

An Inquiry into Minimalist Phrase Structure

by

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Abstract

This thesis takes as its starting point the proposal in Kayne (1994) that all syntactic structures are underlyingly spec-head-complement, and that they are right-branching. I will investigate this proposal taking data from English degree constructions, namely result clauses and comparatives. A comparison will be made between these constructions and English VPs, on which the majority of the phrase structure debate in the literature has been based. The evidence for left-branching and for right-branching in VPs will be considered, and similar evidence sought for degree constructions. We will see that VPs have a mostly right-branching structure, although left-branching structures are required in restricted circumstances. Also reason and manner adjuncts are argued to be right-adjoined to the VP node, a conclusion that is re-inforced by considering the constituency of VP adjuncts and some PP sequences noted by Jackendoff (1973). In degree constructions too, we argue that both left-branching and right-branching structures are necessary. My conclusion will be that Kayne's proposal is too strong, even though it is ideal from the perspective of a minimalist approach to syntax.

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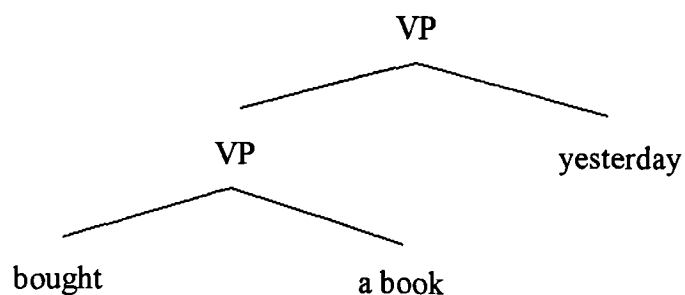
CHAPTER 1

INTRODUCTION TO THE THESIS

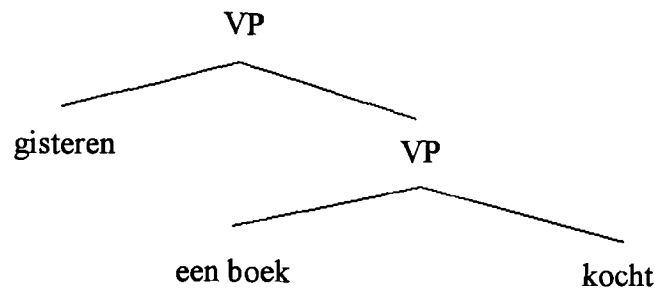
1.1 Phrase structure and word order

In GB Theory, constituent structure did not directly encode word order, cf. Chomsky (1981), Stowell (1981). The linear order of lexical items was independently fixed by parameters. Crucially, the c-command relations between, say, a verb and direct object would be the same no matter what value was chosen for the head parameter. Thus, the VPs in SVO and SOV languages would be mirror images. Consider the c-command relations between the direct object and a VP adverbial for the English and Dutch clauses below:

- (1) a. ...that John [bought a book yesterday].
b.



- (2) a. ...dat Jan [gisteren een boek kocht].
 b.



In both (1b) and (2b), the temporal adverbial asymmetrically c-commands the direct object.

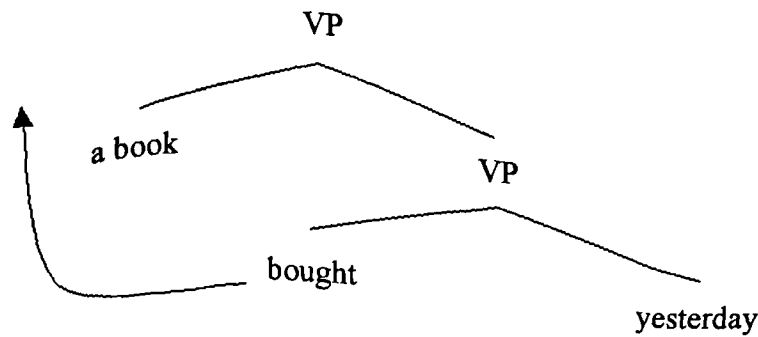
Contrary to this view, Kayne (1994) has proposed that there is an axiomatic relationship between phrase structure and word order. The asymmetric c-command relations encoded in a tree determine the linear ordering of the terminals in that tree: this is the Linear Correspondence Axiom¹. Mirror image orderings of terminal nodes will have radically different structures with different c-command relations between the nodes in the respective phrase markers. Kayne argues that syntactic structures are always right-branching, and that phrases all have the underlying order spec-head-complement². Consider the English and Dutch examples from (1a) and (2a) from the point of view of Kayne's approach:

¹ (i) *Linear Correspondence Axiom (LCA)* Kayne (1994: 6)
 $d(A)$ is a linear ordering of T .

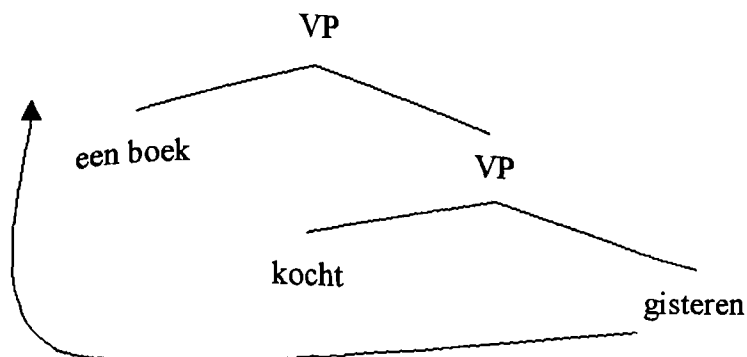
Taking T (the set of terminal nodes in a phrase marker), A refers to ordered pairs of non-terminal nodes in that phrase marker where the first asymmetrically c-commands the second. $d(A)$ is the *image* of these ordered pairs, i.e. the terminals dominated by each pair. So if an ordered pair $\langle A, B \rangle$ is present, every terminal dominated by A will precede every terminal dominated by B .

² The notion of Specifier is subsumed under that of adjunction. Kayne concludes that language variation is similarly a reflex of how much overt movement there is from the underlying SVO and spec-head-complement orders. As expected, those orders that require least movement, namely SVO and SOV are the most widely attested orders. Considerations of learnability suggest that Kayne's approach is to be preferred. Since the LCA radically restricts the number of possible structures a string of words can have, language learners will only have a restricted number of structures to consider.

(3) a. *English*



b. *Dutch*



After Spell-out, *a book* asymmetrically c-commands *yesterday* in (3a), contrary to the situation in (1b). The Dutch (3b) parallels (2b) in having *gisteren* asymmetrically c-commanding *een boek* on the surface. Such an approach to word order is the basis of minimalist theories of syntax.

The majority of work on phrase structure, and in particular work addressing the question of whether phrases are left-branching or right-branching, has focussed on VPs. We will consider English degree constructions from such a perspective in this thesis. Some typical examples of these constructions are given in (4):

- (4) a. John was so cold/cold enough [that he started shivering].
 b. John was too cold [to move]/cold enough [to start shivering].

- c. John was more/less cold [than Bill]/colder [than Bill].
- d. John was as cold [as Bill].

Pre-minimalist analyses of degree constructions tended towards left-branching, adjunction structures, cf. Bresnan (1973), Bowers (1975), Jackendoff (1977) and Larson (1988b). However, some authors have recently proposed LCA-compatible, right-branching structures, cf. Larson (1991), Izvorski (1995) and White (1997, 1998). It is the purpose of this thesis to investigate whether such a move is justified. Since the argumentation in the structural debate on VPs is crucial, we should consider some of the evidence in favour of left-branching and right-branching structures for them, before we consider degree constructions.

1.2 The structural debate in the Verb Phrase domain

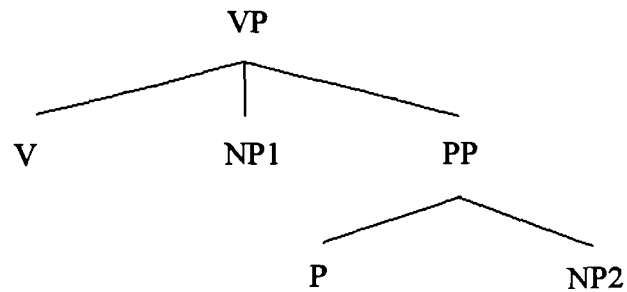
1.2.1 Evidence for left-branching and evidence for right-branching

The debate over the structure of English VPs has focussed in particular on the dative/double object alternation:

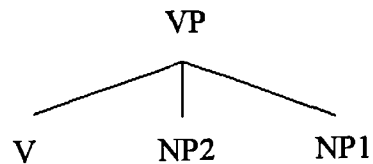
- (5) a. John gave flowers to Mary.
- b. John gave Mary flowers.

The first proposed structures for (5) were ternary-branching:

(6) a.

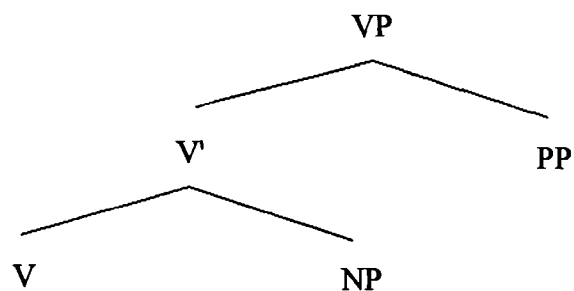


b.



Since the work of Kayne (1984), however, such analyses have been widely rejected in favour of binary branching structures, although not universally³. Two divergent views about the correct analysis of (5) have since emerged, one of which is the left-branching structure in (7) for the dative:

(7)



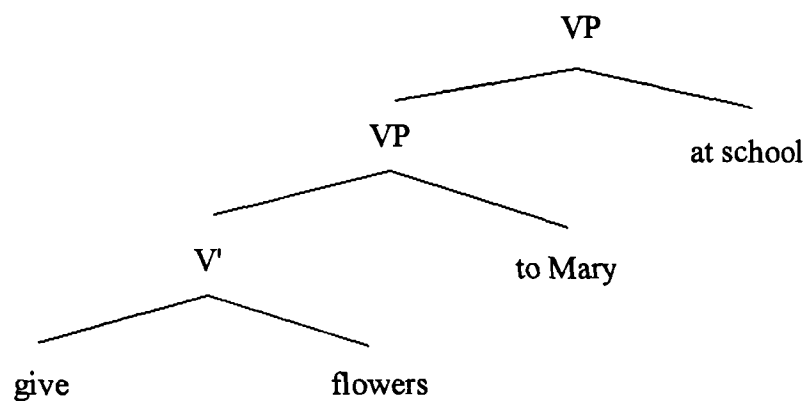
Evidence favouring (7) may be found in the following Partial VP Fronting data:

³ Brody (1994) and Yang (1999) have recently proposed the re-introduction of ternary branching into the minimalist program.

- (8) I said I would give flowers to Mary at school, and [give flowers to Mary] I did [at school].

Consider the left-branching structure suggested by (8) in (9):

(9)



Give flowers to Mary is a constituent in (9), and so we predict that (8) above should be possible.

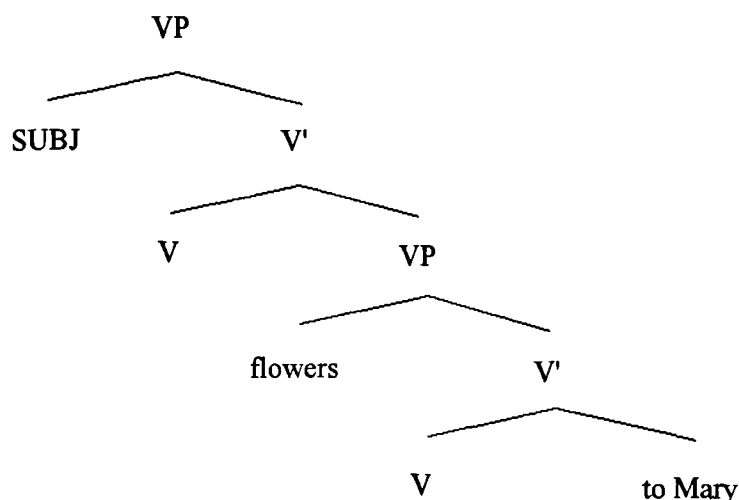
In a highly influential paper, Larson (1988a) argued against (7) and (9) and for a right-branching structure. He cited evidence from Barss and Lasnik (1986) which indicated that the linearly first argument of *gave* asymmetrically c-commanded the second. Let us just examine for now the following cases of Negative Polarity Item Licensing from Larson (1988a: 337-338):

- (10) a. I sent no presents to any of the children.
 b. *I sent any of the presents to none of the children.

- (11) a. I showed no one anything.
 b. *I showed anyone nothing.

Larson proposed that the internal arguments of a verb are base-generated within its projection at D-structure, and the verb then moves to a higher projection to license the subject. The structure formed in (12) is called a VP shell³:

(12)



The double object alternation is derived from (12) by a passivization-like operation.

The indirect object *Mary* replaces the PP, which then raises to the specifier position of the lower VP. This position is empty, as the direct object has been demoted to adjunct

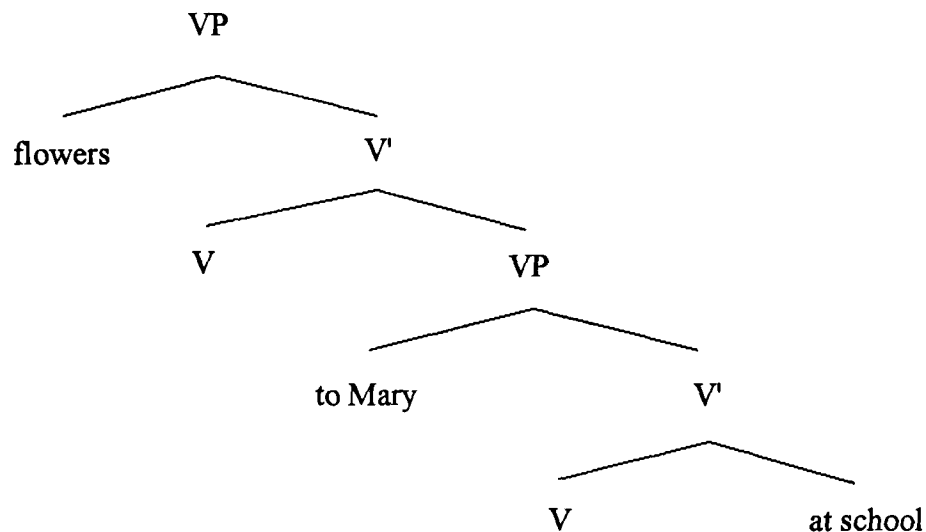
³ There are a number of conceptual questions with Larson's approach, which I will set out here, relating to the fact that the subject is licensed by verb raising. Pesetsky (1995) argued that this method of licensing the subject entails a rejection of Chomsky's (1981) view that D-structure is the level where all thematic roles have to be satisfied: this is also a problem for Bowers' (1993) version of VP structure, where the upper VP in (12) is a functional category, a Pr(edication) P(hrase).

Larson also proposes that the upper VP is merged as an empty head with no independent categorial features which only becomes a VP after the lower verb has raised to adjoin to it. This is akin to self-attachment, an operation rejected in Principles and Parameters and minimalist syntax as violating the generalisation that heads may only project in their base-generated position, but cf. Neeleman and Weerman (1993) for a contrary view.

status. Such an approach to multi-argument verbs has become commonplace within the Principles and Parameters and Minimalist frameworks.

However, (12) cannot deal with the constituency data from (8) which suggests a left-branching structure for the VP. Consider the base-generated shell for (13a) in (13b) below, which takes on Larson's (1988a: 345-346, fn.11) suggestion that adjuncts like *at school* are attached lower than arguments within the shell:

- (13) a. I gave flowers to Mary at school.
b.



However, structure (13b) incorrectly predicts the ungrammaticality of (8), repeated:

- (8) I said I would give flowers to Mary at school, and [give flowers to
Mary] I did [at school].

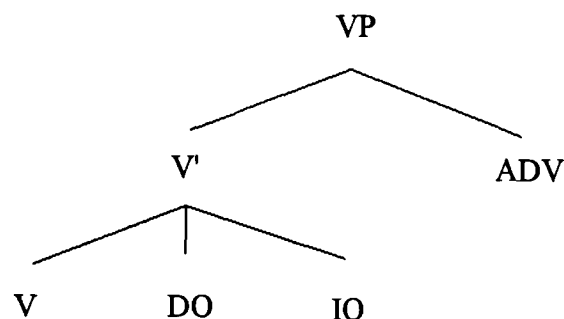
Hale and Keyser (1993) - and also Chomsky (1993, 1995) - argue that the outer VP has the status of a causative verb. It expresses the agentivity of the subject, which causes the event encoded in the inner VP to take place.

In order for (8) to be possible, *give flowers to Mary* must be a constituent which excludes *at school*. This is not the case in (13b). On the other hand, the left-branching structure (9) does not capture the c-command evidence for right-branching in (10)-(11). It is this contradiction between the evidence for left-branching in (8) and that for right-branching in (10)-(11) which has concerned researchers. Two proposed solutions are considered below.

1.2.2 Two approaches to the contradiction

Pesetsky's (1995) response to the problem with right-branching structures just discussed was to propose that every sentence has two independently generated structures. One is a right-branching Cascade structure like Larson's (12), which accounts for the c-command data in (10) and (11). The other is a left-branching Layered structure, depicted in (14) below, which derives constituency data such as (8):

(14)



Although this approach is descriptively adequate, one may question the motivation of such a complication to the theory of phrase structure.

Phillips (1996) rejects Pesetsky's dual representation approach for just this reason: the simplest and hence preferred theory assumes that just a single representation is generated for every sentence. His strongest argument that this is a right-branching structure is that, even in sentences such as (8) which appear to present incontrovertible evidence for left-branching, one may also find evidence for right-branching, a point also noted by Pesetsky. Let us consider the following:

(15) *I told him_i about John_i's results.

Principle C is violated in (15), which indicates that *him* c-commands into the PP. One would expect this effect to be nullified in the Partial VP Fronting environment, since, when the sub-constituent of VP containing the direct object but not the PP is fronted, *him* should not be able to c-command *John*. However this is not the case:

(16) *[Tell him_i] I did [about John_i's results].

Thus, Phillips argues that the structure underlying the Partial VP Fronting data in (8) and (16) should be right-branching. He proposes that syntax is derived top-down and from left-to-right under a principle called *Merge Right*, (17), which is constrained by the economy metric *Branch Right* in (18):

(17) *Merge Right* (Phillips 1996: 24)

New items must be attached at the right edge of a structure.

(18) *Branch Right* (Phillips 1996: 29)

Metric: select the most right-branching available attachment of an incoming item.

Reference set: all attachments of a new item that are compatible with a given interpretation.

Let us consider how Phillips derives the Principle C violation in the simple declarative (15). Concentrating on the VP, *told* and *him* are merged in a complement relation:

(19) [VP told [DP him]].

Next, the PP will be merged with (19). It is licensed in Phillips' VP shell-like structure by copying *told*, and merging that with (19). Then *him* is restructured as the specifier of the lower copy, a position from which it ends up c-commanding anything to its right. Finally, the *about*-phrase is merged as the complement of the copy of *told*:

(20) [VP told [VP [DP him] told [PP about John's results]]].

Since *him* c-commands *John* in (20), co-indexing them will be impossible, as we saw in (15).

Let us now turn to (16), where Principle C is still violated in the Partial VP Fronting environment. The structure after merging the fronted VP with *I did* is:

(21) [IP [VP Tell [DP him]] [IP I did]].

The adjoined VP is a constituent, therefore it can be copied, and merged as the complement of *did* in (21). This licenses the "movement" of the predicate:

(22) [IP [VP Tell [DP him]] [IP I did [_{VP} tell [_{DP} him]]]].

The rest of the structure is generated in the same way as (15). Crucially, since *him* has already been licensed as an argument of *tell* in the fronted VP, it and *tell* do not have to remain as a constituent throughout the derivation. *Him* in the lower copy of *tell him* may therefore be restructured to a position from which it can c-command *John*:

(23) [IP [VP Tell [DP him]] [IP I did [_{VP} tell [_{VP} [_{DP} him] tell [_{PP} about John's results]]]]].

In this way, Phillips' analysis succeeds in resolving the conflict between the evidence for right-branching (from the c-command relationship between *him* and *John*) and the evidence for left-branching (from Partial VP Fronting).

