T]

Whether XP is a small clause or a VP containing a small clause, adjunction should be allowed and t_i will be antecedent governed (+T-marked) by t_i' by SS, as shown.[57] At LF, expletive replacement will apply, moving t_i to the SS position of <u>there</u>, giving the LF representation in (182).

182) ... $[_{CP}$ wh_i $[_{IP}$ t_i $[_{I'}$ ... $[_{XP}$ t_i' $[_{XP}$ ... e_i ...
[+T]

---

56. I leave open the question of whether there is coindexing between the post-copular NP and the expletive.

57. Note that this is not a case of "improper movement" such as (i)

i) $[_{IP}$ $John_i$ ... was $[_{VP}$ t_i' $[_{V'}$ elected t_i ...

since, in (181), no constraints will be violated if t_i is a variable at this point in the derivation; in fact, t_i must be a variable throughout the derivation. In (i), however, t_i should never be a variable.

In the mapping from SS to LF e_i might be τ-marked by either the adjoined trace t_i' (which could subsequently delete) or the copula (assuming the Barriers approach to proper government of anaphoric traces in raising constructions).

These sentences are not completely convincing evidence that the answer to question (177a) is yes. Looking again at the LF representation (182), it appears that the overt antecedent wh_i could τ-mark the trace in pre-verbal subject position after expletive replacement occurs. In fact, filling the adjacent SPEC with another wh-phrase, as in (183), results in ungrammaticality, which would seem to indicate that the LF subject trace is τ-marked from the SPEC of CP at LF.

183) a. * How many people do you wonder in which office there are
b. *? What kind of cheese do you know whether there is in the refrigerator

(183b) seems distinctly better than (183a) and not, for most speakers, as strong as an ECP violation, a fact which strongly supports the "movement of τ-marked trace" hypothesis.[58] Moreover, the sentences in (184) are as bad as (183a), suggesting that the stronger deviance of (183a) may have to do with other factors.

184) a. * Which man do you wonder how foolish John considers
b. * Which man do you wonder how foolish John believes to be

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58. The ungrammaticality of (178b) is predicted by the relativized Subjacency Condition of §4.4.

c. * Which man do you wonder how foolish John believes t_i is t_i

Another sort of example which might indicate whether the trace in pre-verbal position after expletive replacement may be τ-marked from the SPEC of CP is given below in (185), with the relevant portions of SS and LF representations in (186) and (187).

185) What sort of cheese do you think that there is in the refrigerator?

186) $wh_i \ldots [_{CP}\ t_i'' \text{ that } [_{IP} \text{ there} \ldots [_{XP}\ t_i' \ [_{XP} \ldots t_i \ldots$

187) $wh_i \ldots [_{CP}\ t_i'' \ [_{C'} \text{ that } [_{IP}\ t_i \ldots [_{XP}\ t_i' \ [_{XP} \ldots e_i \ldots$
$\uparrow_____|$

If t_i is not τ-marked at SS by t_i', it cannot be τ-marked at all, since t_i'' will be blocked from governing t_i by the M-barrier C'.[59] (This is assuming that the complementizer <u>that</u> may not delete at LF.) (185) gives a definitive answer to question (177a): if expletive replacement exists and if <u>that</u>-deletion at LF is not possible, then τ-marked traces may move to a position in which they are no longer antecedent governed.

Let's turn now to (177b), are there ungrammatical sentences which are allowed by assuming that τ-marked traces may move? The first thing to observe is that the moveable τ-marked traces which figured in the discussion above were all variables, that is, arguments. They should, therefore, be

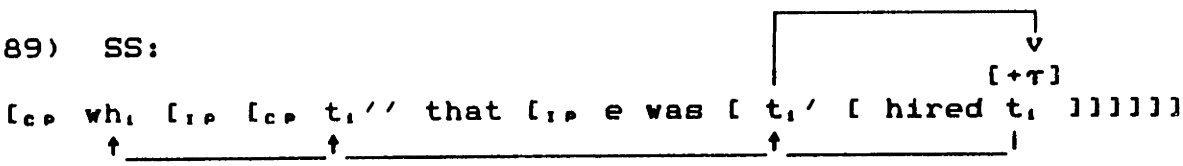
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59. Sam Epstein independently noticed the relevance of sentences such as (185) for these issues; see Epstein (in progress) for discussion.

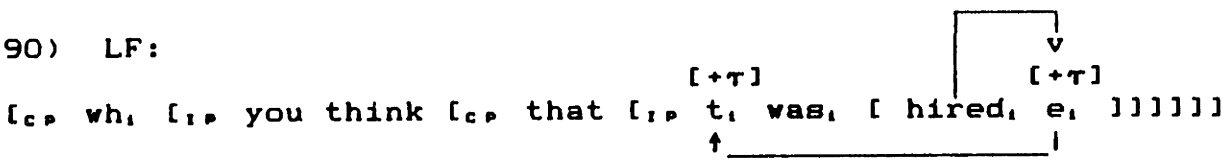
subject to any constraints which apply to operations affecting overt arguments, for example, the θ-criterion, the principle of Recoverability of Deletion, and the Projection Principle. There is at least one ungrammatical sentence which has a derivation involving movement of a τ-marked trace, which is not obviously ruled out by independently motivated constraints. This is (188), with the derivation shown in (189) and (190).