Phillips, though, does argue that a left-branching VP structure may be necessary in restricted circumstances. Consider the following pair of examples:

- (24) a. John kissed Mary many times intentionally.
b. John kissed Mary intentionally many times.

If we focus on the scope relations between the adverbials, these examples are a problem for a right-branching approach to VP structure. (24a) is ambiguous between a reading where there are many instances of intentional kisses and one where there is one intentional case of many kisses. (24b), on the other hand, only has the reading where there are many instances of intentional kisses. Consider a right-branching structure for (24a) to see the problem:

(25) [VP kissed [VP [Mary] kissed [VP [many times] kissed [intentionally]]]].

Even if the quantifier *many times* were to raise covertly, *intentionally* cannot take scope over it. Therefore we expect (24a) to be unambiguous, contrary to fact. The opposite is true of (24b). Phillips argues that his *Branch Right* metric does not rule out left-branching structures per se, if such a structure encodes a different interpretation to that encoded in the corresponding right-branching one. Compare the left-branching (26) with (25):

(26) [VP [VP [kissed [Mary]] [many times]] [intentionally]].

While (25) allows *many times* to take scope over *intentionally*, (26) allows the opposite reading with *intentionally* taking scope over *many times*. Thus (26) may be generated under Phillips' system.

The structural debate in the VP domain will be discussed in detail at the start of each of the next two chapters. The conclusion I come to is that Phillips' approach is on balance the best one to take. It must be said that there are still some residual problems it cannot deal with, but it does resolve the important contradiction between

the evidence for left-branching and that for right-branching in a conceptually neat way. The fact that I adopt a theory of VP structure where both left-branching and right-branching structures may be generated itself entails a rejection of Kayne's (1994) approach to phrase structure. Let us now turn to degree constructions, and consider what structures have been proposed for them.

1.3 The structural debate in the degree construction domain

While lexical categories like verbs have been assumed to fully project into phrases, functional categories like Degree were assumed at first to be exocentric, that is, they did not project. Consider the following structure:

(27) [S [NP N] I [VP V]].

Both the noun and verb project phrases in (27), but inflection (I) does not. Since Chomsky (1986), though, this view has been rejected, and functional categories too have been assumed to conform to the X'-schemata, resulting in the structure in (28) for clauses:

(28) [IP [NP N] [I' I [VP V]]].

I projects into IP which is the equivalent of S in (27). Abney (1987: 54f.) proposed that, like lexical categories, functional categories have selectional properties. Lexical categories describe particular events or classes of objects, and have what he terms

thematic properties, a notion which subsumes θ -marking and the selection of adjuncts. The defining property of their selectees is that they denote classes of objects. Functional categories on the other hand do not describe particular entities, events or properties accorded to entities, but encode relations involving these entities, etc. Consider the case of I in (28) which selects the predicate VP. Following Higginbotham (1985) we may say that I binds the Event θ -role in V's lexical entry.

Consider the following evidence which suggests that the degree word selects the comparative phrase and result clause (when I refer to result clauses and the *than-/as*-phrase of comparatives, I henceforth use the term *degree satellite*, following Doetjes, Neeleman and van de Koot 1998):

- (29) a. John was *(so) cold/cold *(enough) [that he started shivering].
 b. John was *(too) cold [to move]/cold *(enough) [to start shivering].
 c. John was *(more/less) cold [than Bill]/*(colder) [than Bill].
 d. John was *(as) cold [as Bill].

In each of these cases (I will focus on cases involving predicative adjectives where possible throughout the thesis), one may suggest that the degree word has licensed the presence of the satellite. The relational nature of the degree head is made apparent when we consider its semantics. For the comparatives in (29c,d), the degree head specifies how John's degree of coldness is greater/lesser than/as big as Bill's; while with the result clauses in (29a,b), the relation is that John's degree of coldness results in a particular event. Further evidence for selection may be found in the following contrasts:

- (30) a. John was so cold [that he started shivering]/*[to start shivering].
 b. John was too cold [to move]/*[that he couldn't move].
- (31) a. John was more/less cold/colder [than Bill]/*[as Bill].
 b. John was as cold [as Bill]/*[than Bill].

In the case of all degree items, except for *enough*, the degree head requires a particular syntactic form of the satellite, either a finite or non-finite result clause or a *than/as*-phrase for the comparative. Let us suppose that it is true that the degree head selects the satellite⁵.

Left-branching structures have been proposed by Bresnan (1973), Bowers (1975), Jackendoff (1977), Larson (1988b), Corver (1990) and Kennedy (1997). Right-branching structures have been proposed by Baltin (1987), Larson (1991), Kayne (1994), Izvorski (1995) and White (1997, 1998), and various authors have proposed co-ordination analyses. The battery of constituency and c-command tests that have been performed on VPs will be turned on degree constructions in Chapters 2 and 3 of this thesis, concluding that we have evidence for a right-branching structure for degree constructions. However, left-branching structures are necessary to encode their wide-scope reading. We will argue that the data are best accommodated in a Phillips-style approach to phrase structure. This result again undermines Kayne's (1994) strong hypothesis that syntactic structures are universally right-branching.

⁵ Abney adopts Pesetsky's (1982) terms *s-selection* to cover thematic selection by a lexical category and *c-selection* for selection by functional categories. Whether the evidence in (29)–(31) shows that the degree head c-selects the satellite, or that it s-selects it is a somewhat moot point. One may argue that comparative phrases are c-selected, since there are the two heads, *than* and *as*, to choose from. For result clauses, though, the conclusion is not so clear. We will see evidence in Chapter 2 that semantically finite result clauses are factives, i.e. they are presupposed. Therefore we may argue that there is a semantic basis in the tense value of the clause, say that factive clauses can only be finite. I will leave this issue to later research: I thank Ad Neeleman for pointing out this possibility to me.

1.4 Clustering

One final related issue to be examined concerns Jackendoff's (1973) observation that some PP sequences which semantically appear to form a unit behave like single constituents: I henceforth refer to this phenomenon as *clustering*. Consider the sentence below:

(32) I saw John *across the road from me*.

The italicised string in (32) appears to be a constituent, since it can be the focus of a cleft sentence:

(33) It was [across the road from me] that I saw John.

The PPs can also be fronted, as in:

(34) [Across the road from me] I saw John.

Consider (35) in comparison:

(35) I gave flowers *to John at 10.00*.

The PPs in (35) do not appear to form a constituent, since they cannot be the focus of a cleft sentence, (36), nor can they be fronted, (37):

(36) *It was [to John at 10.00] that I gave flowers.

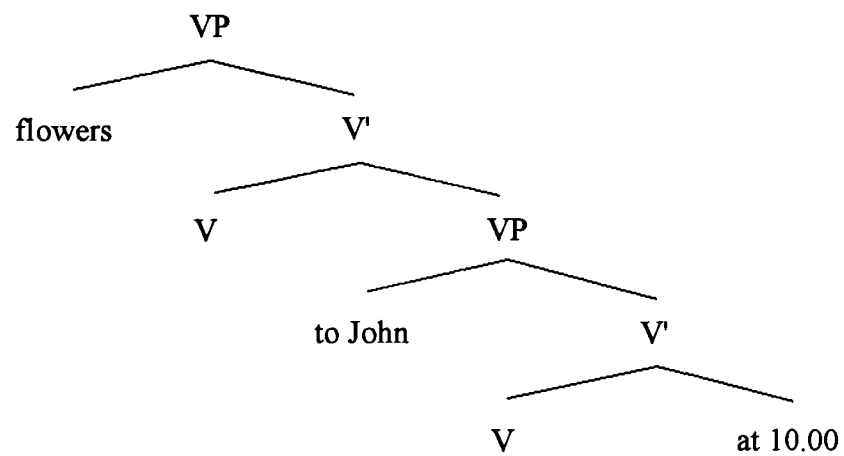
(37) *[To John at 10.00] I gave flowers.

The phenomenon illustrated in (35)-(37) has been cited by Pesetsky (1995) as evidence for his conception of the left-branching Layered structure shown in (14), where the dative and adjunct PPs do not form a constituent. Since the PPs in (32) are a semantic unit denoting a location, Pesetsky could argue that they are a constituent, thereby deriving (33) and (34). Now notice that clustering seems to generalise to adjunct sequences which semantically do not form a unit:

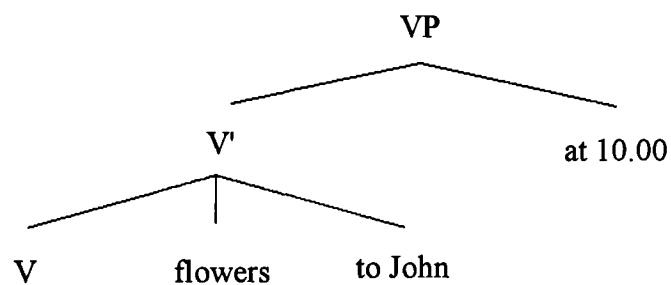
- (38) a. I gave flowers to John *at 10.00 in the garden*.
b. It was [at 10.00 in the garden] that I gave flowers to John.
c. [At 10.00 in the garden] I gave flowers to John.

The contrast between (32) and (38a) on the one hand and (35) on the other is of direct relevance to the debate on VP structure. Consider the right-branching and left-branching structures for the VP in (35):

(39) a.

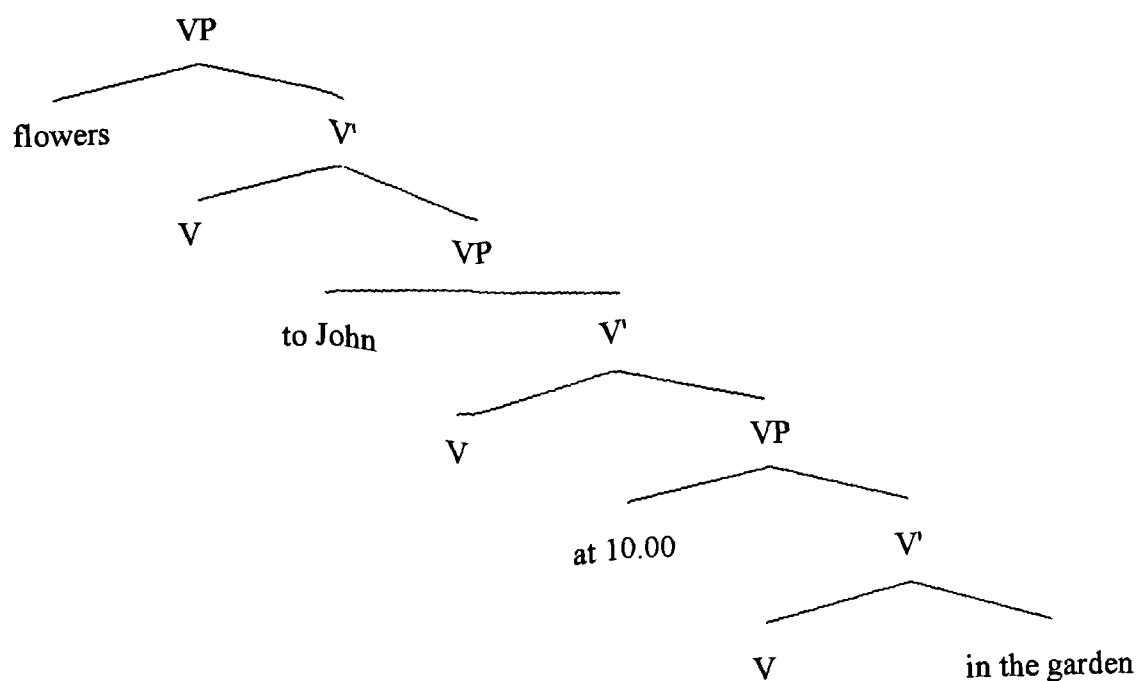


b.

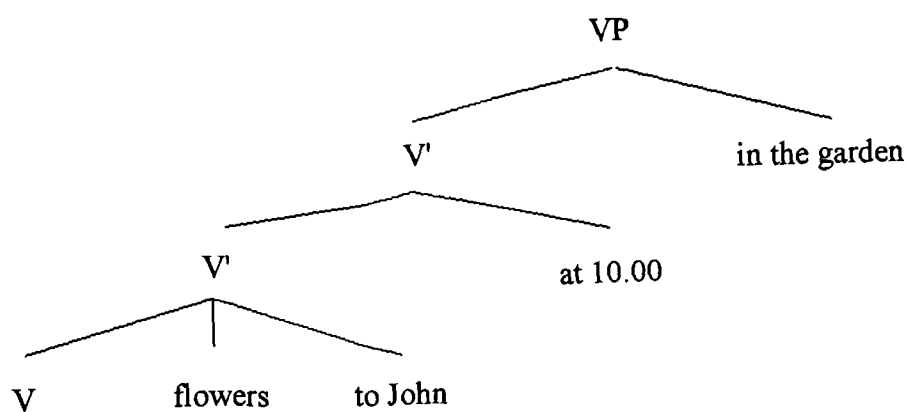


The left-branching structure correctly predicts (36) and (37) not to be correct, contrary to the right-branching one. In contrast, consider the left-branching and right-branching structures for (38a):

(40) a.



b.



The reverse conclusion may be made here, with the right-branching structure correctly ascribing constituent-hood to the PPs in (38a), which the left-branching structure does not do.

In Chapter 4, I argue that the apparent contradiction between (32) and (38a) on the one hand and (35) on the other can be resolved if we adopt a Phillips-style right-branching shell-like structure for PP clusters. This result further re-inforces the conclusion from Chapters 2 and 3 that VPs are mostly right-branching.

1.5 Overview of the thesis

Chapters 2 and 3 will consider the evidence for, respectively, left-branching and right-branching in English degree constructions. The first section in each chapter will look at the evidence from the VP domain. Having evaluated the VP data, similar evidence will be sought for degree constructions. In a number of cases, the conclusion to be drawn for the latter domain will be inconclusive, so further investigation will be necessary. The evidence for a right-branching structure for VPs seems compelling, and for degree constructions too. In a further twist, it is shown that degree constructions have a left-branching structure when they are associated with a wide-scope reading. This presents a serious problem for a strong minimalist theory of phrase structure like Kayne's (1994), which only admits right-branching structures.

Chapter 4 will be concerned with some PP sequences which seem to behave as constituents. I will consider in detail the structural properties of a number of sequences noted by Jackendoff (1973), providing further evidence that both right-branching and left-branching structures under a Phillips (1996)-style derivation are justified for VPs.

Chapter 5 will conclude the discussion.

CHAPTER 2

EVIDENCE FOR LEFT-BRANCHING IN ENGLISH DEGREE CONSTRUCTIONS

2.0 Introduction

In this chapter, we consider what evidence there is in favour of a left-branching structure for English degree constructions. The evidence will be both syntactic and semantic, in line with that cited in favour of left-branching in English VPs. Syntactic constituency tests which have been proposed for VPs, and which suggest a left-branching structure, comprise Partial VP Fronting, Cleft and Pseudo-cleft sentence, Substitution and VP Ellipsis environments. Chomsky (1980) and Larson (1988a) also noted some evidence of a semantic nature, namely that in the double object construction the verb and indirect object could encode an idiomatic interpretation. On the basis of this, Chomsky proposed that these should be a constituent in a left-branching VP which excludes the direct object.

Semantic evidence for left-branching can also be found for degree constructions, which focuses on the interpretation of the degree satellite. In some multi-clause environments, a satellite associated with a degree expression in an embedded clause may be compared with, or may be the result of, the matrix clause. It has been argued that the satellite is right-adjoined to the matrix clause in such cases. When the degree expression takes scope over just the embedded clause, the satellite may be right-adjoined to that clause, or may remain within the degree word's or

adjective's projection. Each of these possibilities will be considered. Syntactic evidence for left-branching similar to that for VPs can be found in Partial Predicate Fronting, Cleft and Pseudo-cleft sentence, Substitution and Predicate Ellipsis environments.

The overall conclusion of this chapter will be that evidence does exist for a left-branching structure for both English VPs and degree constructions. It remains to be seen, however, to what extent such evidence can be accommodated in a right-branching structure, a question which will be addressed in Chapter 3.

The first section will set out the evidence for left-branching in the VP domain. Similar evidence will then be sought for degree constructions in §2.2, with the results summarised in §2.3.

2.1 Evidence for left-branching in Verb Phrases

2.1.1 Semantic evidence

Chomsky (1980) and Larson (1988a) provide semantic evidence suggesting that a verb and dative PP may encode an idiomatic interpretation. Consider the following (Larson 1988a: 340):

- (1) a. Beethoven gave the Fifth Symphony to the world.
- b. Beethoven gave the Fifth Symphony to his patron.

There is a significant difference between giving an object to the world and giving one to a patron. (1a) may be read as "Beethoven composed the Fifth Symphony". In other

words, the event of giving is not literally one of handing something over. With (1b), there is a physical transfer of the music score from Beethoven to his patron. Further idiomatic constructions involving datives are given below (Larson 1988a: 340):

- (2) a. Mary took Felix to the cleaners.
- b. Felix threw Oscar to the wolves.

In view of this evidence, Chomsky suggests that the verb and indirect object should be treated as a constituent which excludes the direct object. The latter is then assigned its θ -role compositionally by this constituent in the left-branching structures in (3):

- (3) a. John [_{VP} [_V gave Bill] a book].
- b. John [_{VP} [_V gave to Bill] a book].

The surface order of the string in the dative (3b) is derived by extraposing the PP around *a book*:

- (4) John [_{VP} [_{VP} [_V gave t_i] a book] [to Bill]_i].

Although I accept the observation that the verb and indirect object form an idiom, Chomsky's derivation of the dative makes incorrect predictions with respect to the possibility of extraction out of the PP. Consider the following:

- (5) Who did John give a book [to t]?

An extraposed constituent like *to Bill* in (4) should be an island just like the *of*-PP in (6b), cf. Guéron (1980):

- (6) a. Who did you see [a picture of *t*] yesterday?
b. *Who did you see [a picture] yesterday [of *t*]?

It would seem, then, that the dative PP in (5) has not been extraposed, and that this part of Chomsky's proposal must be rejected. In a further twist, Larson (1988a) has shown that the semantic observation encoded in (3) can also be captured in a right-branching structure, cf. Chapter 3. Naturally, this reduces the significance of such evidence for a left-branching structure for VPs.

2.1.2 Partial VP Fronting

Partially fronting a VP will give clues as to its constituency. Let us consider the example below:

- (7) John saw Bill at school on Tuesday at 10.00.

The data in (8) results from fronting the VP in (7):

- (8) a. John said he would see Bill at school on Tuesday at 10.00,
and [see Bill at school on Tuesday at 10.00] John did.

- b. John said he would see Bill at school on Tuesday at 10.00,
and [see Bill at school on Tuesday] John did [at 10.00].
- c. John said he would see Bill at school on Tuesday at 10.00, and
[see Bill at school] John did [on Tuesday] [at 10.00].
- d. John said he would see Bill at school on Tuesday at 10.00, and
[see Bill] John did [at school] [on Tuesday] [at 10.00].
- e. *John said he would see Bill at school on Tuesday at 10.00, and [see]
John did [Bill] [at school] [on Tuesday] [at 10.00].

The left-branching structure in (9) will derive this data, since each bracketed constituent there can be fronted:

- (9) [[[[saw Bill] at school] on Tuesday] at 10.00].

Thus we may make the preliminary conclusion that (8) favours (9). We will see in Chapter 3, though, that Phillips (1996) has proposed right-branching structures which can accommodate Partial VP Fronting data, given some additional assumptions about how syntactic structures are derived.

2.1.3 Cleft and Pseudo-cleft sentences

There are two types of cleft sentence to consider, namely standard Cleft sentences and Pseudo-clefts. Let us look at the Cleft sentence data first of all based on (7):

- (10) a. It was [see Bill at school on Tuesday at 10.00] that John did.
 b. It was [see Bill at school on Tuesday] that John did [at 10.00].
 c. It was [see Bill at school] that John did [on Tuesday] [at 10.00].
 d. It was [see Bill] that John did [at school] [on Tuesday] [at 10.00].
 e. *It was [see] that John did [Bill] [at school] [on Tuesday] [at 10.00].

The data in (10) supports (9), since each constituent shown can be focussed:

- (9) [[[[saw Bill] at school] on Tuesday] at 10.00].

The Pseudo-cleft data, which seems more natural, are given below:

- (11) a. What John did was [see Bill at school on Tuesday at 10.00].
 b. What John did [at 10.00] was [see Bill at school on Tuesday].
 c. What John did [on Tuesday] [at 10.00] was [see Bill at school].
 d. What John did [at school] [on Tuesday] [at 10.00] was [see Bill].
 e. *What John did [Bill] [at school] [on Tuesday] [at 10.00] was [see].

Pseudo-cleft sentences also provide support for the left-branching constituency shown in (9).

2.1.4 Substitution and VP Ellipsis

So may substitute for an entire VP constituent, or for a sub-constituent of that VP¹. The following substitutions are allowed for the VP in (7):

- (12) a. John [saw Bill at school on Tuesday at 10.00], and Mary did [so] too.
b. John [saw Bill at school on Tuesday] [at 10.00], and Mary did [so] [at 11.00].
c. John [saw Bill at school] [on Tuesday] [at 10.00], and Mary did [so] [on Wednesday] [at 11.00].
d. John [saw Bill] [at school] [on Tuesday] [at 10.00], and Mary did [so] [at home] [on Wednesday] [at 11.00].
e. *John [saw Bill at school on Tuesday at 10.00], and Mary did [so] [Susan] [at home] [on Wednesday] [at 11.00].

The left-branching structure from above will admit these possibilities:

- (9) [[[[saw Bill] at school] on Tuesday] at 10.00].

So may substitute for each bracketed constituent in (9).

The same conclusion may be made for VP Ellipsis data. Consider the following which are based on (7):

¹ Jackendoff (1998: 75) argues that *so* need not correspond to a constituent. Consider the following based on Jackendoff's examples:

- (i) Mary put food in the fridge, then Susan did so with the beer.

There is no constituent in the first clause which *so* corresponds to in the second.

I acknowledge this to be correct, but point out that this data is unusual due to the presence of *with the beer*, and therefore I do not see it as relevant to the data in (12).

- (13) a. John [saw Bill at school on Tuesday at 10.00], and Mary did [] too.
- b. John [saw Bill at school on Tuesday] [at 10.00], and Mary did []
[at 11.00].
- c. John [saw Bill at school] [on Tuesday] [at 10.00], and Mary did []
[on Wednesday] [at 11.00].
- d. John [saw Bill] [at school] [on Tuesday] [at 10.00], and Mary did []
[at home] [on Wednesday] [at 11.00].
- e. *John [saw Bill at school on Tuesday at 10.00], and Mary did []
[Susan] [at home] [on Wednesday] [at 11.00].

The data in (13) also favours the structure in (9).

2.1.5 Summary of the test results

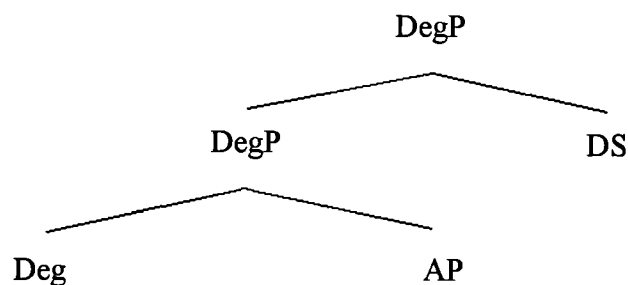
The five constituency tests, namely Partial VP Fronting, Cleft and Pseudo-cleft sentences, Substitution and VP Ellipsis, all appear to support the left-branching structure for VPs in (9). However, we have found the semantic evidence for such a structure wanting in two respects. First, the extraposition analysis incorrectly predicts the island-hood of the PP in the dative construction. Second, the relevant semantic observation can also be captured in a right-branching structure, as shown by Larson (1988a). Indeed, Phillips (1996) has argued that a right-branching structure can account for some of the syntactic data as well: Larson's and Phillips' proposals will be covered in Chapter 3. Let us now consider whether evidence for left-branching exists in degree constructions.

2.2 Evidence for left-branching in degree constructions

2.2.1 Degree satellites as predicate adjuncts

One view prevalent in the 1970s, and resurrected recently, was that degree satellites were adjuncts. This assumption formed the basis of a number of proposals. One was that the satellite was base-generated as an adjunct of the predicate, cf. Bowers (1975), Larson (1988b):

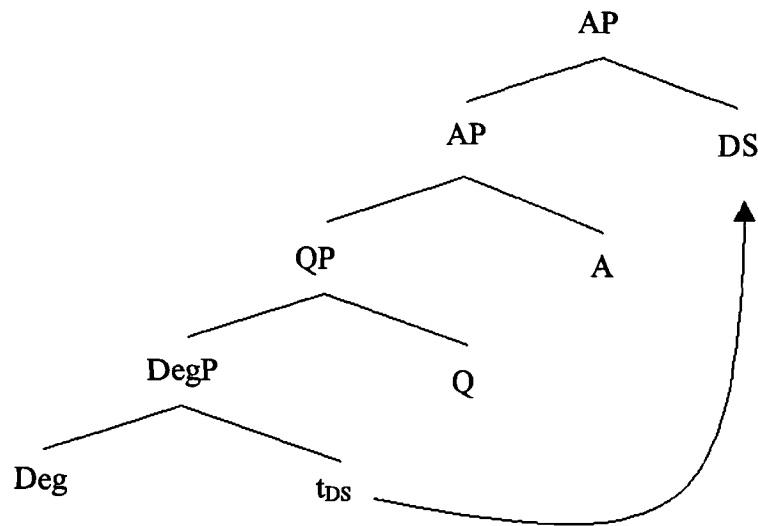
(14)



An alternative, proposed by Bresnan (1973) for comparatives, but which may easily be extended to result clauses, was that the satellite was base-generated as the sister of Deg^0 , and was subsequently extraposed to adjoin to the predicate¹:

¹ This discussion ignores a major issue in the structural debate on degree constructions, namely the internal structure of the adjective phrase. Bresnan (1973) argued, supported to some extent by Jackendoff (1977), that the degree word was in the specifier of the AP, as shown in (15). Abney (1987) and Corver (1990) argued that the degree word is a head selecting AP. For an approach which combines aspects of both of these analyses, see Doetjes, Neeleman and van de Koot (1998). I will remain neutral on this issue until the next section.

(15)



Note that adopting (14) would entail a rejection of our assumption in Chapter 1 that degree satellites are selected. Therefore, we hope to refute the proposal that they are adjuncts.

We saw in §2.1.1 that extraction out of an extraposed phrase is impossible. The relevant data are repeated here as (16):

- (16) a. Who did you see [a picture of t] yesterday?
 b. *Who did you see [a picture] yesterday [of t]?

The following data illustrating extraction out of a clausal comparative satellite supports the treatment of it as an adjunct:³

- (17) a. *What did John give flowers to more men [than Bill gave t to]?
 b. *What did John give flowers to as many men [as Bill gave t to]?

³ Wynn Chao (p.c.) suggests that the downgraded status of these cases could be due to a semantic parallelism requirement on comparatives, cf. Chapter 3 for details on this area. Extraction out of the matrix clause is slightly downgraded as well:

- (i) ?What did John give t to more men [than Bill gave chocolates to]?

- (18) a. *Who did John speak with Susan about more men [than Bill spoke with t about]?
- b. *Who did John speak with Susan about as many men [as Bill spoke with t about]?
- (19) a. *In what manner did John speak openly with Susan about more men [than Bill spoke t with Mary about]?
- b. *In what manner did John speak openly with Susan about as many men [as Bill spoke t with Mary about]?

This data suggests that comparative clauses are strong islands, since extraction of both arguments and adjuncts is impossible. We will also consider extraction data for another type of clausal comparative, namely subcomparatives⁴:

- (20) a. *What did John give flowers to more men [than Bill gave t to women]?
- b. *What did John give flowers to as many men [as Bill gave t to women]?
- (21) a. *Who did John speak with Susan about more men [than Bill spoke with t about women]?
- b. *Who did John speak with Susan about as many men [as Bill spoke with t about women]?

⁴ Subcomparatives differ from standard comparatives in having different properties being compared. Standard comparatives are interpreted by having the same predicate in the satellite as is in the main clause, cf. Larson (1988b) and Kennedy (1997) for details. The same point that was made in the previous footnote may be made here too, namely that a parallelism requirement could explain the downgraded status of these cases.

- (22) a. *In what manner did John speak openly with Susan about more men
[than Bill spoke t with Mary about women]?
- b. *In what manner did John speak openly with Susan about as many men
[as Bill spoke t with Mary about women]?

Neither arguments nor adjuncts may be extracted out of a subcomparative satellite either, which suggests that it is a strong island as well. Many authors including Larson (1988b), Kennedy (1997) and White (1998) have sought to explain these facts by arguing that the clauses contain a null operator which makes them a *wh*-island, and that they are selected by the degree word. This assumption does not, though, explain the strong ungrammaticality of argument extraction, since such extraction out of a *wh*-island would only trigger a weak Subjacency violation. (17)-(22) are best explained by saying that clausal comparatives are adjuncts².

Consider now the following:

- (23) a. Who did John run faster [than t]?
- b. Who did John run as fast [as t]?

In contrast with the clausal comparative phrases, extraction out of a nominal comparative phrase is grammatical. This suggests at first sight that nominal phrases differ from clausal ones in not being adjuncts. Hans van de Koot (p.c.) has suggested, though, that the grammaticality of (23) may be linked to the possibility in English of P-stranding an adjunct:

- (24) Which country do you live in t?

Compare this with Dutch, where extraction is impossible out of either the adjunct or comparative phrase:

- (25) a. *Welk land woon je in t?
Which country live you in
b. *Wie liep Jan sneller dan t?
Who runs Jan faster than

Thus, one may argue that both types of comparative satellite in English are adjuncts.

We may in fact reject structure (15) where the adjunct status of the satellite is due to it being extraposed. Overt movement processes are assumed in the Minimalist Program to be triggered by strong features. What feature could force a usually optional stylistic operation like extraposition to be obligatory is not at all clear. Therefore we should argue that the satellite is base-generated as an adjunct, which immediately forces us to reject in part our assumption in Chapter 1 that degree satellites are selected.

Turning now to result clauses, Corver (1990) and Kennedy (1997) argue that satellites are "selected adjuncts" with an adjoined structure like (14). Kennedy cites the case of *badly* in (26) as exhibiting "selected adjunct" status:

- (26) a. John behaved *(badly).
b. John worded his reply *(badly).

² It may still be necessary to have operator movement occurring satellite-internally for interpretative reasons, cf. Larson (1988b) and Kennedy (1997) among others.

We would not expect an adjunct to be obligatory as *badly* is in (26). It could only be a property of *behave* and *word* that a manner adverbial has to be present, and so they must have selected the adjunct. Consider now extraction data for the infinitival result clauses:

- (27) a. Who was John too angry to talk to t?
b. *How loudly was John too angry to talk to Mary t?
- (28) a. Who was John angry enough to shout at t?
b. *How loudly was John angry enough to shout at Mary t?

The selected status of infinitival result clauses is manifested by the argument extraction cases in (27a) and (28a), cf. clausal comparatives in contrast. Since adjunct extraction is impossible, Corver and Kennedy treat the clauses as adjuncts as well as selected clauses. One problem with this view is the fact that result clauses are optional:

- (29) a. John was too angry today.
b. John was angry enough today.

Since selected adjuncts are seen to be obligatory, (29) suggests that the result clauses licensed by *too* and *enough* in (27) and (28) are unlikely to be such adjuncts. In fact, there is a way of dealing with the *too* sentences in (27) without having to assume that the clause is an adjunct (I have nothing further to say about the *enough* sentences in (28)). As Linebarger (1980) and Rothstein (1991) point out, *too* is inherently negative

in meaning, and therefore can license a polarity item by itself. Compare it with *enough*, where an overt negative operator is required:

- (30) a. John was too angry (not) to talk to anyone.
b. John was angry enough *(not) to talk to anyone.

Negation has been seen in the literature to induce a weak (inner) island effect, ruling out adjunct (but not argument) extraction. Consider the following: (31b) and (32b) are from Manzini (1992: 110):

- (31) a. What do you think [Peter did t]?
b. What don't you think [Peter did t]?

(32) a. Why do you think [Peter left t]?
b. *Why don't you think [Peter left t]?

It is the negation which causes the island violation with adjunct movement in (32b), but this island is not strong enough to affect the argument in (31b). One may attribute the contrast in (27) to the same factor. Let us assume that such an island is the result of having a null operator within the satellite base-generated in Spec, CP:

- (33) John was too angry [Op to talk to anyone].

This operator then binds the Event θ -role of *talk* in (33), and forces a negative interpretation on the satellite (this operator is similar to that assumed to be present in

factive islands, see below⁶). Having such an operator requires that *too* select the satellite, a result we want given our assumptions in Chapter 1.

Consider now some data concerning extraction out of finite result clauses:

- (34) a. ?Who was John so angry that he shouted at t?
b. *How loudly was John so angry that he shouted at Mary t?
- (35) a. ?Who was John angry enough that he shouted at t?
b. *How loudly was John angry enough that he shouted at Mary t?

The downgraded status of these examples may also be attributed to an interpretative quirk of *so* and *enough*. White (1997: 331-332) noted that finite result clauses are semantically different from infinitival ones, in that they are presupposed:

- (36) *John was so cold that he started shivering, but he did not shiver.
(cf. John was too cold to move, but he did anyway)
- (37) *John was cold enough that he started shivering, but he did not shiver.
(cf. John was cold enough to start shivering, but he did not shiver)

⁶ Consider also the case of the degree clause construction below, cf. Browning (1987):

- (i) John was too angry to talk to.

Assuming with Browning that there is null operator movement from the complement position of *to*, we are forced to assume that there are two operators within the satellite clause:

- (ii) John was too angry [Op1 Op2 [to talk to t1]].

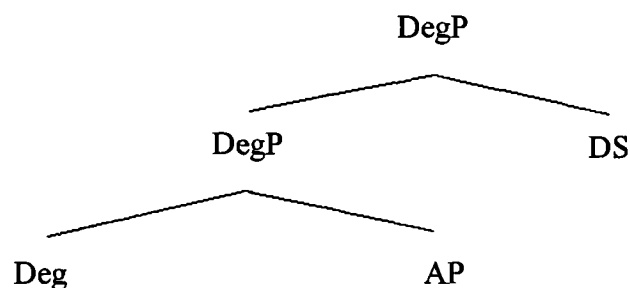
The negative operator is generated in C first, and Op1 moves later. Wynn Chao (p.c.) suggests that unselective binding might be a way to get round any problems of licensing t1.

- (38) a. Who did Joe believe [that Susan invited t]?
 b. ?Who did Fred reveal [that he had fired t]?
 (39) a. How did Bill believe [that Anne solved the problem t]?
 b. *How did Bill reveal [that Anne solved the problem t]?

While both argument and adjunct extraction from the complement of a bridge verb like *believe* is fully grammatical, adjunct extraction is impossible with a factive verb like *reveal*, (39b), and argument extraction is also downgraded, (38b). Melvold proposes that there is a null operator within the CP projection of the complement clause in (38)-(39), similar to the one I assumed for *too* in (33), and I adopt this view here. The operator binds the Event θ -role of the complement clause's verb. I therefore take the contrast in (34)-(35) as compatible with a selection-link between the degree word and finite result clause.

We may question how the extraction data for result clauses presented above may be accommodated in the left-branching structure in (14), repeated here:

(14)



One could argue that, instead of being an adjunct, the result clause is a specifier on the right of the Degree projection. How the clause could be selected when the degree word is a modifier will be considered in a later chapter.

We have seen that clausal and nominal comparative phrases exhibit the island properties attributed to adjuncts. We argued that this was due to the satellites being base-generated predicate adjuncts, a proposal which entailed a rejection of the assumption in Chapter 1 that all satellites are selected by the degree word. However, this data could equally be handled by adjoining the satellite to a clause, a possibility we will consider in the next section. The extraction data for result clauses was explained with reference to the semantic properties of the degree head, thus still allowing us to assume that the head selects the clause. *Too* was seen to be negative in meaning, and thus its satellite was an inner island, (27). Both finite result clauses were presupposed, and so were assumed to be factive islands, (33)-(34). We suggested that such data could be accommodated in a left-branching structure if the result clause were treated as a specifier on the right in (14). In the next section, I will examine another semantic property of degree words which may require a left-branching analysis, namely scope.

2.2.2 Degree satellites as clausal adjuncts

Dresher (1977) and Rouveret (1978) have argued that degree words take scope at LF, a point that has become central to theories detailing the semantics of such items. Consider the following:

(40) Mary believed Harry was so crazy that he acted irrationally.

One of the interpretations of (40) is the narrow-scope (41):

(41) Mary believes that Harry's degree of craziness caused him to act
irrationally.

The other is the wide-scope (42):

(42) Mary's belief that Harry was crazy to a high degree resulted in Harry
acting irrationally.

The ambiguity of (40) has been handled syntactically in a number of ways in the literature. For example, the result clause could be adjoined to either clausal node, followed by covert raising of the degree word to a position from which it can select the clause, cf. Guéron and May (1984), Culicover and Rochemont (1990). Consider how these authors propose that the satellite gets selected. They adopt a principle, called the Complement Principle by Culicover and Rochemont (1990: 41), which enables the degree word to license the satellite when it has been adjoined to a clause by covert movement³:

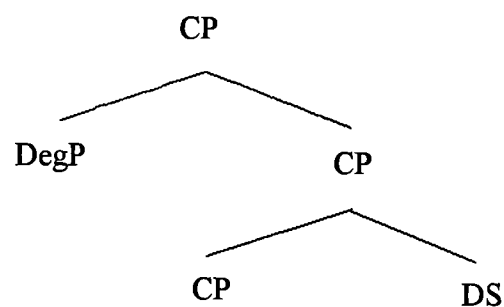
³ We should note that such an assumption violates the pervasive generalisation that the selectional requirements of heads are satisfied where they are base-generated.

(43) *Complement Principle*

β is a *potential complement* of α ($\alpha, \beta = X^{\max}$), only if α and β are in a government relation⁴.

A structure which illustrates this procedure for degree constructions is given in (44):

(44)



The degree word is able to license the satellite in (44) according to (43) because DegP c-commands DS, and there is no intervening barrier. Therefore DegP governs the satellite, and the satellite may be the degree head's complement. Crucially, we may distinguish modifiers from heads under this account, in that heads would not be expected to license elements in a configuration like (44). Head-movement is not possible over a long distance because of locality considerations. A moved head is licensed by the next head c-commanding its base-position, and so its movement is a very local process. Modifiers, on the other hand, are able to move long distances since they are subject to a looser licensing condition, namely antecedent-government. Doetjes, Neeleman and van de Koot (1998) argue that degree words split into a

⁴ A *complement* for Culicover and Rochemont is a phrase which has an argument or adjunct relation with the head of the phrase it is governed by.

typology according to which some are heads, and some are modifiers. Therefore, we would not expect those words classified as heads to be able to license a clause with a wide-scope reading. The following evidence shows that *too* may combine with APs only, and thus is a head (this data appears in Doetjes, Neeleman and van de Koot 1998: 327-329⁵):

- (45) a. He is [_{DegP} too [_{AP} famous]] to leave town.
 b. *He is [_{DegP} too [_{PP} under scrutiny]] to be elected at this time.
 c. *He is [_{DegP} too [_{DP} a scientist]] to care about such problems.
 d. *He [_{DegP} too [_{VP} likes venison]] for his own good.

However, *enough* is a modifier, and so we would expect it to be able to license a wide-scope reading:

- (46) a. He is [_{AP} [_{AP} funny] [enough]] to be my buddy.
 b. He is [_{PP} [enough] [_{PP} over the limit]] to be arrested.
 c. He is [_{DP} [_{DP} man] [enough]] for Sue.
 d. He [_{VP} [_{VP} loves Mary] [enough]] to marry her.

Consider the data in (47) for result clauses illustrating a wide-scope reading:

α governs β if α c-commands β , and there is no δ , δ a barrier for β , that excludes α .

⁵ They do not give data for *so*. Consider the following:

- (i) a. He is [so [famous]] that he has to leave town after a short time.
 b. He is [so [under scrutiny]] that he cannot be elected.
 c. He is [*so/such [a scientist]] that he does not care about such problems.
 d. He [so (much) [likes venison]] that he eats it all the time.