188) * Who$_i$ do you think that t_i' was hired t_i

189) SS:



190) LF:



At SS the derivation involves only A′-movement; the trace t_i is a variable rather than an NP-trace. In (189) e is the structural subject position, not a member of any chain. who$_i$ adjoins to the lower VP, moves through the embedded SPEC of CP, and up to the matrix CP (adjoining to the matrix VP on the way which has not been indicated). The variable in argument position, t_i, is τ-marked by the adjoined trace, t_i'. At LF the intermediate traces delete ard the τ-marked variable moves to the subject position leaving an NP-trace behind (e_i). This NP-trace is τ-marked by means of the antecedent government chain of Barriers, i.e. agreement between the subject (t_i) and

INFL, coindexation of INFL and the past participle. All empty categories in (190) are properly governed and licensed.

Several ways of ruling out this derivation come to mind. However, the grammaticality of (191),[60]

191) Quale autore pensi che era stato intervistato?
'Which author do you think that was interviewed?'

suggests that the difference should be linked to the pro-drop parameter. The SS representation (189) will be ruled out in English since that language possesses no null expletives; there is no empty category which will be licensed in the position of e in (189). In a pro-drop language with null expletives, the same representation will be well-formed. The operative principle here is the Extended Projection Principle, which requires all clauses to have subjects. Thus, it seems that there is no bar to assuming what is, after all, the null hypothesis: τ-marked traces may be moved after τ-marking to positions in which they are not antecedent governed.

4.6.4 Minimality

In §4.6.1 I pointed out that the definition of M-barrier in (154b), repeated below, incorrectly rules out the French and Italian sentences in (192) and (193) and the English (194).[61]

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60. The Spanish analog of (191) is also grammatical.

61. Baker (1985) has argued that syntactic incorporation is head to head movement, which is subject tot he ECP. Therefore, incorporation only occurs under government and intervening

154) b. α is an M-barrier for β if α includes β, δ (an X° c-commander of β), and τ (a maximal projection not necessarily distinct from α).

192) a. il ragazzo che Gianni penso che ritieni essere intelligente
'the boy that John thinks that you believe to be intelligent'

b. la femme que je sais que tu crois être le plus intelligent de tous
'the woman that I know that you believe to be the most intelligent of all'

193) la femme que je sais que tu crois qui aime Jean
'the woman that I know that you believe loves John'

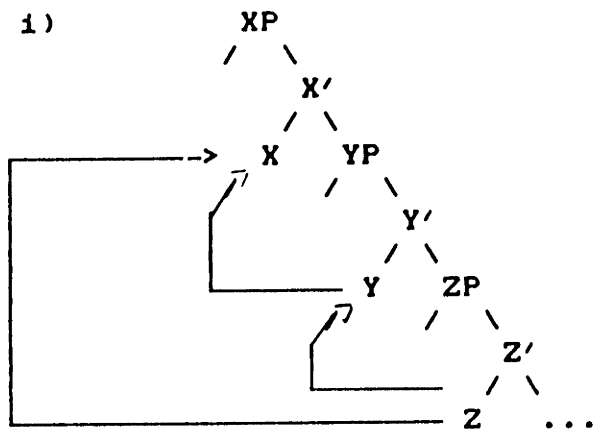
194) How do you think that John fixed the car?

In (192) - (194) there is a subsection of structure equivalent

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heads block incorporation. In the hypothetical structure in (i), three possible instances of head movement are indicated and in (ii) the structures which might result from these moves are given. Minimality is taken to block case d in (ii).

i)



ii) a. ... $[_{x_P}$ X/Y $[_{v_P}$ t_y $[_{z_P}$ Z ...
b. ... $[_{x_P}$ X $[_{v_P}$ Y/Z $[_{z_P}$ t_z ...
c. ... $[_{x_P}$ X/Y/Z $[_{v_P}$ $t_{y,z}$ $[_{z_P}$ t_z ...
d. * ... $[_{x_P}$ X/Z $[_{v_P}$ Y $[_{z_P}$ t_z ...

Since all the minimality proposals discussed in the text can handle these facts, I will not discuss them any further.

to (195). If (154b) is adopted then C′ acts as an M-barrier preventing t′ from antecedent governing t.

195) ...[$_{CP}$ t′ [$_{C}$′ C [$_{IP}$...[$_{VP}$ t [$_{VP}$...

(154b) incorrectly predicts that (192) - (194) will be ECP violations.

There is something odd about the minimality account of the contrast between (194) and (196):

196) * Who do you think that t left?

In both cases the relation between the potential governor and the "minimal" or closer governor remains the same, what differentiates the two sentences is the configurational distance between the governed element and the two governors. Observationally, it seems that when the trace is "far enough" from the potential governors, the effects of minimality disappear. The definition of M-barrier in (154b) handles this peculiarity by attributing minimality effects to the presence of both a minimal governor and a maximal projection. VP fronting eliminates the maximal projection and, therefore, the minimality effects. But it seems to me that the peculiarity resurfaces with this solution: the relation between the two governors is the same, but, if the the trace is "close enough", minimality effects disappear. I have given some arguments against the VP fronting solution to the (194)/(196) contrast in §4.6.1 and I will not review them. Instead, I will briefly examine two

possible alternatives to this approach, both of which are consistent with the rest of proposals I have made thus far.

L&S account for the (194)/(196) contrast by assuming free complementizer deletion at LF. For this account to work, it is crucial that all argument traces which exist at SS receive [±τ] at SS. Therefore, the trace in subject position in (196) will be receive [-τ] at SS and, since τ-marking cannot be changed, even if the complementizer deletes at LF (196) will be ruled out. (194) on the other hand involves an adjunct trace and adjunct traces are not τ-marked until LF; in particular, they are not marked [-τ] at SS if they are not properly governed at that level. At LF the complementizer in (194) deletes and t′ antecedent governs and marks t [+τ] as required. The definition of M-barrier in (154b) is perfectly consistent with this account.[62] Moreover, the L&S approach handles (192) and (193) equally well. The only argument trace in these constructions is the one in subject position of the embedded clause and this will be marked [+τ] at SS, either by the coindexed qui complementizer or a trace in SPEC of CP. The other traces, which I have argued are required to be present throughout the derivation, are non-argument traces and, as such, cannot be τ-marked until LF. At LF the complementizers delete and the intermediate traces are all successfully marked [+τ].

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62. The problem with V′ remains with the L&S account, but the possibility of resorting to the optionality of X′ still exists.

The approach to minimality expressed in definition (154b) regards any kind of government as being blocked by the intervention of a closer governing head (and a suitable configuration of projections). Rizzi (class lectures, 1986) suggests an alternative "relativized" version of minimality which allows δ to block government of β by α only if α and δ are the same sort of governor, e.g. only heads may block head government and only XPs may block antecedent government by an XP. Rizzi's minimality condition[63] was designed to exclude subject that-t effects from the realm of minimality violations. I suggest instead the minimality condition in (197), which is similar to Rizzi's but which treats the subject that-t effect as a minimality violation.

197) Given α, δ, β where
i) α, δ govern β and
ii) α, δ are potential antecedents for β

α antecedent governs β iff there is an X^n, n≥1, which includes α and excludes δ.

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63. The definitions from Rizzi's class lectures (1986) are given below.

i) Relativized Minimality: α X-governs β only if there is no τ such that
a. τ is a potential X-governor for β
b. τ is closer to β than α

ii) Closeness in (ib) is determined in terms of the length of a path between two elements.

iii) X-government = (head government, antecedent government from an A-position, antecedent government from an A′-position)

The definition of "potential antecedent" is crucial and must include at least the following two statements:

198) a. XP is a potential antecedent for YP iff X=Y.
b. Complementizer <u>that</u> counts as a potential antecedent for a trace in the subject position of its clause.[64]

The stipulative nature of (198b) is apparent; rather than attempting to justify it directly, I will enumerate some of the benefits of a relativized minimality condition leaving a more insightful formulation of the condition for further research.[65]

A relativized version of minimality does away with the need for X'-deletion and complementizer deletion as methods of limiting the effects of the condition for adjunct traces. It also has the advantage of accounting for Obenauer's (1984) "pseudo-opacity" effects. Obenauer (1976, cited in (1984))

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64. In order to permit sentences such as those in (192) and (193), it is crucial that a complementizer not be able to block τ-marking of intermediate traces resulting from the movement of the subject of another clause. For example, the structure for sentences such as those in (192) looks something like (i), greatly simplified. (C = <u>que</u> or <u>che</u>; V~ = <u>croire</u>, <u>ritenére</u>, etc.)

i) $\ldots[_{CP}\ O_i\ [_{IP}\ldots[_{VP}\ t_i^3\ [_{VP}\ldots[_{CP}\ t_i^4\ C\ [_{IP}\ldots [_{VP}\ t_i^2\ [_{V'}\ V^{\sim}\ [_{CP}\ t_i^1\ [_{IP}\ t_i^0\ldots]]]]]\ldots$

t_i^0 is the trace of origin; t_i^1 is the trace required for case-marking purposes. By (111) all traces in (i) must be marked $+\tau$. If C is a potential antecedent for t_i^2 then t_i^4 will not be able to τ-mark t_i^3. Therefore, complementizers must only be potential antecedents for the subjects of their own clauses.

65. Most of the arguments below follow Rizzi's (1986) class lectures on the topic, at least in spirit.

noticed that the presence of certain adverbial quantifiers blocks wh-movement of combien from object position.[66]

199) a. * Combien as-tu beaucoup consulté de livres?
b. * Combien a-t-il beaucoup rencontré de collègues?
c. * Combien as-tu peu conduit de voitures?

Wh-movement over these QP-adverbs is grammatical so long as the moved element is not combien alone.

200) a. Combien de livres as-tu beaucoup consultés?
b. Combien de collègues a-t-il beaucoup rencontrés?
c. Combien de voitures as-tu peu conduites?