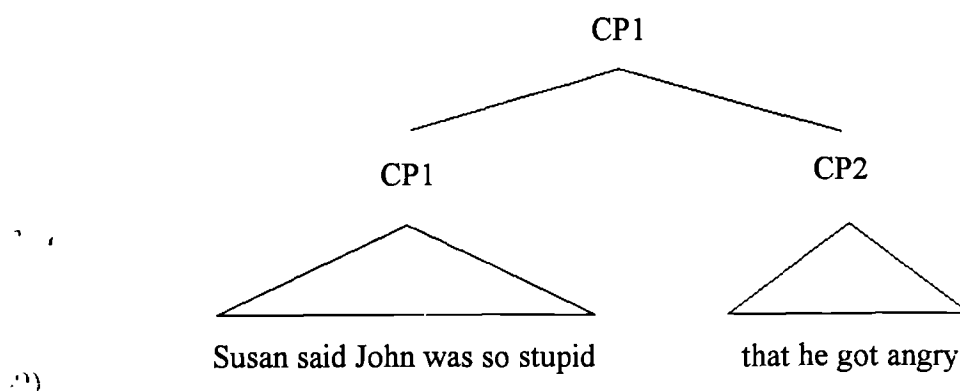
It appears to be the case that *so* is a modifier, and we would expect it to be able to take wide-scope.

- (47) a. Susan said John was so stupid that he got angry.
 b. Susan said John was just stupid enough that he got angry.
 c. Susan said John was stupid enough for him to get angry.
 d. *Susan said John was too clever for him to get angry .¹⁰

As expected, the only degree word which Doetjes, Neeleman and van de Koot classify as a head, *too*, cannot license a wide-scope reading.

Let us determine the structure for these examples. We will compare the structure¹¹ where the satellite is base-generated as adjoined to the matrix clause and the degree word moves covertly, (48b), with one where the result clause is in situ, (48a), equivalent to structure (14); one where the DegP or AP as a whole is raised covertly, (48c); and one where just the satellite is, (48d):

- (48) a. [Susan said John was [[so stupid] [that he got angry]]].
 b.



¹⁰ There is the possibility here of interpreting *enough* and *too*'s infinitival satellite as a purpose clause. We will ignore this reading, though, during the following discussion.

¹¹ Kayne (1994) has proposed a right-branching structure to encode such an interpretation for result clauses and comparatives. We will consider this approach in Chapter 3.

Principle C is not violated in (49), indicating that only structure (48b) may be correct. (48c) and (48d) cannot be, since reconstruction of the predicate or just the satellite would bring *John* into the c-command domain of *he*, which would lead us to expect a Principle C violation, contrary to fact. (48d) also violates the Right Roof Constraint of Ross (1967), which imposes a clause-boundedness restriction on rightward movement. Equally, the fact that the in situ satellite in (48a) is c-commanded by *he* rules out that structure as well. Thus we propose that structure (48b) encodes the wide-scope reading for result clauses.

Consider now the narrow-scope reading of result clauses:

- (50)
- a. Susan said John was so stupid that he had left his keys at home.
 - b. Susan said John was just⁸ stupid enough that he had left his keys at home.
 - c. Susan said John was just stupid enough for him to leave his keys at home.
 - d. Susan said John was too clever for him to leave his keys at home.

These examples have the reading where Susan said that John's high degree of stupidity caused him to leave his keys at home, or not to do this in the case of (50d). Such an interpretation may be instantiated in the same range of structures as the wide-scope reading was, namely one where the result clause is in situ, (51a); one where it is base-generated adjoined to the embedded clause, (51b); one where the DegP or AP as

⁸ There is an alternative frequency reading for *enough*, i.e. Susan said John was stupid *often enough*. The modifier *just* forces a degree interpretation on *enough* though.

a whole is raised covertly, (51c); and finally one where just the satellite is raised, (51d):

- (51)
- a. [Susan said John was [[so stupid] [that he got angry]]].
 - b. [Susan said [_{CP} [_{CP} John was so stupid] [that he had left his keys at home]]].
 - c. [Susan said [[_{DegP/AP} so stupid that he had left his keys at home] John was *t*_{DegP/AP}]].
 - d. [Susan said [_{CP} [_{CP} John was [so stupid *t*_{SAT}]] [that he had left his keys at home]]].

We will use Principle C data to test whether *John* can c-command into the result clause:

- (52)
- a. *Susan said *he*_i was so stupid that *John*_i had left his keys at home.
 - b. *Susan said *he*_i was just stupid enough that *John*_i had left his keys at home.
 - c. *Susan said *he*_i was just stupid enough for *John*_i to leave his keys at home.
 - d. *Susan said *he*_i was too clever for *John*_i to leave his keys at home.

We can see that Principle C is violated in (52), therefore *he* must c-command *John*. In comparison with the wide-scope structures where the base-generated adjunction structure, (48b), was assumed to be correct, the adjunction structure in (51b) cannot be for the narrow-scope reading, since *he* must c-command into the satellite. (51c)

and (51d) may be correct, though, since DegP can be reconstructed at LF, and thus *he* will c-command *John*, as it does in (51a).

We may test the structural properties of infinitival result clauses further by considering the possibility of extraction out of the satellite: recall that argument extraction out of finite satellites is downgraded, which explains why similar data is not provided for them:

- (53) a. What did Susan say John was just stupid enough [for him to leave *t* at home]?
- b. What did Susan say John was too stupid [for him to leave *t* at home]?

Since *what* can be extracted out of the result clause in (53), the adjoined structure in (51b) is not expected to be correct, but the rest may be.

Given that raising of the whole DegP or AP is ruled out under the wide-scope reading, we may argue by analogy that it is here too. If such operations were possible under one reading, it should equally be possible for the other. Therefore, we have an indirect argument against (51c). We can conclude from this discussion of result clause scope data, then, that the satellite is a base-generated clausal adjunct when it takes wide-scope, (48b), but when it takes narrow-scope it is either in situ, (51a), or the satellite raises to right-adjoin to the embedded clause, a proposal which keeps the assumption underlying Culicover and Rochemont's work, namely that it is the satellite's position which indicates scope. Under the economy condition Procrastinate of Chomsky (1995), we expect the former to be preferred. We will see in Chapter 3, though, that the latter may be necessary under restricted circumstances because result clauses need to be selected.

The distinction between heads and modifiers discussed above is not relevant to comparatives, since we have argued that comparative satellites are adjuncts. Therefore, they are not selected by the degree word, which will consequently not need to raise covertly. This entails further that a wide-scope reading will be more freely available for comparatives than it was for result clauses. Let us consider the following:

- (54) a. Susan said Mary was taller/more tall than she was.
 b. Susan said Mary was less tall than she was.
 c. Susan said Mary was as tall as she was.

The narrow-scope reading comparatives have is given in (55):

- (55) Susan said that Mary had a height, h_1 , and a height, h_2 , and h_1
 was greater/lesser than h_2 /the same as h_2 .

Thus (54) has a reading according to which Susan has said a contradiction in the case of *more/less*, or that Mary has the same height as Susan said she had. A further reading is available where the time encoded in the copulas is not identical, i.e. that Susan said Mary was taller than she used to be, but we will ignore it for the remainder of the discussion. The wide-scope reading is given in (56):

- (56) Mary was of height h_2 and Susan said she had a height, h_1 , which
 was greater/lesser than h_2 /the same as h_2 .

As expected, each of the satellites may take wide-scope¹³. Here, Susan has simply got Mary's height right or wrong. Let us consider whether the satellite may be adjoined to a clause under either reading. The narrow-scope version in (55) may have one of the structures in (57) which are equivalent to those in (48) for the result clause:

- (57) a. [Susan said [Mary was [[as tall] [as she was]]]].
 b. [Susan said [CP [CP Mary was as tall] [as she was]]].
 c. [Susan said [[DegP/AP as tall as she was] Mary was t_{DegP/AP}]].
 d. [Susan said [CP [CP Mary was [as tall t_{SAT}]] [as she was]]].

The wide scope version in (56) may have one of the structures in (58):

- (58) a. [Susan said [Mary was [[as tall] [as she was]]]].
 b. [CP [CP Susan said Mary was as tall] [as she was]].
 c. [[DegP/AP as tall as she was] Susan said Mary was t_{DegP/AP}].
 d. [CP [CP Susan said Mary was [as tall t_{SAT}]] [as she was]].

¹³ Just for the record, *as* is treated by Doetjes, Neeleman and van de Koot (1998) as a head, while the rest are modifiers. Consider the differences between these comparative heads:

- (i) a. He is [AP [more] [AP famous]] than I thought.
 b. He is [PP [more] [PP on drugs]] than any of his friends.
 c. He is [DP [more] [DP a linguist]] than a psychologist.
 d. He [VP [VP likes venison] [more]] than his family does.
- (ii) a. His paper is [AP [less] [AP interesting]] than I thought.
 b. He is [PP [less] [PP into syntax]] than he was before.
 c. He is [DP [less] [DP a typical Hollywood celebrity]] than any of his neighbours.
 d. He [VP [VP lives like a celebrity] [less]] than he would like to.
- (iii) a. He is [DegP as [AP intelligent]] as Bill.
 b. *He is [DegP as [PP over the limit]] as Bill.
 c. *He is [DegP as [DP a typical Hollywood celebrity]] as Robin Williams.
 d. *He [DegP as [VP lives like a typical Hollywood celebrity]] as Robin Williams.

We will test to see if Principle C is violated under either reading. Consider the following: (59) is for narrow-scope, and (60) is for wide-scope:

- (59) a. *John said she_i was taller/more tall than Mary_i used to be.
 b. *John said she_i was less tall than Mary_i used to be.
 c. *John said she_i was as tall as Mary_i used to be.
- (60) a. John said she_i was taller/more tall than Mary_i really was.
 b. John said she_i was less tall than Mary_i really was.
 c. John said she_i was as tall as Mary_i really was.

She cannot co-refer with *Mary* under the narrow-scope reading in (59), indicating that the former c-commands the latter. Therefore only structure (57b) is ruled out, since no reconstruction takes place, as it does in (57c,d). However co-reference is possible under the wide-scope reading in (60), indicating that *she* does not c-command *Mary*. Therefore only (58b) may be correct for that reading¹⁰. As we did with the structure for the narrow-scope reading of result clauses, we may by analogy reject structure (57c) for comparatives, since such a structure ought to be equally available for the

¹⁰ There appears to be a wide-scope reading encoded in the following clausal comparatives:

- (i) a. Susan said Mary was taller than Bill did/said.
 b. Susan said Mary was as tall as Bill did/said.

I treat these as narrow-scope examples where the only material that is reconstructed is from the embedded clause. Consider the following Principle C data in support of this conclusion:

- (ii) a. *Susan said he_i was taller than Bill_i did/said.
 b. *Susan said he_i was as tall as Bill_i did/said.

wide-scope reading. Therefore we are left with either (58a) or (58d). By Procrastinate, we will adopt (58a): there is no need to select the satellite, which was the reason for keeping this option open for result clauses.

We shall also test nominal versions of (54):

- (61)
- a. Susan said Mary was taller/more tall than Bill.
 - b. Susan said Mary was less tall than Bill.
 - c. Susan said Mary was as tall as Bill.

The difference between the wide-scope and narrow-scope readings is the same as above, but with the additional wide-scope reading, which we will ignore in what follows, that Susan's and Bill's statements are being compared¹¹. There are two tests that can give us some insight into the structures associated with the two readings.

First, as Hoeksema (1983: 405) has noted, anaphors in the comparative phrase may be bound by the matrix subject in a nominal, but not in a clausal, comparative:

- (62) No man_i is taller than himself_i (*is).

Let us consider the Anaphor Binding data in (63):

- (63)
- a. John said no man_i was taller/more tall than himself_i.
 - b. John said no man_i was less tall than himself_i.
 - c. John said no man_i was as tall as himself_i.

Since co-indexation of *he* and *Bill* in (ii) causes a Principle C violation, they must c-command each other. Therefore, the satellite must be attached low enough for this to be possible, but cannot be adjoined to the matrix clause.

¹¹ See Kennedy (1997) for more on how nominal comparatives are interpreted.

The only reading we get for (63) is the narrow-scope one where John has said a contradiction. Thus, *no man* must be able to c-command the anaphor there, which rules out a base-generated adjunction structure like (57b) for (61). The adjoined structure for the wide-scope reading in (58b) may be correct though.

We have cited evidence over the last two sections for the degree satellite being attached in a left-branching DegP (§2.2.1) when it takes narrow-scope, and for them being adjoined to the matrix clause when they take wide-scope. Also, result clauses are selected while comparatives are adjuncts. Given some assumptions regarding the locality requirements on movement of heads and modifiers, we predicted that a head could not license the wide-scope reading of a satellite, and such a head, *too*, correctly could not. I will now turn to the syntactic constituency data for degree constructions, namely Partial Predicate Fronting, Cleft and Pseudo-cleft sentences, Substitution and Predicate Ellipsis.

2.2.3 Partial Predicate Fronting

Let us consider what Partial Predicate Fronting data can tell us about the structure of degree constructions. We shall test both the narrow-scope and wide-scope readings individually for each degree head.

Recall that we are assuming that the satellite is base-generated in a left-branching DegP as in (64) for the narrow-scope readings:

- (64) [Susan said [John was [DegP/AP [DegP] [DS]]]].

Consider the data:

- (65) a. [So stupid that he had left his keys at home] Susan said John was.
b. [So stupid] Susan said John was [that he had left his keys at home].
- (66) a. [Too clever to leave his keys at home] Susan said John was.
b. [Too clever] Susan said John was [to leave his keys at home].
- (67) a. [Stupid enough to leave his keys at home] Susan said John was.
b. [Stupid enough] Susan said John was [to leave his keys at home].
- (68) a. [Stupid enough that he had left his keys at home] Susan said John was.
b. [Stupid enough] Susan said John was [that he had left his keys at home].
- (69) a. [More tall than she used to be] Susan said Mary was.
b. [More tall] Susan said Mary was [than she used to be].
- (70) a. [Taller than she used to be] Susan said Mary was.
b. [Taller] Susan said Mary was [than she used to be].
- (71) a. [Less tall than she used to be] Susan said Mary was.
b. [Less tall] Susan said Mary was [than she used to be].
- (72) a. [As tall as she used to be] Susan said Mary was.
b. [As tall] Susan said Mary was [as she used to be].

We expect such data to result from (64), since both DegP or its lower segment can raise, cf. the b cases of (65)-(72), as can the full phrase, cf. the a cases. As I indicated during the discussion of the Partial VP Fronting data, a right-branching derivation à la

Phillips (1996) may also be available which can derive (65)-(72). Whether such a structure can be justified will be the subject of Chapter 3.

Now let us consider the wide-scope data we have identified: recall that *too* does not have such a reading. The structure for the wide-scope data is:

(73) [CP [CP Susan said John was [DegP/AP]] [DS]].

The data is:

- (74) a. *[So stupid that he got angry] Susan said John was.
b. [So stupid] Susan said John was [that he got angry].

- (75) a. *[Stupid enough to get angry] Susan said John was.
b. [Stupid enough] Susan said John was [to get angry].

- (76) a. *[Stupid enough that he got angry] Susan said John was.
b. [Stupid enough] Susan said John was [that he got angry].

- (77) a. *[More tall than she really was] Susan said Mary was.
b. [More tall] Susan said Mary was [than she really was].

- (78) a. *[Taller than she really was] Susan said Mary was.
b. [Taller] Susan said Mary was [than she really was].

- (79) a. *[Less tall than she really was] Susan said Mary was.
b. [Less tall] Susan said Mary was [than she really was].

- (80) a. *[As tall as she really was] Susan said Mary was.
b. [As tall] Susan said Mary was [as she really was].

In (73), the DegP is a constituent so we expect the b cases to be grammatical. Unlike the narrow-scope versions above, the DegP/AP and satellite together are not a constituent, so the a cases are ungrammatical, as expected.

2.2.4 Cleft sentences

Cleft sentences suggest the same conclusion. Consider data based on the narrow-scope readings first:¹⁶

- (81) a. It was [so stupid that he had left his keys at home] that Susan said John was.
 b. It was [so stupid] that Susan said John was [that he had left his keys at home].
- (82) a. It was [too clever to leave his keys at home] that Susan said John was.
 b. It was [too clever] that Susan said John was [to leave his keys at home].
- (83) a. It was [stupid enough to leave his keys at home] that Susan said John was.
 b. It was [stupid enough] that Susan said John was [to leave his keys at home].
- (84) a. It was [stupid enough that he had left his keys at home] that Susan said John was.
 b. It was [stupid enough] that Susan said John was [that he had left his keys at home].

¹⁶ There is some dialect variation regarding Cleft constructions with respect to whether DegPs/APs can be focussed. In my own dialect, focusing becomes easier when the DegP/AP is associated with a satellite.

- (85) a. It was [more tall than she used to be] that Susan said Mary was.
 b. It was [more tall] that Susan said Mary was [than she used to be].
- (86) a. It was [taller than she used to be] that Susan said Mary was.
 b. It was [taller] that Susan said Mary was [than she used to be].
- (87) a. It was [less tall than she used to be] that Susan said Mary was.
 b. It was [less tall] that Susan said Mary was [than she used to be].
- (88) a. It was [as tall as she used to be] that Susan said Mary was.
 b. It was [as tall] that Susan said Mary was [as she used to be].

Once again, a left-branching structure like (64) explains (81)-(88):

- (64) [Susan said [John was [DegP/AP [DegP] [DS]]]].

Both segments of DegP or AP and DegP together in (64) would be expected to be able to raise. As with the Partial Predicate Fronting data, though, a right-branching derivation like that proposed by Phillips (1996) would explain the grammaticality of these Cleft sentences.

Now consider the wide-scope variations:

- (89) a. *It was [so stupid that he got angry] that Susan said John was.
 b. It was [so stupid] that Susan said John was [that he got angry].
- (90) a. *It was [stupid enough to get angry] that Susan said John was.
 b. It was [stupid enough] that Susan said John was [to get angry].

- (91) a. *It was [stupid enough that he got angry] that Susan said John was.
 b. It was [stupid enough] that Susan said John was [that he got angry].
- (92) a. *It was [more tall than she really was] that Susan said Mary was.
 b. It was [more tall] that Susan said Mary was [than she really was].
- (93) a. *It was [taller than she really was] that Susan said Mary was.
 b. It was [taller] that Susan said Mary was [than she really was].
- (94) a. *It was [less tall than she really was] that Susan said Mary was.
 b. It was [less tall] that Susan said Mary was [than she really was].
- (95) a. *It was [as tall as she really was] that Susan said Mary was.
 b. It was [as tall] that Susan said Mary was [as she really was].

Consider again the structure for the wide-scope readings from (73):

- (73) [CP [CP Susan said John was [DegP/AP]] [DS]].

As with the Partial Predicate Fronting cases, the a cases are not expected to be grammatical, since DegP/AP and the satellite cannot be a constituent together.

2.2.5 Pseudo-cleft sentences

Our preliminary conclusion receives a setback when we consider Pseudo-cleft sentences. The narrow-scope data is:

- (96) a. What Susan said John was, was [so stupid that he had left his keys at home].
- b. *What Susan said John was [that he had left his keys at home], was [so stupid].
- (97) a. What Susan said John was, was [too clever to leave his keys at home].
- b. *What Susan said John was [to leave his keys at home], was [too clever].
- (98) a. What Susan said John was, was [stupid enough to leave his keys at home].
- b. *What Susan said John was [to leave his keys at home], was [stupid enough].
- (99) a. What Susan said John was, was [stupid enough that he had left his keys at home].
- b. *What Susan said John was [that he had left his keys at home], was [stupid enough].
- (100) a. What Susan said Mary was, was [more tall than she used to be].
- b. *What Susan said Mary was [than she used to be], was [more tall].
- (101) a. What Susan said Mary was, was [taller than she used to be].
- b. *What Susan said Mary was [than she used to be], was [taller].
- (102) a. What Susan said Mary was, was [less tall than she used to be].
- b. *What Susan said Mary was [than she used to be], was [less tall].
- (103) a. What Susan said Mary was, was [as tall as she used to be].
- b. *What Susan said Mary was [as she used to be], was [as tall].

Recall the narrow-scope left-branching structure from (64), repeated:

- (64) [Susan said [John was [_{DegP/AP} [_{DegP}] [DS]]]].

The lower segment of DegP or AP here should be able to correspond to *what*, while stranding the satellite, as we have already seen in the Partial Predicate Fronting and Cleft sentence data. Since the b sentences in (96)-(103) are out, one may suspect that (64) is incorrect. For Heycock and Kroch (1999), Pseudo-clefts are equatives. Crucially, their interpretation takes place post-LF as a part of discourse, and the focus is not copied into the position of *what*. Therefore, the free relative must be syntactically fully licensed. As Hans van de Koot (p.c.) has pointed out, *what* would not be able to select the satellite in the b cases, since it does not have its own selectional properties, or be able to take it as its adjunct.