201) a. Qui a-t-il beaucoup rencontré?
b. Avec qui a-t-elle beaucoup joué?
c. un hotel dans lequel ils sont beaucoup descendus

Even when QP-adverbs such as beaucoup receive a less quantificational interpretation, they do not permit extraction of combien, as illustrated by the ungrammaticality of (202). Other adverbs which are not QPs do not induce pseudo-opacity effects, as illustrated in (203).

202) a. * Combien a-t-il beaucoup aimé de femmes?
b. * Combien a-t-il peu apprécié de films?

203) a. ? Combien a-t-il passionnément aimé de femmes?
b. ? Combien a-t-il modérément apprécié de films?

Finally, QP-adverbs can block extraction from NPs into which they cannot themselves quantify. (204a) shows that combien may bind into the post-verbal NP and (204b) indicates that

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66. The data in (199) - (205) are from Obenauer (1984).

beaucoup may not. The ungrammaticality of (205a) shows that beaucoup blocks extraction of combien even in this case.

204) a. Combien (l')as-tu applaudi(e) de fois?
'How many times did you applaud (her)?'
b. * J'ai beaucoup applaudi de fois.
'I applauded many times.'

205) a. * Combien (l')as-tu beaucoup applaudi(e) de fois?
b. Combien de fois (l')as-tu beaucoup applaudi(e)?
'How many times did you applaud (her) a lot?'

(205b) is included to show that there is nothing inherently incompatible about the combien-beaucoup combination.[67]

The relativized minimality condition straightforwardly rules out the ungrammatical sentences in (199), (202), (204) and (205) given the L&S/Barriers approach to the ECP and certain additional, well-motivated, assumptions. I will restrict the discussion to A'-chains and will assume that the class of antecedent governors and elements which may block antecedent government is restricted to categories which are not in A-positions, i.e. heads and A'-elements. As combien and the members of the beaucoup class of adverbs are QPs, the configuration which results in ungrammaticality in the sentences above is that shown in (206), where both QPs are in A'-positions.

206) $\ldots QP_i \ldots QP_j \ldots t_i \ldots$

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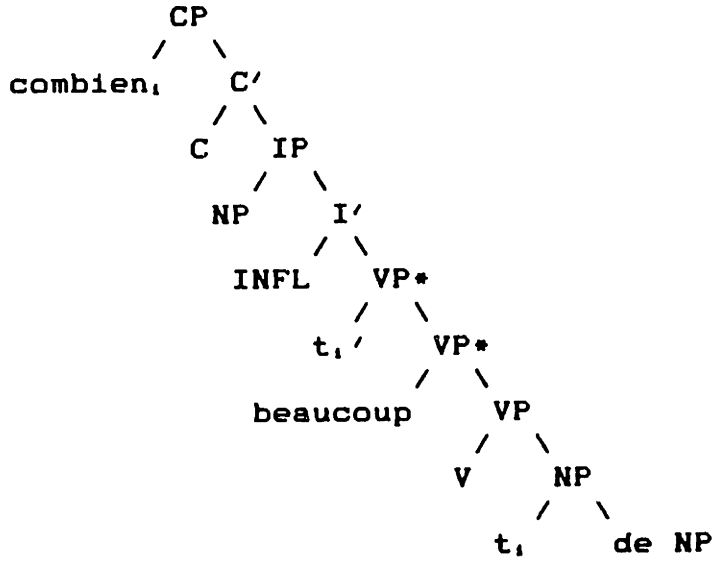
67. Obenauer offers extensive arguments to show that the ungrammatical combinations of combien/beaucoup are not ruled out by a requirement that combien pass through the pre-verbal position (occupied by beaucoup) on its way to SPEC of CP.

What is the nature of t_i, the trace of combien, in these constructions? If combien is a quantificational specifier, then its NP-internal trace will be a non-argument. For concreteness, I will adopt the approach to the τ-marking of non-arguments which incorporates (111) from §4.4.5, repeated below, although the L&S alternative works equally well in this case.

111) Any A′-chain containing a non-pronominal empty category in an A′-position at LF must be entirely represented throughout the derivation.

(111) requires the A′-chain of combien to be fully represented throughout the derivation, which in turn requires that all empty categories in the chain receive [+τ] before the ECP is checked at the end of the LF mapping. The ungrammatical sentences above will be ruled out by the relativized version of minimality if there is at least one empty category in the chain $(QP_i, \ldots, t_i)$ which is blocked from being antecedent governed by the presence of beaucoup as a closer governor. In order to see if such a state of affairs holds in these sentences, it is necessary to look at the structure of one in more detail. Assume that beaucoup is a VP-adjoined adverbial; after wh-movement of combien the structure of the ungrammatical sentences above will be essentially as in (207). (I have purposely been vague about the internal structure of NP as there is only one thing which is relevant for this discussion: the trace of combien must be a non-argument position.)

207)



In order for the chain (combien, t_i', t_i) to be licensed, both empty categories must be antecedent governed. Our working definition of relativized minimality would prevent <u>combien</u> from antecedent governing t_i' only if there were a "closer" QP in an A′-position which governed the trace. There is no such QP between <u>combien</u> and t_i', therefore t_i' may be marked [+τ]. For t_i to be marked [+τ], t_i' must antecedent govern it, but <u>beaucoup</u>, a QP in an A′-position intervenes between t_i' and t_i. By relativized minimality, t_i' does not antecedent govern t_i and an ECP violation is the result.

The sentences in (208) are, at first glance, problematic for the relativized minimality approach. (In (208b) $O_{i,j}$ is the null relative operator; the slash indexing is meant to indicate that the sentence is grammatical with either operator corresponding to either variable.)

208) a. * Combien sais-tu où inviter t de filles?
'How many do you know where to invite t of girls?'

b. l'uomo$_{i,j}$ ($O_{i,j}$) che non so chi$_{i,j}$ e$_j$ conosca e$_i$

In (208a) antecedent government of the trace of combien is apparently blocked, but the intervening A′-operator is not a QP. The minimality condition in (197) could be altered to account for this by substituting for the category matching requirement, the requirement that α and δ (the potential governor and the minimal governor) match in argument status. Since combien and où are both non-arguments, (208a) is ruled out. However, this revision is unnecessary as long as the presence of the intermediate wh-operator creates at least one barrier. The ungrammaticality of (209) indicates that an embedded infinitival question such as that in (208a) does indeed create at least one barrier.

209) * Où$_i$ sais-tu quelles femmes$_j$ inviter t$_j$ t$_i$

As in English, extraction of a non-argument over even one barrier results in an ECP violation.

Turning now to (208b), the sentence is grammatical with either indexing configuration shown in (210).

210) a. $wh_i \ldots wh_j \ldots e_j \ldots e_i$
b. $wh_j \ldots wh_i \ldots e_j \ldots e_i$

The indexing in (210b) arises as a result of the resumptive pronoun strategy with the resumptive pronoun being, in this

case, the null pronominal in subject position; that is, (210b) is properly represented as (210b′).[68]

210) b.′ $wh_j \ldots wh_i \ldots pro_j \ldots t_i$

The construction in (208b) seems to pose serious problem for relativized minimality regardless of which indexing holds, given that both configurations in (210) are similar to the configuration which resulted in an ECP violation in the combien/beaucoup sentences. The difference between (208b) and the combien/beaucoup sentences is that the former involves argument chains rather than non-argument chains. Therefore, it is only necessary for the traces in argument positions to be properly governed; in the normal case, intermediate traces in an argument A′-chain need not be properly governed.[69] Looking at (210a,b) in more detail, it is clear that in each case there is an antecedent governor for the argument trace.[70]

211) a. $wh_i \ldots wh_j\ [_{IP}\ t_j \ldots [_{VP}\ t_i' \ [_{VP} \ldots t_i \ldots$
b. $wh_j \ldots wh_i\ [_{IP}\ pro_j \ldots [_{VP}\ t_i' \ [_{VP} \ldots t_i \ldots$

In (211a) t_i' antecedent governs t_i and wh_j antecedent governs t_j. In (211b) t_i' agains antecedent governs t_i, but antecedent government is irrelevant to the licensing of the null resump-

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68. This is not an instance of the A′-bound pro strategy of Cinque (1986), discussed above; rather, this is a case where the null pronominal, independently licensed by AGR, acts as a resumptive pronoun in a manner completely parallel to overt resumptive pronouns.

69. The exceptions being those cases discussed in §4.4.5.

70. There is also a head governor in each case.

tive pronoun as it is not subject to the ECP. Neither indexing possibility for (208b) is ruled out by relativized minimality.

The original purpose of this section was to find a definition of minimality which would not rule out the sentences in (192) - (194). The minimality condition in (197) has this property and, in addition, accounts for a wide range of facts beyond the scope of the definition of M-barrier in (154b). Nevertheless, the stipulative nature of clause (b) of the relativized minimality condition suggests that something is still being missed in the analysis of that-t effects.

REFERENCES

Abney, S. (1985), "Functional Elements and Licensing," GLOW.

Abney, S. (1987), The English Noun Phrase in Its Sentential Aspect, MIT Ph.D. dissertation.

Akmajian, A. (1970), Aspects of the Grammar of Focus in English, MIT Ph.D. dissertation.

Andrews, A. (1982), "A Note on the Constituent Structure of Adverbials and Auxiliaries," Linguistic Inqury 13, 313-317.

Aoun, J. (1981), The Formal Nature of Anaphoric Relations, MIT Ph.D. dissertation.

Aoun, J. (1985), A Grammar of Anaphora, MIT Press.

Aoun, J. & Clark, R. (1984), "On Non-overt Operators," ms. USC/UCLA.

Aoun, J. & D. Sportiche. (1981), "On the Formal Theory of Government," The Linguistic Review 2.3.

Aoun, J., N. Hornstein, & D. Sportiche. (1981), "Some Aspects of Wide Scope Quantification," Journal of Linguistic Research 1, 69-95.

Bach, E. (1982), "Purpose Clauses and Control," in P. Jacobson & G. Pullum, eds., The Nature of Syntactic Representation, Reidel.