Now consider the wide-scope versions:

- (104) a. *What Susan said John was, was [so stupid that he got angry].
b. *What Susan said John was [that he got angry], was [so stupid].
- (105) a. *What Susan said John was, was [stupid enough to get angry].
b. *What Susan said John was [to get angry], was [stupid enough].
- (106) a. *What Susan said John was, was [stupid enough that he got angry].
b. *What Susan said John was [that he got angry], was [stupid enough].
- (107) a. *What Susan said Mary was, was [more tall than she really was].
b. *What Susan said Mary was [than she really was], was [more tall].
- (108) a. *What Susan said Mary was, was [taller than she really was].

- b. *What Susan said Mary was [than she really was], was [taller].
- (109) a. *What Susan said Mary was, was [less tall than she really was].
- b. *What Susan said Mary was [than she really was], was [less tall].
- (110) a. *What Susan said Mary was, was [as tall as she really was].
- b. *What Susan said Mary was [as she really was], was [as tall].

Here, the a cases are out as expected since DegP/AP and the satellite are not constituents, but so are the b ones. If the degree word licenses the satellite, these b cases too will be ruled out because *what* cannot select the satellite, or be able to take the satellite as its adjunct.

2.2.6 Substitution and Predicate Ellipsis

There is a pro-form that substitutes for the whole or part of DegPs, *so*, as has been extensively demonstrated by Corver (1997a, 1997b) and Doetjes, Neeleman and van de Koot (1998). Consider the following:

- (111) a. John was [so angry that he shouted], and Mary was [*so*] too.
- b. John was [too angry to care], and Mary was [*so*] too.
- c. John was [angry enough to care], and Mary was [*so*] too.
- d. John was [angry enough that he shouted], and Mary was [*so*] too.
- (112) a. John was [more angry than Bill], and Mary was [*so*] too.
- b. John was [angrier than Bill], and Mary was [*so*] too.

- c. John was [less angry than Bill], and Mary was [*so*] too.
- d. John was [as angry as Bill], and Mary was [*so*] too.

In each of these cases, *so* substitutes for the whole predicate in the first conjunct. It should be possible, if DegPs/APs do have the left-branching structure in (64) for the narrow-scope reading, for *so* to substitute for the lower DegP segment while leaving the satellite unaffected:

(64) [Susan said [John was [DegP/AP [DegP] [DS]]]].

Consider the data:

- (113) a. *Susan said John was [so stupid that he had left his keys at home], and Mary was *so* [that she had left her purse].
- b. *Susan said John was [too clever to leave his keys at home], and Mary was *so* [to leave her purse].
- c. *Susan said John was [stupid enough to leave his keys at home], and Mary was *so* [to leave her purse].
- d. *Susan said John was [stupid enough that he had left his keys at home], and Mary was *so* [that she had left her purse].
- (114) a. *Susan said Mary was [more tall than she used to be], and Kathy was *so* [than she used to be].
- b. *Susan said Mary was [taller than she used to be], and Kathy was *so* [than she used to be].

- c. *Susan said Mary was [less tall than she used to be], and Kathy was *so*
[than she used to be].
- d. *Susan said Mary was [as tall as she used to be], and Kathy was *so*
[as she used to be].

Just like the Pseudo-cleft data above, this data suggests that the left-branching structure (64) is incorrect. However, if we assume that *so* is base-generated as a DegP or AP, we would not expect it to be able to license a satellite, since they are licensed by degree heads. Therefore a pro-DegP/AP like *so* could not, nor would *so* be able to take the satellite as its adjunct.

Consider now the same data under a wide-scope reading:

- (115) a. *Susan said John was [so stupid that he got angry], and Mary was *so*
[that she shouted].
 - b. *Susan said John was [stupid enough to get angry], and Mary was
so [to shout].
 - c. *Susan said John was [stupid enough that he got angry], and Mary was
so [that she shouted].
-
- (116) a. *Susan said Mary was [more tall than she really was], and Kathy was
so [than she really was].
 - b. *Susan said Mary was [taller than she really was], and Kathy was *so*
[than she really was].
 - c. *Susan said Mary was [less tall than she really was], and Kathy was *so*
[than she really was].

- d. *Susan said Mary was [as tall as she really was], and Kathy was *so* [as she really was].

Again, the same considerations apply to these as to the narrow-scope data above. If the satellite is licensed through selection under the wide-scope reading, *so* cannot perform this operation, since it is a pro-DegP/AP, nor could *so* take the satellite as its adjunct.

Consider Predicate Ellipsis performed on narrow-scope examples:

- (117) a. *Susan said John was [so stupid that he had left his keys at home], and Mary was [that she had left her purse].
b. *Susan said John was [too clever to leave his keys at home], and Mary was [to leave her purse].
c. *Susan said John was [stupid enough to leave his keys at home], and Mary was [to leave her purse].
d. *Susan said John was [stupid enough that he had left his keys at home], and Mary was [that she had left her purse].
- (118) a. *Susan said Mary was [more tall than she used to be], and Kathy was [than she used to be].
b. *Susan said Mary was [taller than she used to be], and Kathy was [than she used to be].
c. *Susan said Mary was [less tall than she used to be], and Kathy was [than she used to be].

- d. *Susan said Mary was [as tall as she used to be], and Kathy was
[as she used to be].

We may explain this data in the same way as we did the Substitution data above. Following Lobeck (1995), let us assume that the ellipsis site is filled by *pro*. This *pro* will be a DegP or AP. Therefore the satellite in the clause where ellipsis has taken place cannot be licensed by the *pro*, nor could it be taken as *pro*'s adjunct.

Finally, there are examples of wide-scope where ellipsis has been performed:

- (119) a. *Susan said John was [so stupid that he got angry], and Mary was
[that she shouted].
b. *Susan said John was [stupid enough to get angry], and Mary was
[to shout].
c. *Susan said John was [stupid enough that he got angry], and Mary was
[that she shouted].
- (120) a. *Susan said Mary was [more tall than she really was], and Kathy was
[than she really was].
b. *Susan said Mary was [taller than she really was], and Kathy was
[than she really was].
c. *Susan said Mary was [less tall than she really was], and Kathy was
[than she really was].
d. *Susan said Mary was [as tall as she really was], and Kathy was
[as she really was].

Once again, if *pro* has to license the satellite under the wide-scope reading, it cannot do so, since it is a pro-DegP/AP, nor could it take the satellite as its adjunct.

2.3 Summary of the test results

Let us consider the following table, comparing the results of the tests presented in this chapter for VPs and degree constructions (LB=left-branching):

(121) *Table on left-branching data*

	Verb Phrases	Degree Constructions
Semantic	? (§2.1.1)	LB adjunct comparatives; *LB adjunct result clauses (§2.2.1) *LB narrow-scope; LB wide-scope (§2.2.2)
Partial Fronting	LB (§2.1.2)	*LB narrow-scope; LB wide-scope (§2.2.3)
Cleft sentences	LB (§2.1.3)	*LB narrow-scope; LB wide-scope (§2.2.4)

Pseudo-cleft sentences	LB (§2.1.3)	*LB narrow-scope; *LB wide-scope (§2.2.5)
Substitution	LB (§2.1.4)	*LB narrow-scope; *LB wide-scope (§2.2.6)
Ellipsis	LB (§2.1.4)	*LB narrow-scope; *LB wide-scope (§2.2.6)

It can be seen that the VP tests produce an almost unanimous conclusion, that English VPs have a left-branching structure, but we rejected the only semantic one. We saw that data from degree constructions suggested that degree satellites were in a left-branching structure in the predicate hosting the degree word when they took narrow-scope, and were adjoined to the matrix clause when they took wide-scope. The syntactic evidence appeared to be inconclusive. However, we were able to explain why the Pseudo-cleft sentence test was expected to fail to return the expected results, and also the Substitution and Predicate Ellipsis tests. Thus, we can conclude that degree constructions have a left-branching structure.

CHAPTER 3

EVIDENCE FOR RIGHT-BRANCHING IN ENGLISH DEGREE CONSTRUCTIONS

3.0 Introduction

Evidence for syntactic structures being left-branching was presented in the previous chapter. The opposite type of evidence will be considered now, that which suggests that the internal structure of English VPs and degree constructions is right-branching. What does this evidence consist of? Larson (1988a) used c-command data from Barss and Lasnik (1986) and co-ordination data to argue for such a structure for VPs. Larson's proposal has problems with the constituency data suggesting a left-branching structure which we considered in Chapter 2. Other data from Ernst (1994) and Stroik (1996) dealing with the scopal properties of adverbials confirm the view that his conception of VP structure is not ideal. Pesetsky (1995) also noted the contradiction between the evidence for right-branching and that for left-branching. In addition, his work brought to light evidence for an even more right-branching structure than Larson argued for. Pesetsky proposed that a VP is associated with both a left-branching (or Layered) structure and a right-branching (or Cascade) structure generated in parallel. However, Phillips (1996) has argued that a right-branching structure can be made compatible with some of the evidence for apparent left-branching, given certain assumptions about how syntactic structures are generated.

Recall that, in the degree construction domain, evidence was presented in Chapter 2 that they are adjoined to the matrix clause when the degree word takes wide-scope. Several proposals involving right-branching structures have been made to cope with these scope data. Kayne (1994) analyses the satellite as having the remainder of the sentence in its specifier under the wide-scope reading, or just the Degree Phrase for the narrow-scope one. Baltin (1987) has proposed a dual structure approach similar to Pesetsky's (1995) one for VPs. There have also been some co-ordination approaches to degree constructions which we will consider. Right-branching, VP-shell-like structures have been proposed by Larson (1991), Izvorski (1995) and White (1998) for comparatives, and by White (1997) for result clauses. These proposals share the same general problem that VP shells have, namely that they cannot explain the syntactic constituency test data which suggests a left-branching structure, therefore we will consider the possibility of deriving such shells in the method proposed by Phillips (1996) for VP shells.

The evidence for right-branching in VPs will be considered in detail in §3.1. The wide-ranging debate on VP structure over this and the previous chapter will be evaluated in §3.2. Then, we will then turn to degree constructions. Three right-branching approaches to degree word scope will be considered in §3.3, all of which we will reject. The remainder of the discussion will focus on the right-branching shell structure approaches. A Phillips (1996)-style derivation will be considered first of all in §3.4, and c-command and co-ordination evidence will be sought for it. This data will be seen to return contradictory results, and so some cases will be re-evaluated in §3.5. The overall conclusion will be that there is no evidence for this radically right-branching structure. We will also seek evidence for a slightly less radically right-branching structure where a PP complement of AP forms a constituent with the

satellite in §3.7 using co-ordination data. Once again no evidence can be found for the shell approach with respect to comparatives, but such evidence is present for result clauses. Comparatives are found to have a structure where the AP as a whole forms a constituent with the satellite. For narrow-scope readings, result clauses have a right-branching structure. With the wide-scope reading, both types of satellite are adjoined to the matrix clause. We may see the situation as further evidence in favour of Phillips' view of structure generation, where left-branching structures are allowed where such structures encode a different interpretation from a corresponding right-branching one.

3.1 Evidence for right-branching in Verb Phrases

3.1.1 C-command and co-ordination evidence for VP structure

Barss and Lasnik (1986: 347-349) have presented evidence suggesting that, in the double object construction, the indirect object asymmetrically c-commands the direct object. Let us consider Anaphor Binding and NPI Licensing data first of all:

(1) *Anaphor Binding*

- a. I showed John_i himself_i (in the mirror).
- b. *I showed himself_i John_i (in the mirror).

(2) *NPI Licensing*

- a. I gave no one anything.
- b. *I gave anyone nothing.

Anaphor Binding is the classic c-command test, indicating that the antecedent of *himself* in (1a) must c-command it. The same c-command constraint has been proposed for NPI Licensing too, cf. Ladusaw (1979), Linebarger (1980) and Progovac (1992, 1994), and thus the negation must c-command the NPI in (2a). Now let us consider the rest of the tests:

(3) *Quantifier Binding*

- a. I denied each worker_i his_i paycheck.
- b. *I denied its_i owner each paycheck_i.

(4) *Each...the other*

- a. I gave each man_i the other_i's watch.
- b. *I gave the other_i's trainer each lion_i.

(5) *Weak Crossover*

- a. Which worker_i did you deny t_i his_i paycheck?
- b. *Which paycheck_i did you deny its_i owner t_i?

(6) *Superiority*

- a. Who did you give t which book?
- b. *Which book did you give who t?

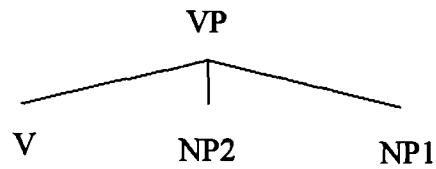
Reinhart (1983: 113ff.) has argued that a c-command restriction holds over the Quantifier Binding and Weak Crossover tests, namely that a bound reading on a pronoun is only possible when that pronoun is in the c-command domain of a quantifier

or *wh*-trace. A c-command requirement can be proposed for the Superiority and *Each...the other* tests as well. The relevance of a syntactic account for the phenomena in (3)-(6) is suggested by the following asymmetries:

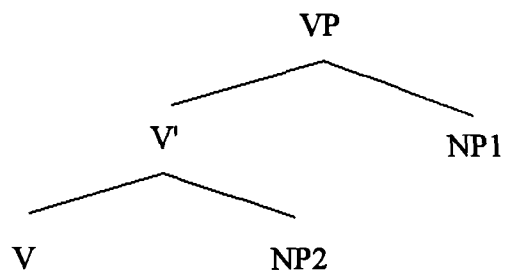
- (7) a. Each man_i hates his_i bank manager.
b. *Friends of each man_i hate his_i bank manager.
- (8) a. Each man_i hates the other_i's bank manager.
b. *Friends of each man_i hates the other_i's bank manager
- (9) a. Who_i t_i hates his_i bank manager?
b. *Who_i does his_i bank manager hate t_i?
- (10) a. Who t hates which man?
b. *Who does which man hate t?

Examples (7b) and (8b) indicate that the quantifier needs to c-command *his* or *the other* in order for a bound reading to be possible. For the Superiority and Weak Crossover tests, ungrammaticality results if the pronominal or *wh*-phrase are not c-commanded by the *wh*-trace. Consider the ternary and left-branching structures for the double object construction below:

(11) a.



b.



Barss and Lasnik conclude that both structures in (11) must be rejected in view of the data in (1)-(6), since NP2 does not asymmetrically c-command NP1 in either one.

Larson (1988a: 338) himself extends the set of c-command data to the dative alternation. The data given in (12)-(17) indicates that the direct object asymmetrically c-commands into the dative PP:

(12) *Anaphor Binding*

- a. I showed Mary_i to herself_i.
- b. *I showed herself_i to Mary_i.

(13) *NPI Licensing*

- a. I sent no presents to any of the children.
- b. *I sent any of the packages to none of the children.

(14) *Quantifier Binding*

- a. I sent every check_i to its_i owner.
- b. ??I sent his_i paycheck to every worker_i.

(15) *Each...the other*

- a. I sent each worker_i to the other_i's parents.
- b. *I sent the other_i's check to each worker_i.

(16) *Weak Crossover*

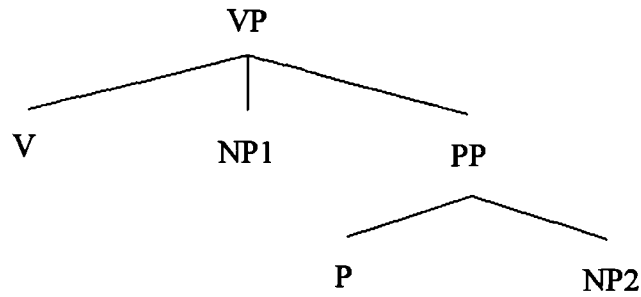
- a. Which check_i did you send t_i to its_i owner?
- b. *Which worker_i did you send his_i check to t_i?

(17) *Superiority*

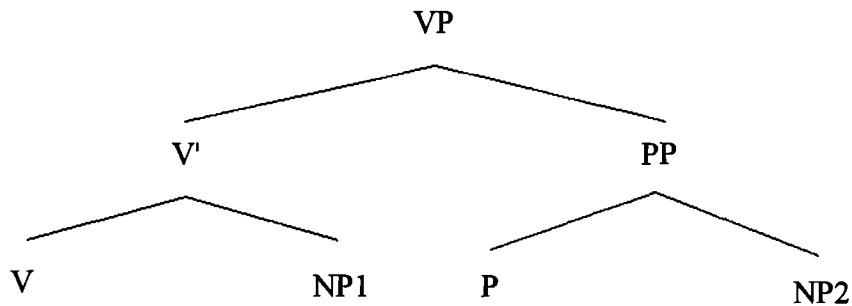
- a. Which check did you send t to who?
- b. *Whom did you send which check to t?

Larson acknowledges that these facts by themselves do not rule out the ternary branching structure for the dative in (18a) below. Consider it and also the left-branching (18b):

(18) a.



b.



Under all standard definitions of c-command, NP1 asymmetrically c-commands NP2 in (18a). Therefore, we may say that the judgements in (12)-(17) could simply be attributed to the presence of the PP. However, if (18a) were correct for the dative, then the double object construction would presumably have one of the structures in (11) by analogy. Given that these structures make the wrong predictions with respect to the c-command data in (1)-(6), we have an indirect argument against (18a). The same only holds of (18b) if c-command is defined over maximal projections: more accurately, the notion will be m-command¹.

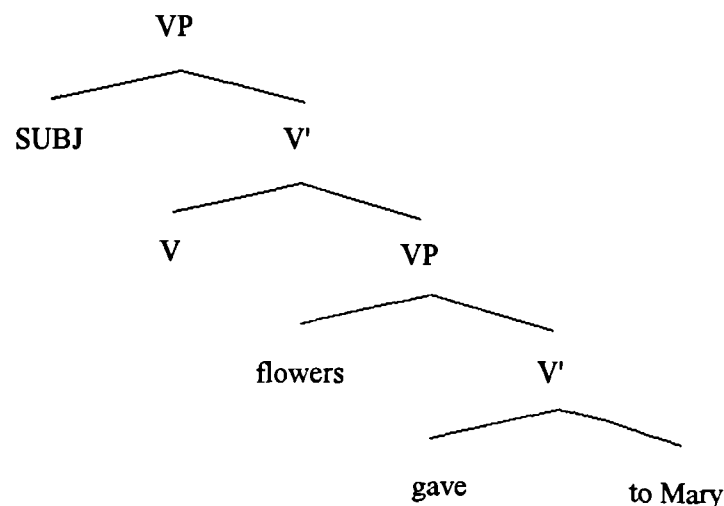
¹ Ernst (1994) proposes that such “c-command” tests are actually tests for m-command and precedence.

Larson's own proposal regarding the structure of VPs is predicated on the argument presented in §2.1.1 that the verb and indirect object in the dative construction may form an idiom. Recall the data from Larson (1988a: 340):

- (19) a. Beethoven gave the Fifth Symphony to the world.
 b. Beethoven gave the Fifth Symphony to his patron.

In (19a), "giving something to the world" is not a physical process of handing something over. Its meaning may be rendered as "Beethoven composed the Fifth Symphony". (19b) does entail a physical transfer of the score of the Fifth Symphony to Beethoven's patron. (19a) suggests that, underlyingly, *gave* and the *to*-PP form a constituent which excludes the direct object. Larson's proposed right-branching structure is called a VP shell:

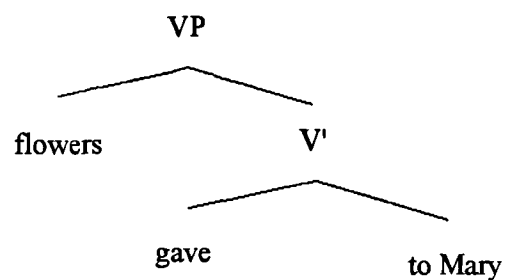
(20)



The internal arguments of *gave* are assigned their θ -roles in the lower VP projection: the direct object asymmetrically c-commands into the PP as required by (12)-(17). The subject is licensed in the specifier position of the outer VP when the verb raises into its head position.