Baker, M. (1985), Incorporation: A Theory of Grammatical Function Changing, Ph.D. dissertation, MIT.

Barss, A. (1984), "Purpose Clauses, Control and Events," ms. MIT.

Barss, A. (1986), Chains and Anaphoric Dependence: On Reconstruction and Its Implications, Ph.D. diss., MIT.

Belletti, A., L. Brandi & L. Rizzi, eds. (1981), Theory of Markedness in Generative Grammar, Proceedings of the 1979 GLOW conference.

Belletti, A. & Rizzi, L. (1986), "Psych-verbs and Th-theory," Lexicon Project Working Papers 13, MIT.

Bennis, H. & T. Hoekstra. (1985), "Parasitic Gaps in Dutch," in the Proceedings of NELS 15, GLSA.

Bordelois, I. (1986), "On the Vacuousness of Vacuous Operators," in MIT Working Papers in Linguistics, Anniversary Volume.

Borer, H. (1986a), "I-Subjects," Linguistic Inquiry 17, 375-416.

Borer, H. (1986b), "Anaphoric AGR," ms., UC/Irvine.

Bowers, J. (1970), "Adjectives and Adverbs in English," ms., Indiana University Linguistics Club.

Brame, M. (1980), "hope," Linguistic Analysis 6, 247-253.

Bresnan, J. (1970), "On complementizers: Toward a syntactic theory of complement types," Foundations of Language 6, 297-321.

Bresnan, J. (1973), "Syntax of the Comparative Clause Construction in English," Linguistic Inquiry 4, 275-343.

Bresnan, J. (1976), "On the Form and Functioning of Transformations," Linguistic Inquiry 7, 3-40.

Bresnan, J. (1977), "Variables in the Theory of Transformations," in Culicover et al., eds.

Bresnan, J. (1982), "Control and Complementation," Linguistic Inquiry 13, 343-434.

Bresnan, J. & J. Grimshaw. (1978), "The Syntax of Free Relatives in English," Linguistic Inquiry 9, 331-391.

Brody, M. (1984), "On Contextual Definitions and the Role of Chains," Linguistic Inquiry 15, 355-381.

Brody, M. (1985), "On the Complementary Distribution of Empty Categories," Linguistic Inquiry 16, 505-546.

Browning, M. (1986), "Null Operators and Their Antecedents," NELS 17.

Cattell, R. (1976), "Constraints on Movement Rules," Language 52, 18-50.

Chierchia, G. (1984), Topics in the Syntax and Semantics of Infinitives and Gerunds, UMass/Amherst Ph.D. dissertation.

Chomsky, N. (1965), Aspects of the Theory of Syntax, MIT Press.

Chomsky, N. (1973), "Conditions on Transformations," in A Festschrifft for Morris Halle, S. Anderson & P. Kiparsky, eds., Hlot, Rinehart & Winston.

Chomsky, N. (1975), "Conditions on Rules of Grammar," Linguistic Analysis 2.

Chomsky, N. (1977), "On Wh-Movement," in Culicover et al., eds.

Chomsky, N. (1980), "On Binding," Linguistic Inquiry 11, 1-46.

Chomsky, N. (1981), Lectures on Government and Binding, Foris.

Chomsky, N. (1982), Some Concepts and Consequence of the Theory of Government and Binding, MIT Press.

Chomsky, N. (1986a), Barriers, MIT Press, Cambridge, MA.

Chomsky, N. (1986b), Knowledge of Language: Its Nature, Origin and Use, Praeger, New York.

Chomsky, N. & H. Lasnik. (1977), "Filters & Control," Linguistic Inquiry 8, 425-504.

Chung, S. (1984), "Identifiability and Null Objects in Chamorro," Proceedings of the Tenth Annual Meeting of the Berkeley Linguistics Society.

Cinque, G. (1982), "Clitic Left Dislocation in Italian and the Move α Parameter," ms.

Cinque, G. (1986), "A′-bound pro vs. variable," ms., Universita di Venezia.

Cinque, G. (1987), "Some Consequences for the Theory of Bounding," ms., Universita di Venezia.

Cole, J. (1985), "Null Arguments in Hindi: Towards a Theory of Null Anaphora," ms., MIT.

Contreras, H. (1984), "A Note on Parasitic Gaps," Linguistic Inquiry 15, 704-713.

Contreras, H. (1986), "Parasitic Gaps and Conditions on A′-chains," ms.

Couquaux, D. (1981), "French Predication and Linguistic Theory," in May & Koster, eds.

Culicover, P., T. Wasow and A. Akmajian, eds. (1977), Formal Syntax, Academic Press.

Davidson, D. (1967), "The Logical Form of Action Sentences," in Essays on Actions and Events (1980), O.U.P.

Emonds, J. (1976), A Transformational Approach to English Syntax, Academic Press.

Engdahl, E. (1981/83), "Parasitic Gaps," Linguistics & Philosophy 6, 5-34.

Engdahl, E. (1981), "Multiple Gaps in English and Swedish," in Proceedings of the Sixth Scandinavian Conference of Linguistics, T. Freitheim & L. Hellan, eds., Tapir.

Epstein, S. D. (1983), "On the Interpretation of the Base-generated Empty Categories in English," ms., UConn.

Epstein, S. D. (1984), "Quantifier-pro and the LF Representation of PRO...," Linguistic Inquiry 15, 499-504.

Epstein, S. D. (in progress), UConn Ph.D. dissertation.

Erteschik, N. (1973), On the Nature of Island Constraints, MIT Ph.D. dissertation.

Faraci, R. (1974), Aspects of the Grammar of Infinitives and for Phrases, MIT Ph.D. dissertation.

Freidin, R. & H. Lasnik. (1979/81), "Disjoint Reference and Wh-trace," Linguistic Inquiry 12, 39-53.

Fukui, N. (1987), "LF Extractions and the Nature of Antecedent Government," to appear in Natural Language and Linguistic Theory.

Geis, M. (1970), "Temporal Prepositions as Underlying Verbs," in papers from the Sixth Regional Meeting: Chicago Linguistics Society, Univ. of Chicago.

George, L. (1980), Analogical Generalization in Natural Language Syntax, MIT Ph.D. dissertation.

Giorgi, A. & Longobardi, G. (1986), "A Directional Parameter Within NP," talk given at MIT Linguistics Colloquium.

Grinder, J. (1970), "Super Equi-NP Deletion," in Papers from the Sixth Regional Meeting of the Chicago Linguistic Society, 297-317.

Grinder, J. (1971), "A Reply to 'Super Equi-NP Deletion as Dative Deletion'" in Papers from the Seventh Regional Meeting of the Chicago Linguistic Society, 101-111.

Guéron, J., H.-G. Obenauer & J.-Y. Pollock. (1985), Grammatical Representation, Foris.

Heggie, L. (1986), "The Range of Null Operators: Evidence from Clefting," ms., USC.

Higginbotham, J. (1980), "Pronouns and Bound Variables," Linguistic Inquiry 11, 679-708.

Higginbotham, J. (1983), "Logical Form, Binding and Nominals," Linguistic Inquiry 14, 395-420.

Higginbotham, J. (1985), "On Semantics," Linguistic Inquiry 16, 547-594.

Higginbotham, J. (1986), "Elucidations of Meaning," ms., MIT.

Hornstein, N. (1984), Logic as Grammar, MIT Press.

Huang, C.-T. J. (1982), Logical Relations in Chinese and the Theory of Grammar, MIT Ph.D. dissertation.

Huang, C.-T. J. (1984), "On the Distribution and Reference of Empty Pronouns," Linguistic Inquiry 15, 531-574.

Hudson, R. (1984), "Multiple (Alias 'Parasitic') Gaps," ms., University College London.

Jaeggli, O. (1981), Topics in Romance Syntax, Foris.

Johnson, K. (1987), "Temporal Prepositions, Clausal Gerunds and the ECP," ms., UC/Irvine.

Kajita, M. (1972), "Transformationally Underivable Pseudo-cleft Sentences," Studies in English Linguistics 3, 34-66.

Kayne, R. (1975), French Syntax: The Transformational Cycle, MIT Press.

Kayne, R. (1981), "ECP Extensions," Linguistic Inquiry 12, 93-133.

Kayne, R. (1983), "Connectedness," Linguistic Inquiry 14, 223-250.

Kearney, K. (1983), "Governing Categories," ms., Univ. of Conn.

Kegl, J. (1984), Locative Relations in American Sign Language, Ph.D. dissertation, MIT.

Keyser, S. J. (1978), Recent Transformational Studies in European Languages, MIT Press.

Kimball, J. (1971), "Super Equi-NP Deletion as Dative Deletion," in Papers from the Seventh Regional Meeting of the Chicago Linguistic Society, 142-148.

Kirkpatrick, C. (1982), "The Transitive Purpose Cluase in English," Texas Linguistic Forum 19.

Koopman, H. & D. Sportiche. (1982), "Variables and the Bijection Principle," The Linguistic Review 2, 139-160.

Koopman, H. & D. Sportiche. (1986a), "A Note on Long Extraction in Vata and the ECP," Natural Language and Linguistic Theory 4, 357-374.

Koopman, H. & D. Sportiche. (1986b), "θ-Theory and Extraction," talk given at UQAM.

Larson, R. (1984), "Extraction and Multiple Selection in PP," ms., MIT.

Larson, R. (1985), "Bare-NP Adverbs," Linguistic Inquiry 16, 594-622.

Larson, R. (1987), "Missing Prepositions" and the Analysis of English Free Relative Clauses," Linguistic Inquiry 18, 239-266.

Lasnik, H. & R. Fiengo. (1974), "Complement Object Deletion," Linguistic Inquiry 5, 535-571.

Lasnik, H. & Saito, M. (1984), "On the Nature of Proper Government," Linguistic Inquiry 15, 235-289.

Lasnik, H. & Saito, M. (forthcoming) Move α, MIT Press.

Lebeaux, D. (1984), "Anaphoric Binding and the Definition of PRO," Proceedings of NELS 14, C. Jones & P. Sells, eds., GLSA.

Lees, R.B. (1961),

Levin, J. (1983), "Government Relations and the Structure of INFL," MIT Working Papers inLinguistics, Volume 5.