Let us focus on the inner VP for the dative:

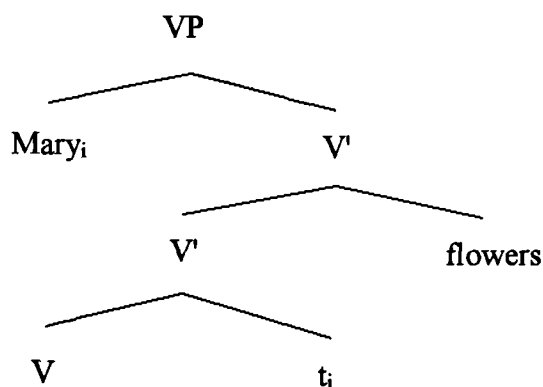
(21)



Larson acknowledges the similarity between this VP and a clause, in that there is a predicate, *gave*, with a structural subject, *flowers*, and object, *to Mary*: he views the preposition *to* as the overt manifestation of dative Case in English. Consequently, other clause-like processes could be applied to (21), e.g. passivization. One of the differences between the double object and dative constructions is the disappearance from the former of *to*, the marker for dative Case. This loss of Case marking is similar to the removal of Case from the object of a passive, which in turn suggests that the double object alternation may be derived from the dative by A-movement. The indirect object DP will then need to raise overtly to a Case-marked position by the Case Filter. Such a position is freed up in a passive by demoting the subject to an adjunct position

(realised as a *by*-phrase). Larson suggests, therefore, that *flowers* is demoted², and the Case-less *Mary* is raised into the specifier of VP in (21) to get the former's accusative Case. The raised indirect object asymmetrically c-commands the direct object position as required by (1)-(6):

(22)



One argument in favour of (20) revolves around the following co-ordination data (Larson 1988a: 345):

- (23) a. I sent [[a letter to Mary] and [a book to Sue]].
 b. I gave [[five dollars to Maxwell] and [three dollars to Chris]].

In both cases, the conjuncts may be seen as lower VPs:

- (24) [_{VP} gave_i [_{VP} [_{VP} five dollars [_V t_i to Maxwell]] and [_{VP} three dollars [_V t_i to Chris]]]].

² An important difference is that the *by*-phrase in a passive is optional, whereas the direct object here is obligatory.

Similar data can be found in the double object environment:

- (25) a. I sent [[Mary a letter] and [Sue a book]].
b. I gave [[Maxwell five dollars] and [Chris three dollars]].

The VP in (22) may also be a co-ordinated structure.

Larson (1988a: 345-346, fn.11) speculates that adjuncts are also licensed in the VP shell, attached lower than the arguments. In support of this, Stroik (1990: 656) provides evidence that the direct object of a transitive verb asymmetrically c-commands an adjunct:

(26) *Anaphor Binding*

- a. I saw the men_i somewhere near each other_i's homes.
b. *I admired each other_i's sunsets these days_i.

(27) *NPI Licensing*

- a. I saw no one anywhere.
b. *I saw anyone nowhere.

(28) *Quantifier Binding*

- a. I saw each man_i the day before he_i died.
b. *I saw a man who plays Santa on it_i every Christmas_i.

(29) *Each...the other*

- a. I photographed each man_i somewhere near the other_i's home.
- b. *I photographed a man from the other_i's city each place_i I stopped at.

(30) *Weak Crossover*

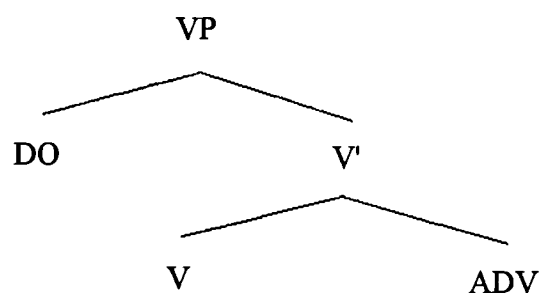
- a. Who_i did Sue admonish t_i every day his_i brother showed up drunk?
- b. *Which day_i did you read a poem about its_i sunset t_i?

(31) *Superiority*

- a. Who did you see t where?
- b. *Where did you see who t?

The structure suggested by this data is:

(32)



This treatment of adjuncts leads to a serious problem for Larson's approach, which we shall now turn to.

Recall some of the constituency data presented in the previous chapter:

(33) *Partial VP Fronting*

I said I would give flowers to Mary at 10.00, and [give flowers to Mary] I did [at 10.00].

(34) *Cleft sentences*

It was [give flowers to Mary] that I did [at 10.00].

(35) *Pseudo-cleft sentences*

What I did [at 10.00] was [give flowers to Mary].

(36) *Substitution*

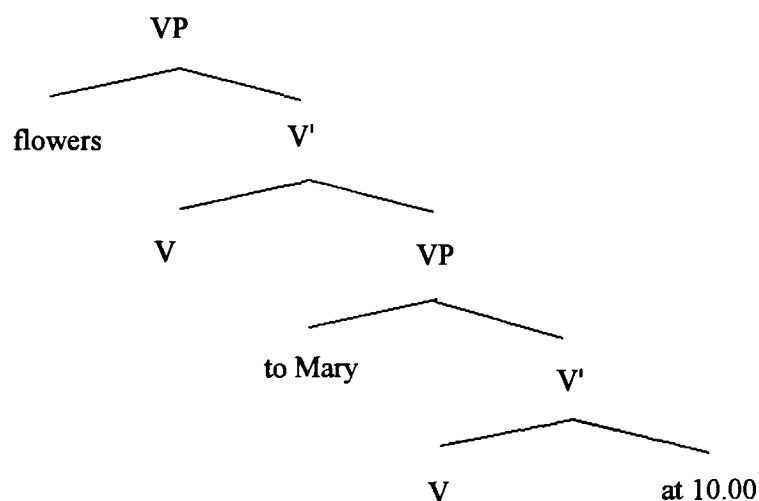
John [gave flowers to Mary] [at 10.00], and I did [so] [at 11.00].

(37) *VP Ellipsis*

John [gave flowers to Mary] [at 10.00], and I did [] [at 11.00].

In order for these cases to be derived, there must be some sub-constituent of VP that contains the internal arguments, but excludes the adjunct. If we look at the shell structure in (38) underlying (33)-(37), there is no node that meets that description:

(38)



However, although (33)-(37) appear to raise serious problems for Larson's proposal, Phillips (1996) has argued that some of this constituency data may nevertheless be captured in a right-branching structure, given certain assumptions about how syntactic structures are generated. His analysis will be presented in §3.1.3.

Ernst (1994) identifies a related problem for Larson's proposals, concerning the scopal interaction between adverbials and quantifiers. Consider the following (Ernst 1994: 329):

- (39) a. She kissed him many times willingly.
b. She kissed him willingly many times.

Example (39a) is ambiguous, with *many times* being able to take scope over *willingly* (a distributive reading), or *willingly* having wide-scope (a collective reading). (39b) only has the distributive reading. Let us consider Larsonian shell structures for them:

- (40) a. $[_{VP} \text{ him } V [_{VP} \text{ many times } [_V \text{ kissed willingly}]]]$.
 b. $[_{VP} \text{ him } V [_{VP} \text{ willingly } [_V \text{ kissed many times}]]]$.

Under the assumption, common since May (1977, 1985), that quantifiers raise, the LF for (39b) will be as follows (the actual landing-site of the quantifier is unimportant to the point being made):

- (41) $[\text{many times}_i \dots [_{VP} \text{ willingly } [_V \text{ kissed } t_i]]]$.

The LF in (41) should yield two readings. On one, *many times* takes scope over *willingly*, as required. However, there is also the option of reconstructing *many times* back into its base position. Therefore a narrow-scope reading for the quantifier should be available in (39b), contrary to fact.

The wrong predictions are made for (39a) too. Consider its LF based on (40a):

- (42) $[\text{many times}_i \dots [_{VP} t_i [_V \text{ kissed willingly}]]]$.

Willingly can only take narrow-scope with respect to the quantifier, so (39a) should be unambiguous, again contrary to fact. Such data suggests that Larson's shell structures are far from ideal.

This point is further reinforced the following (Ernst 1994: 331):

- (43) a. She insulted both suitors_i on purpose in each other_i's presence.
 b. She took none of them on purpose for any reason I'm aware of.
 c. She kissed everyone_i willingly on his_i cheek.

Larson's proposal has a number of problems with (43). One is that, in parallel with (39a), the quantified direct object in each example can take either narrow- or wide-scope with respect to the adjuncts. In Larson's terms, they have an LF similar to (42): I illustrate this point using (43a):

- (44) [both suitors_i ... [VP t_i V [VP on purpose [V_v insulted in each other's presence]]]].

The adjuncts are not able to take scope over *both suitors* in (44), and so the examples in (43) would be expected to be unambiguous, contrary to fact. A complicating factor is that the direct object needs to c-command the second adjunct, if the Anaphor Binding, NPI Licensing and Quantifier Binding relationships, respectively, are to hold, although the latter property is predicted by the VP shell structure. The scope facts of Ernst's in (39) and (43) remain unaccounted for under this proposal.

Stroik (1996: 57) provides strong evidence from the Antecedent-Contained Deletion data in (45) that Larson's treatment of adjuncts, although correct for temporal and location adjuncts, cannot be maintained for manner and reason adjuncts. Consider the following:

- (45) a. When did Mary read Lou everything Bill did?
 b. Where did Mary read Lou everything Bill did?
 c. Why did Mary read Lou everything Bill did?
 d. How did Mary read Lou everything Bill did?

Although all the cases in (45) are grammatical, there is an important difference between (45a,b) and (45c,d). The first two cases entail that the event of Mary's reading and the event of Bill's reading happen at the same time or place. Such an interpretation suggests that the adverbials modify both VPs. Assuming that the matrix VP is copied, and replaces *did* at LF, the following structure results if the trace of the adverbials is copied as well:

(46) [When/where_i did Mary [read ... t_i] ... Bill [read ... t_i]].

This LF captures the required reading for (45a,b) where the adverbial modifies both VPs. Such an LF should not be available for (45c,d), as the reason and manner adverbials may only be construed with the matrix verb. If *why* and *how* are base-generated as the lowest complements of *read*, unlike *when* and *where*, their LFs will be similar to (46), yielding a reading these examples do not have.

We should consider whether this conclusion is supported by c-command data. If manner and reason adverbials are not base-generated within VP, an internal argument of V would be predicted not to c-command them. Consider the following data, some of it repeated from (26)-(31) above. The order of the adverbials being tested is: location, temporal, manner, reason (Weak Crossover and Superiority data are irrelevant here since there is a precedence condition on them, whereby *his* or the *wh*-in-situ word should precede the trace, cf. Williams 1994: 235ff.):

(47) *Anaphor Binding*

- a. I saw the men_i somewhere near each other_i's homes.
- b. I saw the men_i during each other_i's lunchbreaks.

- c. *I interviewed the men_i at each other_i's pace.
- d. *I saw the men_i because of each other_i's money problems.

(48) *NPI Licensing*

- a. I saw no one anywhere.
- b. I bought no book at any time.
- c. *I interviewed no one at anyone else's pace.
- d. *I bought no sweets because of any addiction to them.

(49) *Quantifier Binding*

- a. I saw each man_i near his_i home.
- b. I saw each man_i during his_i lunchbreak.
- c. I interviewed each man_i at his_i own pace.
- d. *I saw each man_i because of his_i insistence.

(50) *Each...the other*

- a. I saw each man_i near the other_i's home.
- b. I saw each man_i during the other_i's lunchbreak.
- c. *I interviewed each man_i at the other_i's pace.
- d. *I saw each man_i because of the other_i's money problems.

Apart from (49c), which suggests that manner adjuncts are base-generated within VP, the data in (47)-(50) does confirm Stroik's argument that reason and manner adverbials are not base-generated within the VP unlike temporal and location ones, contrary to Larson's assumptions.

This discussion of Larson's approach to VP structure has identified a contradiction in the test data. Alongside the constituency evidence from Chapter 2 which suggested a left-branching structure, we now have c-command and co-ordination evidence which suggests a right-branching structure for VPs. We have seen that Larson himself cannot explain this contradiction, and also that his analysis cannot account for the scope data from Ernst (1994) and Stroik (1996). Let us therefore consider an alternative proposal.

3.1.2 A dual structure approach to VPs

Pesetsky (1995) points out two separate problems for Larson's proposal. One is the constituency data which we have already considered, and the other that c-command evidence for PPs suggests a far more right-branching structure than Larson allows for. Pesetsky proposes a dual representation analysis: one structure is a flatter, left-branching Layered representation, to account for the constituency data; and the other is a radically right-branching (to use Phillips' 1996 terminology) Cascade structure which derives c-command and co-ordination data. Pesetsky's evidence for each structure will be introduced in different sub-sections.

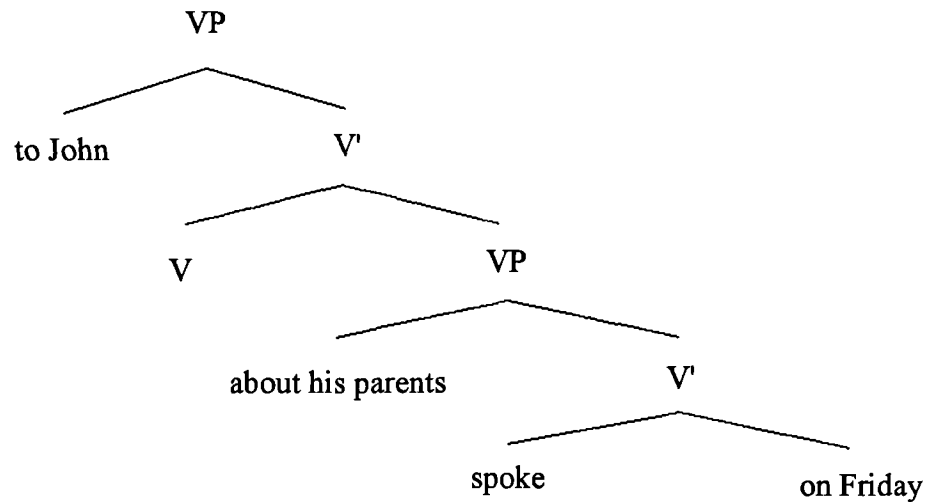
3.1.2.1 Evidence for radical right-branching

Let us consider the following example:

(51) Sue spoke to John about his parents on Friday.

Larson would assign to (51) the following sort of structure, similar to the VP shell in (20) above, where *to John* and *about his parents* are specifiers:

(52)



Co-ordination evidence straightforwardly favours (52):

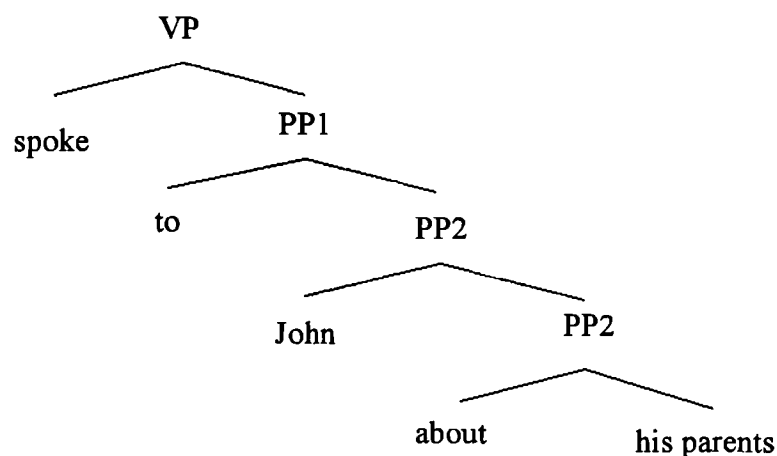
- (53) a. Sue spoke [[to John about his parents on Friday] and [to Mary about her parents on Saturday]].
- b. Sue spoke to John [[about his parents on Friday] and [about the match on Saturday]].

Each VP in (52) may be co-ordinated. The following data, though, suggests that the complements of the prepositions in (53) form constituents with the lower material, contrary to what is expected from (52):

- (54) a. Sue spoke [to [[John about his parents on Friday] and [Mary about the match on Saturday]]].
- b. Sue spoke to John [about [[his parents on Friday] and [the match on Saturday]]].

These latter cases cannot be derived from (52), since *John about his parents on Friday* and *his parents on Friday* are not constituents in that shell. Thus, Pesetsky proposes the following structure, which he terms a *Cascade*, where the "complements" of the prepositions are actually specifiers in the next projection down:

(55)



We would predict from (55) that the PP "complements" would also be able to c-command to their right, and this is what we find: (56a) is from (Pesetsky 1995: 172):

(56) *Anaphor Binding*

- a. Sue spoke to these people_i about each other_i's friends in Bill's house.
- b. *Sue spoke to each other_i's friends about these people_i.

(57) *NPI Licensing*

- a. Sue spoke to no linguist about any conference.
- b. *Sue spoke to any linguist about no conference.

(58) *Quantifier Binding*

- a. Sue spoke to each employee_i about his_i paycheck.
- b. ??Sue spoke to his_i friends about each employee_i.

(59) *Each...the other*

- a. Sue spoke to each employee_i about the other_i.
- b. *Sue spoke to the other_i about each employee_i.

(60) *Weak Crossover*

- a. Which employee_i did Sue speak to t_i about his_i paycheck?
- b. *Which employee_i did Sue speak to his_i friends about t_i?

(61) *Superiority*

- a. Which employee did Sue speak to t about what?
- b. *Which paycheck did Sue speak to who about t?

In order to prove that a c-command relation between the PP complements is obligatory, Pesetsky (1995: 177) cites Principle C data:

(62) *Sue spoke to him_i about Bill_i's mother.

The inference from (56)-(61) is only that a c-command relation between *John* and the lower PP in (52) is possible, not that it is obligatory. (62) makes just such a point. If the configuration indicated by (56)-(61) could be ignored, (62) would be predicted to be possible, contrary to fact. This re-inforces the proposal of structure (55).

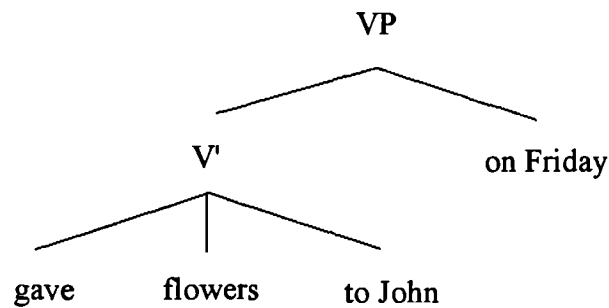
3.1.2.2 Evidence for left-branching

The problem with keeping just the Cascade structure in (55) is manifested by the following movement data:

- (63) a. *[To John on Friday] Sue spoke t.
b. [To John] Sue gave flowers t on Friday.

It would be predicted from (55), and also from Larson's (20), that *to John on Friday* should be able to move, since it is a constituent. Also, *to John* will not be a constituent in (55), with the result that (63b) should not be possible either. Thus, Pesetsky concludes that a second, left-branching structure should be available alongside the Cascade one, called a *Layered* structure:

(64)



To John can be raised on its own from (64), but not together with the adjunct, as required³.

Constituency evidence favours (64), such as the Partial VP Fronting data from Chapter 2:

- (65) a. Sue said she would give flowers to John on Friday, and [give flowers to John on Friday] Sue did.
- b. Sue said she would give flowers to John on Friday, and [give flowers to John] Sue did [on Friday].
- c. *Sue said she would give flowers to John on Friday, and [give flowers] Sue did [to John] [on Friday].

The entire VP in (64) may be fronted, as can V'. *Give flowers* is not a constituent, hence the ungrammaticality of (65c). The Layered and Cascade structures do not compete with each other, but are generated in parallel. The Cascade one is where c-command relations and also co-ordination possibilities are determined. The Layered version is the underlying structure for XP-movement.

In order to justify allowing VPs to have left-branching and right-branching properties simultaneously, we ought to ask is whether there is any syntactic environment where the distinction between the input structure for movement processes (derived from Layered structures) and that for binding (derived from Cascade structures) is blurred. One such environment is Partial VP Fronting. Consider the following example:

(66) Sue spoke to Bill about his mother.

The Principle C data from (62) above suggests that (66) has a right-branching structure where *to*'s complement c-commands to its right:

(62) *Sue spoke to him_i about Bill_i's mother.

Partial VP Fronting data, on the other hand, suggests a left-branching structure:

(67) [Speak to Bill] Sue did [about his mother].