Levin, J. (1984), "Government Relations and the Distribution of Empty Operators," NELS 14.

Longobardi, G. (1984), "Connectedness and Island Constraints," in Guéron et al.

Longobardi, G. (1985), "Connectedness, Scope and C-command," Linguistic Inquiry 16, 163-192.

Longobardi, G. (1986), "In Defense of the 'Correspondence Hypothesis': Island Effects and Parasitic COnstructions in Logical Form," ms., Scuola Normale Superiore.

Longobardi, G. (forthcoming), Movement, Scope and Island Constraints.

Lumsden, J. (in progress), MIT Ph. D. dissertation.

May, R. & Koster, J., eds. (1981), Levels of Syntactic Representation, Foris.

McNulty, E. (in progress), UConn Ph.D dissertation.

Nishigauchi, T. (1984) "Control and the Thematic Domain," Language 60, 215-250.

Obenauer, H.-G. (1985), "Connectedness, Variables, and Stylistic Inversion in French," in Guéron, et al., eds.

Obenauer, H.-G. (1984), "On the Identification of Empty Categories," The Linguistic Review 4, 153-202.

Partee, B. (1975), "Montague Grammar and Transformational Grammar," Linguistic Inquiry 6, 203-300.

Pesetsky, D. (1982), Paths and Categories, MIT Ph.D. dissertation.

Pollock, J.-Y. (1985), "On Case and the Syntax of Infinitives in French," in Guéron et al., eds.

Postal, P. (1972),

Ritter, E. (1986), MIT Generals Paper.

Rizzi, L. (1982), Issues in Italian Syntax, Foris.

Rizzi, L. (1982), "On Chain Formation," to appear in Syntax and Semantics, Academic Press.

Rizzi, L. (1986), "Null Objects in Italian and the Theory of pro," Linguistic Inquiry 17, 501-558.

Roeper, T. (1985), "Implicit Arguments and the Head-Complement Relation," ms., UMass/Amherst.

Ross, J. R. (1967), Constraints on Variables in Syntax, MIT Ph.D. dissertation.

Rothstein, S. (1983), The Syntactic Forms of Predication, MIT Ph.D. dissertation.

Rouveret, A. (1978), "Result Clauses and Conditions on Rules," in Keyser, ed.

Saddy (in progress), MIT Ph.D. dissertation.

Safir, K. (1984), "Multiple Variable Binding," Linguistic Inquiry 15, 603-674.

Safir, K. (1986a), "Relative Clauses in a Theory of Binding and Levels," Linguistic Inquiry 17, 663-690.

Safir, K. (1986b), "The Anti-C-Command Condition on Parasitic Gaps Revisited," ms. Rutgers.

Saito, M. (1985), Some Asymmetries in Japanese and Their Theoretical Implications, MIT Ph.D. dissertation.

Schachter, P. (1973), "Focus and Relativization," Language 49.

Shlonsky, U. (1987), Null and Displaced Subjects, MIT Ph.D. dissertation.

Speas, M. (1986), Adjunctions and Projections in Syntax, MIT Ph.D. dissertation.

Speas, M. & Fukui, N. (1985), "Specifiers and Projection," MIT Working Papers in Linguistics 8.

Sportiche, D. (1983), Structural Invariance and Symmetry in Syntax, Ph.D. dissertation, MIT.

Stockwell, R., P. Schachter & B. Partee. (1968/73), The Major Syntactic Structures of English, Holt, Rinehart & Winston.

Stowell, T. (1985a), "Null Operators and the Theory of Proper Government," ms., UCLA.

Stowell, T. (1985b), "Licensing Conditions on Null Operators."

Stowell, T. (1981), Origins of Phrase Structure, Ph.D. dissertation, MIT.

Taraldsen, T. (1979), "The Theoretical Implications of a Class of Marked Extractions," in Belletti et al, eds.

Torrego, E. (1986), "On Empty Categories in Nominals," ms., MIT.

Travis, L. (1984), Parameters and Effects of Word Order Variation, MIT Ph.D. dissertation.

van Riemsdijk, H. (1978), A Case Study in Syntactic Markedness, Foris.

Vergnaud, J.-R. (1974), French Relative Clauses, MIT Ph. D. dissertation.

Waksler, R. (1984) "A syntactic Analysis of the Object Gap in Purpose Clauses," West Coast Conference on Formal Linguistics 4.

Williams, E. (1980), "Predication," Linguistic Inquiry 11, 203-238.

Williams, E. (1981), "Argument Structure and Morphology," The Linguistic Review 1, 81-114.

Williams, E. (1983), "Against Small Clauses," Linguistic Inquiry 14, 287-308.

Williams, E. (1984), "Grammatical Relations," Linguistic Inquiry 15, 639-674.

Williams, E. (1986), "NP Trace in Theta Theory," ms., UMass-Amherst.

Williams, E. (1987), article in Natural Language and Linguistic Theory.

Woolford, E. (1981), "Control of Wh and Coindexing Chains: Agreement, Reflexive and Wh-Deletion in Clefts and Relatives," ms.