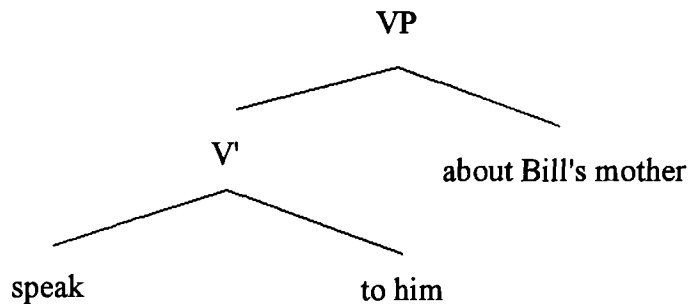
One would expect the Principle C violation of (62) to be nullified in the Partial VP Fronting environment (67), since *him* should not be able to c-command out of the fronted VP. However, this is not the case:

(68) *[Speak to him_i] Sue did [about Bill_i's mother].

³ See Chapter 4 for a more detailed discussion of such examples.

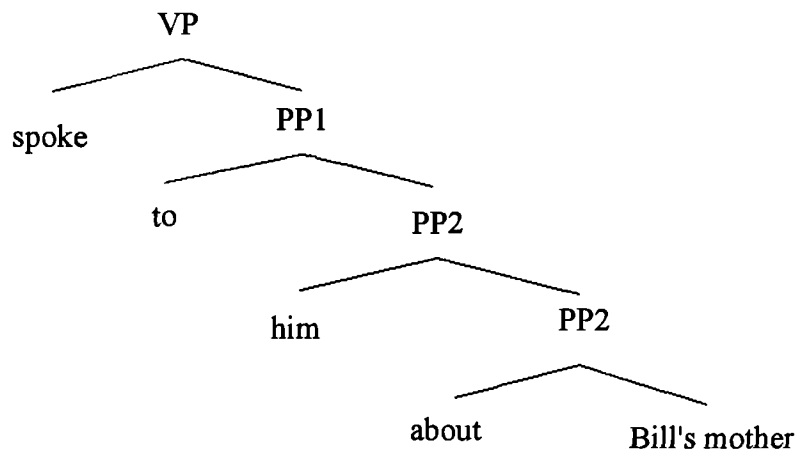
The possibility of Partial VP Fronting is derived from the following Layered VP:

(69)



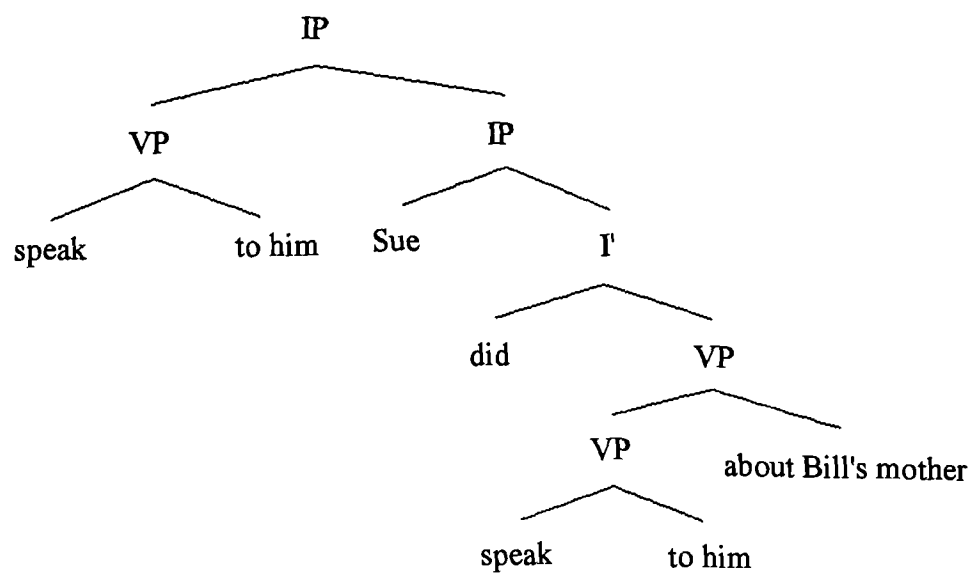
While the Principle C violation of (62) is derived from the following Cascaded VP structure:

(70)

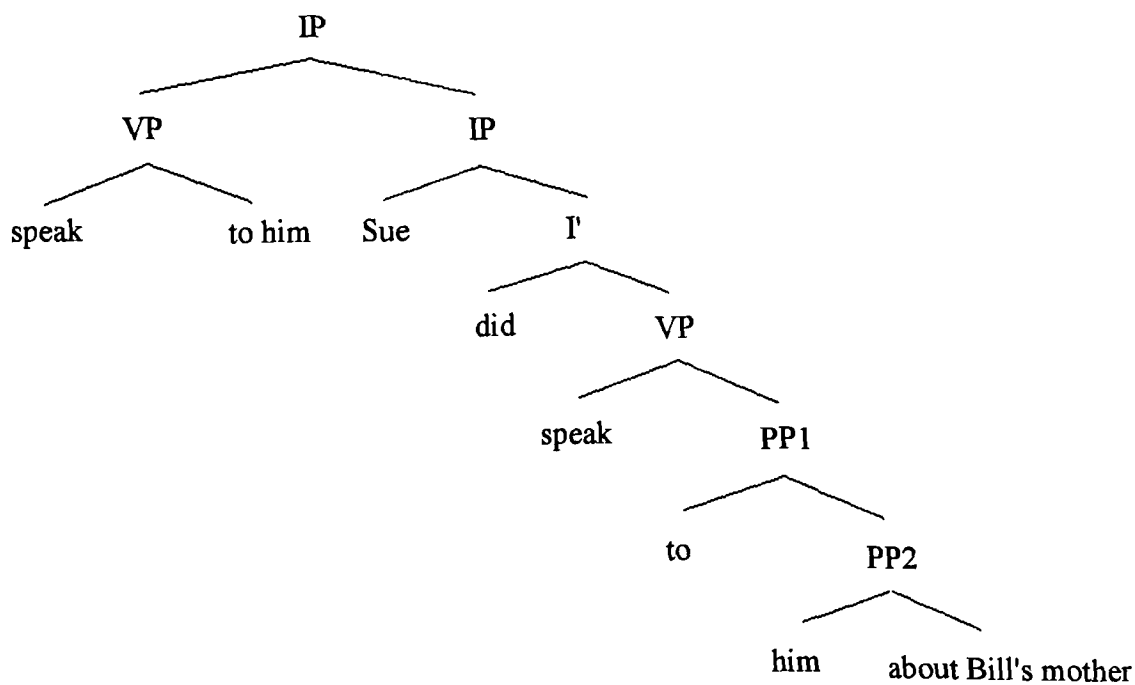


How does Pesetsky explain the fact that Principle C is still violated in (68)? He takes the view that the two types of structure are forced to tag along with one another, including when movement processes take place. Thus, the Cascade structure in (71b) for (68) parallels the Layered (71a) in having the predicate fronted:

(71) a.



b.



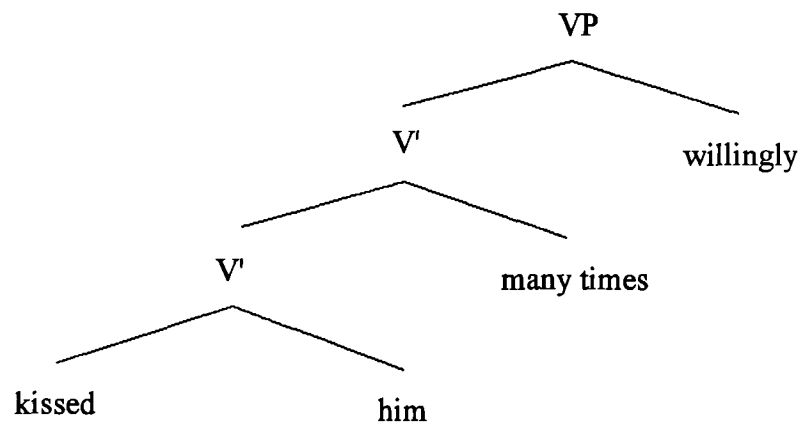
The binding relations are still maintained in (71b) while a VP constituent is fronted in (71a), and (68) is predicted to be ungrammatical.

Let us consider how Pesetsky would deal with Ernst's (1994) scope data, the first set of which is given below:

- (39) a. She kissed him many times willingly.
 b. She kissed him willingly many times.

Recall that (39a) is ambiguous, since *many times* may take scope over *willingly* or vice versa, while (39b) is unambiguous, with *many times* only able to take scope over *willingly*. Pesetsky argues that scope relations are read off of Layered structures. Consider such a structure for (39a):

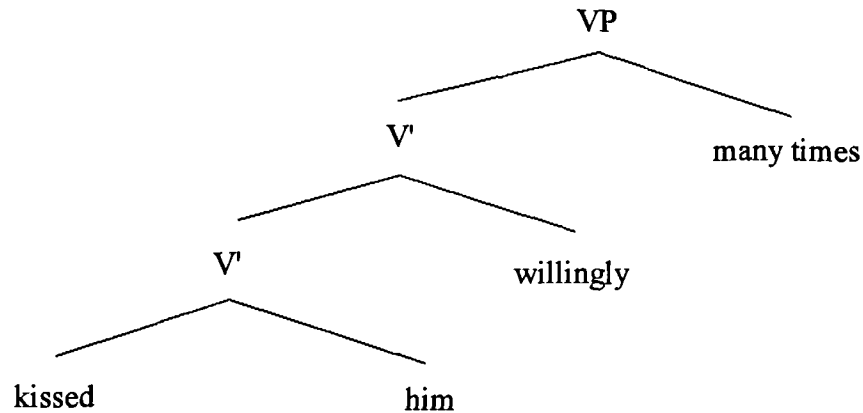
(72)



Willingly takes scope over the quantifier in (72). The latter can also raise covertly, resulting in the inverse scope reading. Thus (39a) is predicted to be ambiguous, as required.

The Layered structure for (39b) is:

(73)



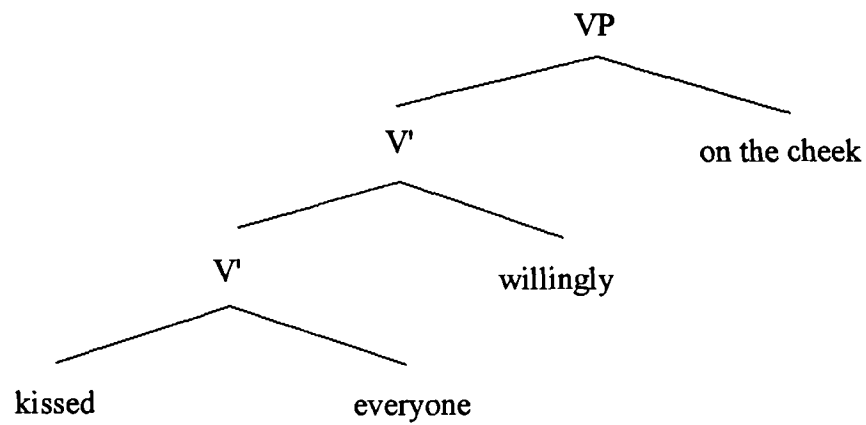
Many times can only raise further over *willingly*, and so ambiguity can never result. Adopting left-branching Layered structures as the locus for scope readings allows Pesetsky to derive the contrast in (39).

Let us now consider the other cases of Ernst's:

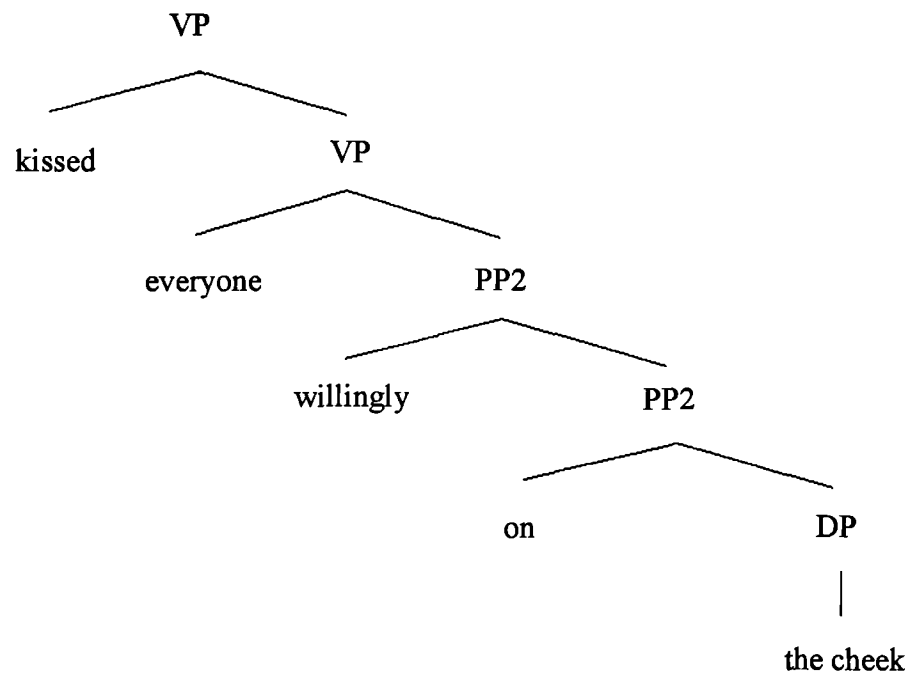
- (43)
- a. She insulted both suitors_i on purpose in each other_i's presence.
 - b. She took none of them on purpose for any reason I'm aware of.
 - c. She kissed everyone_i willingly on his_i cheek.

The quantifier may take scope over the adverbials or vice versa, but there is also the c-command relation between the quantifier and anaphor, etc. to contend with. Consider the Layered and Cascade structures for (43c) for illustration:

(74) a.



b.



The Layered structure (74a) will allow the adjuncts to take scope over *everyone*, or *everyone* to raise over them to leave the inverse reading, as required. Given that the Cascade structure (74b) is generated in parallel, the additional c-command effect exhibited in (43) is possible, as was the case when Principle C was violated in a Partial

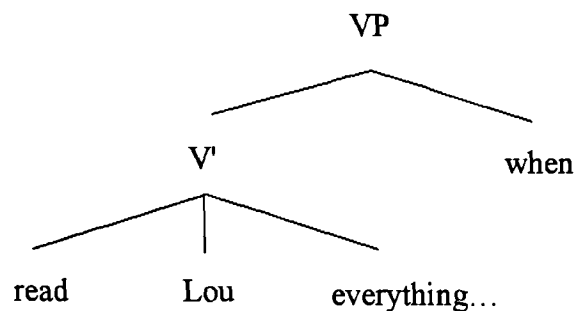
VP Fronting environment in (70). Thus, both sets of Ernst's data can be derived by Pesetsky.

Now let us consider Stroik's (1996) data on adverbials:

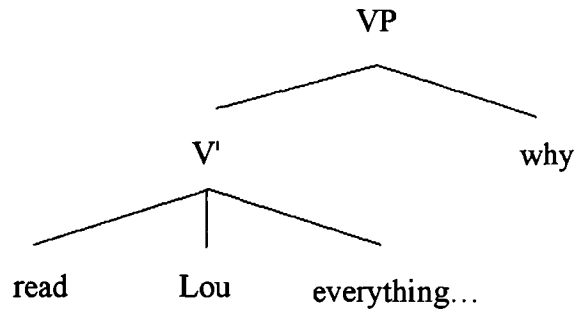
- (45) a. When did Mary read Lou everything Bill did?
 b. Where did Mary read Lou everything Bill did?
 c. Why did Mary read Lou everything Bill did?
 d. How did Mary read Lou everything Bill did?

Examples (45a,b) allow an interpretation where Mary's reading and Bill's reading take place at the same time or place. A parallel reading is not available for (45c,d). Presumably, this LF effect will be derived from the Layered structure, as the scope data above was. Consider such structures for (45a) and (45c) in (75):

(75) a.



b.



Let us assume that the phrase headed by *everything*, which also contains *did*, raises out of the VPs in (75). Then the remaining VP will be copied into *did*'s position at LF. Since the adverbials are present in both VPs in (75), we would not expect there to be a difference in readings in (45). Thus, Pesetsky has a problem with Stroik's data, as Larson did.

Despite this last set of data, a dual representation approach appears to be able to handle the contradictory c-command and structural requirements on VPs. Whether such a proposal is the optimal way of doing this is a question that has been raised by Phillips (1996), whose work we now turn to.

3.1.3 A right-branching approach to left-branching constituency

Phillips (1996) has argued that, conceptually, Pesetsky's solution to the constituency versus c-command data problem is not ideal, since descriptive adequacy is bought at the expense of a dubious complication to the theory. As I stated in the introduction to the thesis, the ideal minimalist approach to phrase structure would allow only one representation to be generated for each string of lexical items. Phillips argues that VPs

are mostly right-branching, and that evidence for left-branching from syntactic constituency tests can be brought into the reach of such a theory by making certain assumptions about how syntactic structures are built. He proposes that syntax is derived top-down and from left-to-right under a principle, *Merge Right*:

(76) *Merge Right* (Phillips 1996: 24)

New items must be attached at the right edge of a structure.

An economy metric ensures that the most right-branching attachment possible is chosen:

(77) *Branch Right* (Phillips 1996: 29)

Metric: select the most right-branching available attachment of an incoming item.

Reference set: all attachments of a new item that are compatible with a given interpretation.

Let us consider how Phillips derives the Principle C violation in (62):

(62) *I spoke to him_i about Bill_i's mother.

Spoke, *to* and *him* can be merged, with the latter two items as the complement of V:

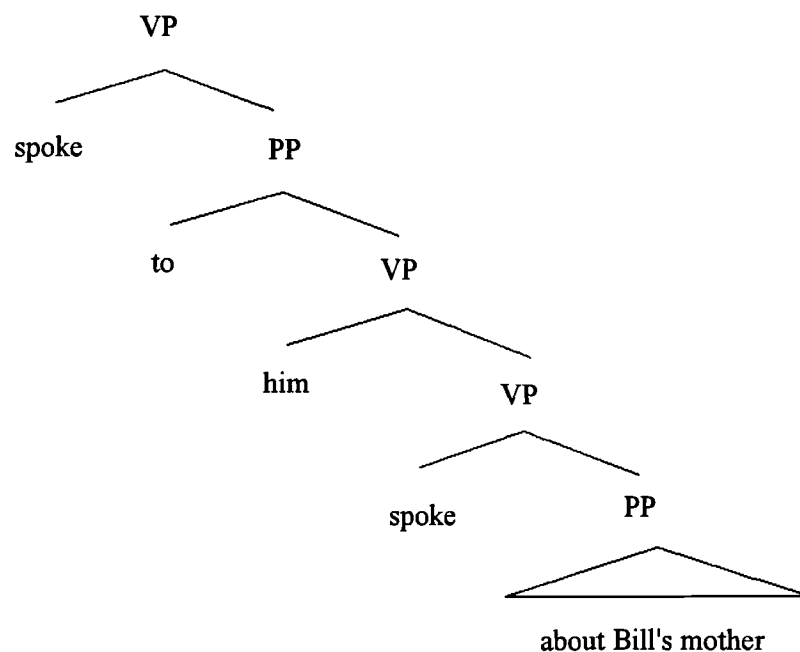
(78) [_{VP} spoke [_{PP} to [_{DP} him]]].

The *about*-PP will be licensed in a VP shell-like structure by copying *spoke*, and merging that with (78). Then *him* is restructured as the specifier of the lower copy, which will explain the Principle C violation:

(79) [VP spoke [PP to [VP [DP him] spoke]]].

Finally, the *about*-phrase is merged as the complement of the copy of *spoke* in (79), resulting in (80) as the final structure:

(80)



It can be seen from (80) that *him* c-commands *Bill*, and therefore co-indexing them will be impossible.

Let us now turn to (68), where the Principle C is still violated in the Partial VP Fronting environment:

(68) *[Speak to him_i] Sue did [about Bill_i's mother].

The structure after merging the fronted VP with *Sue did* is:

(81) [_{IP} [_{VP} Speak [_{PP} to [_{DP} him]]] [_{IP} Sue did]].

The "movement" of the predicate is licensed by copying the fronted constituent, and merging it as the complement of *did* in (81):

(82) [_{IP} [_{VP} Speak [_{PP} to [_{DP} him]]] [_{IP} Sue did [_{VP} speak [_{PP} to [_{DP} him]]]]].

The rest of the structure will be formed in the same way as (62) was. Crucially, once movement of *speak to him* has been licensed, *him* need not remain as the complement of *to* throughout the derivation, and *him* can be restructured to allow it to c-command *Bill*:

(83) [_{IP} [_{VP} Speak [_{PP} to [_{DP} him]]] [_{IP} Sue did [_{VP} speak [_{PP} to [_{VP} [_{DP} him] speak [_{PP} about Bill's mother]]]]]]].

Thus, the fact that the c-command relationship between *him* and *Bill* is preserved even in a, at first sight, purely left-branching environment can be derived under Phillips' analysis.

Now let us consider the first set of data from Ernst (1994):

- (39) a. She kissed him many times willingly.
 b. She kissed him willingly many times.

It appears at first sight that Phillips has the same problem with this contrast that Larson (1988a) had. Consider right-branching structures for (39):

- (84) a. [_{VP} kissed [_{VP} [him] kissed [_{VP} [many times] kissed [willingly]]].
 b. [_{VP} kissed [_{VP} [him] kissed [_{VP} [willingly] kissed [many times]]].

Many times can raise over *willingly* in (84b), suggesting that (39b) should be ambiguous, contrary to fact. However, the reverse cannot happen in (84a), suggesting that (39a) is unambiguous, again contrary to fact. Phillips argues that a left-branching structure may be generated under his Branch Right economy metric when the interpretation which that left-branching structure encodes differs from that encoded by a right-branching alternative. Consider right-branching and left-branching structures for (39a):

- (85) a. [_{VP} kissed [_{VP} [him] kissed [_{VP} [many times] kissed [willingly]]].
 b. [_{VP} [_{VP} [_{VP} kissed him] [many times]] [willingly]].

Both the quantifier *many times* and the adverbial have scope-taking properties, therefore (85a) and (85b) differ in their interpretation, and Branch Right will not force the choice of the right-branching (85a)⁴. Allowing both types of structure to be generated explains the ambiguity of (39a), since *willingly* takes scope over *many times* in (85b) in contrast to the situation in (85a). Phillips' flexible system of structure

⁴ Wynn Chao (p.c.) suggests that an alternative explanation of these data is that *many times* receives either an internal reading with respect to the event itself, or an external viewpoint reading from a single representation.

generation allows us to derive the contrast in (39) which was problematic for Larson (1988a).

Consider now the other data from Ernst (1994):

- (43) a. She insulted both suitors_i on purpose in each other_i's presence.
b. She took none of them on purpose for any reason I'm aware of.
c. She kissed everyone_i willingly on his_i cheek.

Here, too, the ambiguity remains, along with the added c-command requirements.

Consider a right-branching structure for (43c):

- (86) [_{VP} kissed [_{VP} [everyone] kissed [_{VP} [willingly] kissed [on his cheek]]]]].

As expected, *everyone* can bind *his* in (86). But the problem remains that *willingly* needs to be able to raise over *everyone* in order to derive the scope ambiguity. Thus, a left-branching structure like that in (87) is suggested:

- (87) [_{VP} [_{VP} [_{VP} kissed everyone] willingly] on his cheek].

Since *everyone* can undergo Quantifier Raising in (87), the requisite c-command relationship between *everyone* and *his* is possible. Therefore, Phillips can cope with both the c-command requirement on (43) and the scope possibilities.

Stroik's (1996) data on adverbials is still a problem for Phillips, as it was for Larson:

- (45) a. When did Mary read Lou everything Bill did?
 b. Where did Mary read Lou everything Bill did?
 c. Why did Mary read Lou everything Bill did?
 d. How did Mary read Lou everything Bill did?

Consider the left-branching structure in (88)

- (88) [Mary [_{VP1} [_{VP2} read Lou everything] why/how] [Lou did]].

It may be possible to copy the node marked VP2 to replace *did* at LF, resulting in the required interpretation:

- (89) [Why/how did Mary [_{VP1} [_{VP2} read Lou everything] t]
 [Lou [_{VP2} read Lou everything]]].

However, it is not clear how one could prevent such a derivation for (45a,b), which would result in an interpretation they do not have.

An approach which allows both right-branching and left-branching structures to be generated, but which generates only one representation for each sentence, is more in the spirit of the Minimalist Program than one where both types of structure are generated simultaneously. We have seen that the contradiction between the results of the c-command and constituency tests may be explained when right-branching syntactic structures are generated from left-to-right and top-down. The only problems a single representation system has that a dual one does not is Ernst's (1994) data in

(43) where, in a single example, scope relations between adverbials and quantifiers suggest a left-branching structure while a c-command requirement on NPI Licensing, etc. suggests a right-branching one. I would speculate that a right-branching structure is more likely to be correct for these cases. There are strong syntactic reasons for the c-command requirement on NPI Licensing, so maybe it is the theory of scope that is at fault – I leave this for later research. Let us now round off the debate in this and the previous chapter regarding VP structure.

3.2 Evaluation of the structural debate for Verb Phrases

We have identified a contradiction in the results of the tests on VP structure investigated in this and the previous chapter. In Chapter 2, we saw that constituency tests appeared to suggest a left-branching structure, while c-command and co-ordination ones in this chapter favoured a right-branching one. Pesetsky (1995) proposed that both a left-branching and a right-branching structure were generated simultaneously for each VP, and we saw that this approach could deal with the above contradiction, and with data on scope. Phillips (1996), on the other hand, argued that just having a right-branching structure was conceptually a more elegant solution than Pesetsky's, and demonstrated that most of the test results suggesting left-branching could be derived from his structure, given some ancillary assumptions about how syntactic structures are generated. Phillips allowed a left-branching structure where the interpretation it encoded was different from that encoded in a right-branching structure, and could thereby explain most of the scope data. Given that this is more in the spirit of the Minimalist Program, I will therefore adopt Phillips' right-branching structure for VPs. The discussion here suggests that Kayne's (1994) proposal that phrase structure can only be right-branching is too strong.

Let us now consider whether there is evidence for right-branching in degree constructions. One of the sets of data we examined in Chapter 2 concerned degree word scope. We saw evidence which suggested that degree satellites were right-adjoined to the matrix clause under a wide-scope reading, while under a narrow-scope reading, they could not be base-generated as clausal adjuncts. However, a structure involving right-adjunction is not the only way of encoding wide-scope. Kayne (1994) has proposed a right-branching structure which we will consider in §3.3.1. An

alternative treatment of satellites was proposed by Baltin (1987). He argued that the contradictory requirements on degree heads of their scope-taking and selectional properties necessitate a dual structure approach. We will also examine co-ordination analyses. Let us consider these proposals now.

3.3 Right-branching approaches to degree word scope

3.3.1 A purely right-branching approach

Recall that we presented evidence in Chapter 2 that degree words have scope-taking properties. The following sentences exemplify this:

- (90) a. Susan said John was so stupid that he got angry.
b. Susan said John was taller than he really was.

The examples in (90) have a wide-scope reading, namely that Susan's statement that John was crazy to a high degree caused him to get angry for (90a), or that John was tall to some degree but Susan said he was taller for (90b). Kayne (1994: 126-128) proposes a right-branching treatment of degree constructions: it was actually made with extraposition data in mind, but can be easily extended to (90). Consider the following structures encoding wide-scope:

- (91) a. [CP₂ [CP₁ Susan said John was so stupid] [CP₂ that he got angry]].
b. [CP₂ [CP₁ Susan said John was taller] [than he really was]].

In (91), the satellite is the main clause, with the remainder of the sentence as its specifier. These structures explain the Principle C data below:

- (92) a. Susan said he_i was so stupid that $John_i$ got angry.
b. Susan said he_i was taller that $John_i$ really was.

He would not c-command *John* in (91a) nor in (91b), and so we would expect to be able to co-index them.

There are problems with (91), though. Firstly, the "matrix clause" is headed by a Complementizer, which is the typical head of a subordinate clause. Also, the clause in the specifier of the matrix clause itself exhibits properties indicative of a matrix clause, e.g. subject-auxiliary inversion:

- (93) a. Did Susan say that John was so stupid that he got angry?
b. Did Susan say that John was taller than he really was?

As a finite subordinate clause, CP1 of (91) would be expected to have a Complementizer obligatorily:

- (94) [*(That) John was here] was a great surprise.

I therefore reject (91) as the structure for the wide-scope reading of degree words.

Now let us consider a possible right-branching treatment of the following narrow-scope examples:

- (95) a. Susan said John was so stupid that he had left his keys at home.
 b. Susan said John was taller than he used to be.

Kayne proposes the following base-generated structures:

- (96) a. [Susan said [John was [[so stupid] that he had left his keys at home]]].
 b. [Susan said [John was [[taller] than he used to be]]].

The structures in (96) can explain the Principle C data in (97):

- (97) a. *Susan said he_i was so stupid that John_i had left his keys at home.
 b. *Susan said he_i was taller than John_i used to be.

Since Principle C is violated in (97), *he* would have to be able to c-command into the satellite, which they can do in (96). One further problem with (96b) concerns the extraction data for clausal comparatives we examined in Chapter 2. Recall that neither argument nor adjunct extraction are possible:

- (98) a. *What did John give flowers to more men than [Bill gave t to]?
 b. *In what manner did John speak openly with Susan about more men than [Bill spoke t with Mary about]?

We attributed these judgements to the adjunct status of the clausal comparative. In (96b), though, the comparative is a complement, and so we would expect extraction to be possible, contrary to fact. A further extraction problem is illustrated in (99):

- (99) a. Who did Susan say that John was [[so dependent on t] that he would forget his keys if they didn't remind him].
- b. Who did Susan say that John was [[more dependent on t] than he used to be].

If (96) were correct, *who* would be extracted out of a specifier which is usually assumed to result in a left branch violation.

All in all, I reject both of Kayne's right-branching structures. Let us now turn to a dual structure approach to degree constructions from Baltin (1987).

3.3.2 A dual approach

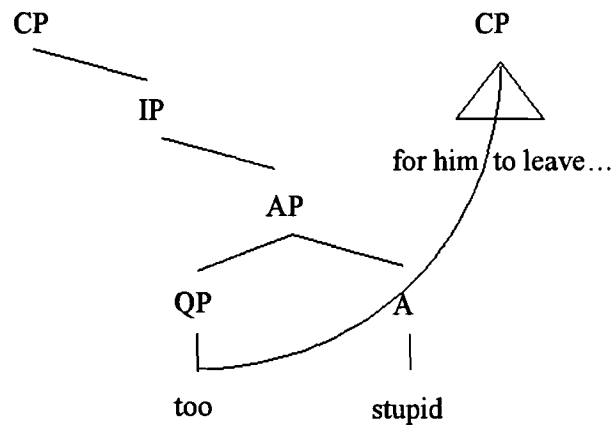
Baltin (1987) acknowledged the fact that there are contradictory requirements on result clauses, namely the scope-taking property of the degree head and the head's selectional needs. The latter requirement was argued by him to be exemplified by the extraction properties of the infinitival clause selected by *too*. Consider the following contrast:

- (100) a. What did Susan say that John was too stupid [to leave t at home]?
- b. *Where did Susan say John was too stupid [to leave his keys t]?

The difference between argument extraction in (100a) and adjunct extraction in (100b) suggests that there is a selection relationship between *too* and the result clause. Recall

that we argued that *too* has an inherently negative meaning, entailing that the result clause was a weak inner island. Baltin proposed a right-branching-like structure where the degree word selected the satellite to account for the facts above:

(101)

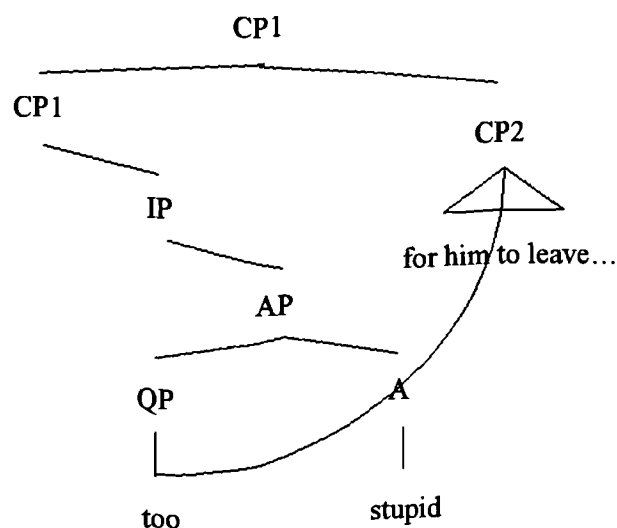


He also proposed that a right-adjoined structure like (102) was necessary to deal with the scope readings:

(102) [CP₁ [CP₁ Susan said [John was too stupid]] [CP₂ for him to leave his keys at home]].

Baltin suggests that the contradictory requirements of selection and scope could be encoded in a complex S-structure, effectively an amalgam of (101) and (102):

(103)



However, he argues that such a proposal cannot be maintained. Consider the following:

(104) They were partisan enough to convince each other.

The head-complement link between *enough* and the result clause will permit extraction, which we have already seen to be possible:

(105) Who were they partisan enough to convince t?

The problem with (103) comes from the relationship between *each other* and *they* in (104), which is mediated by a PRO subject in the result clause. This PRO, Baltin notes, is not in a position of obligatory control. Compare the following:

- (106) a. They were partisan enough [PRO_{arb} to convince them].
 b. *They want [PRO_{arb} to convince them].

While the arbitrary reading is possible in (106a), a similar case in (106b) does not admit the same interpretation. Thus, either PRO is not c-commanded by *they* in (104), or the specifier of the result clause contains an operator which blocks obligatory control. The latter effect is illustrated in (107):

- (107) I don't know [what PRO_{arb} to do].

Again, arbitrary control is still possible here. Recall that we argued in Chapter 2 that the satellite selected by *too* contained a null operator. Therefore this operator will allow PRO to have an arbitrary control reading. The same is not true for *enough*, though. Unfortunately, any definition of c-command, either using the first branching node or first maximal projection for reference, will predict that *they* does in fact c-command into the result clause, since CP2 is a complement to Q⁰ in (103). Therefore, Baltin rejects (103), and argues for a dual representation approach. Both (101) and the adjunction structure (102) are simultaneously generated, with the former being the input structure for movement processes; and the latter the one for binding relations.

Although Baltin's dual structure can account for the data, it suffers from the same drawback as Pesetsky's proposal: descriptive adequacy is bought at the price of seriously complicating the theory of phrase structure. A final set of right-branching approaches to degree word scope comprise treatments of them as co-ordinate structures. Let us consider these now.

3.3.3 Co-ordination approaches

One possibility that has been explored by a number of authors including Napoli (1983), Emonds (1985) and Donati (1997) is that the head of the comparative satellite, *than/as*, is a co-ordinator in structures like (108a) and (108b) for narrow-scope and wide-scope readings, respectively:

- (108) a. [CP Susan said Mary was [ConjP [DegP more tall] [ConjP than [CP she used to be]]]].
- b. [ConjP [CP Susan said Mary was more tall] [ConjP than [CP she really was]]].

Consider that a deletion process, namely Gapping, may be performed on clausal comparatives:

- (109) John ate more cakes than Bill, apples.

This type of data has lead many authors to propose a co-ordination analysis, since co-ordinate but not subordinate clauses may be gapped:

- (110) a. John ate cakes, and Bill, apples.
- b. *John saw Susan when Bill, Mary.

In Right Node Raising environments, we also see this contrast (Hendriks 1995: 54):

- (111) a. Paula admires # but Peter detests [paintings by Picasso].
 b. *Paula admires # although Peter detests [paintings by Picasso].
 c. More women admire # than men detest [paintings by Picasso].

Moltmann (1992), however, argues that such evidence is contradicted by syntactic extraction data, which suggests that *than/as* are subordinators. Thus she argues that clausal comparatives are syntactically subordinate while being semantically co-ordinate. Consider nominal comparatives first of all. Extraction data from White (1998: 494) indicates that a co-ordination analysis is not possible for them, since a constituent may be extracted from either conjunct separately, but not from both together:

- (112) a. Who is John more dependent on Susan [than t]?
 b. Who is John more dependent on t [than Mary]?

- (113) *Who is John more dependent on t [than t]?

Thus we may reject structure (108) for nominal comparatives.

Consider now clausal comparatives. Hendriks (1995: 59) cites the following as evidence for the co-ordinative character of *as*:

- (114) Which actor do as many men admire t as women detest t?

She states that apparent Across-The-Board extraction is the only way to admit extraction out of clausal comparatives. Hendriks (1995: 63) does acknowledge, though, that the following case can only be explained as an instance of subordination:

- (115) What kind of tv shows do men watch t as often as women watch soap operas?

I do not agree with Hendriks' conclusion that (114) is an instance of Across-The-Board movement, given that (115) is also possible. Compare this with data which indicates that the clausal comparative is a strong island:

- (116) a. *What did John give flowers to as many people as Mary gave t to?
 b. *How often did John give flowers to as many people as Mary gave flowers to t?

An explanation which could perhaps unify comparatives under one analysis is that *than/as* are subordinators, and (114) is a parasitic gap construction.

Moltmann proposes dual structures for comparatives, one subordinate and the other co-ordinate. One may object to this view for the same reasons as we objected to Baltin's proposal discussed above and Pesetsky's for VPs, namely that generation of a single syntactic representation is to be preferred. We may argue that a syntactically subordinate structure may be interpreted as if it were co-ordinate. Another instance of this is the semantics of adjuncts, as in the simple example *John saw me yesterday*. Higginbotham (1985) and Parsons (1990) argue that adjuncts are interpreted in the following way for the above example: "there is an event of John seeing me, and that

event occurred yesterday”. Therefore we have an instance of co-ordinate semantics, but the syntax is trivially subordinate.

Let us now turn to a possible co-ordination treatment of result clauses. Rijkhoek (1998) argues on the basis of extraposition data for a co-ordination analysis of Dutch result clauses which we will apply to English result clauses: the co-ordinating head is ":".

- (117) a. [CP Susan said John was [ConjP [DegP so stupid] [ConjP : [CP that he had left his keys at home]]]]. (narrow-scope)
- b. [ConjP [CP Susan said John was so stupid] [ConjP : [CP than he got angry]]]. (wide-scope)

Rijkhoek (1998: 170) cites data in support of co-ordination where extraction out of a finite result clause in Dutch is impossible. Compare an equivalent English case:

- (118) ?What was John so stupid that he had left t at home?

Recall, though, that we have identified an asymmetry between finite and infinitival result clauses with respect to extraction. Consider the following contrast:

- (119) ?What did Susan say John was stupid enough that he had left t at home?

- (120) a. What did Susan say John was too clever for him to leave t at home?

- b. What did Susan say John was stupid enough for him to leave t at home?

This evidence could only, really, be relevant for finite result clauses. Note further that there is also the possibility of extraction from within the AP from the following narrow-scope examples:

- (121)
- a. Who did Susan say John was so dependent on t that he couldn't criticise them?
 - b. Who did Susan say John was dependent enough on t that he couldn't criticise them?
 - c. Who did Susan say John was too dependent on t for him to be able to criticise them?
 - d. Who did Susan say John was dependent enough on t for him not to be able to criticise them?

Thus, each left “conjunct” in (117a) allows extraction. We saw in Chapter 2 that finite result clauses are islands, which we attributed to their being factives, hence the ungrammaticality of (118) and (119). All in all, there is little reason to analyse result clauses as co-ordinate structures.

Having eliminated right-branching approaches to degree word scope, we should consider whether a derivation like Phillips' (1996) one for VP shells can be adopted for degree constructions. This would be the best solution, since VPs and degree constructions would then have an identical derivation.

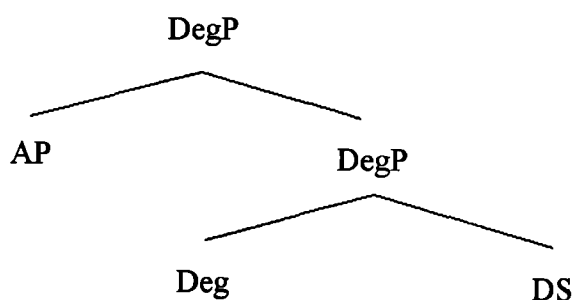
3.4 Evidence for radical right-branching in degree constructions

Recall once again the evidence suggesting that there is a selection link between the degree head and result clause satellite:

- (122) a. John was *(so) cold/cold *(enough) [that he started shivering].
b. John was *(too) cold [to move]/cold *(enough) [to start shivering].

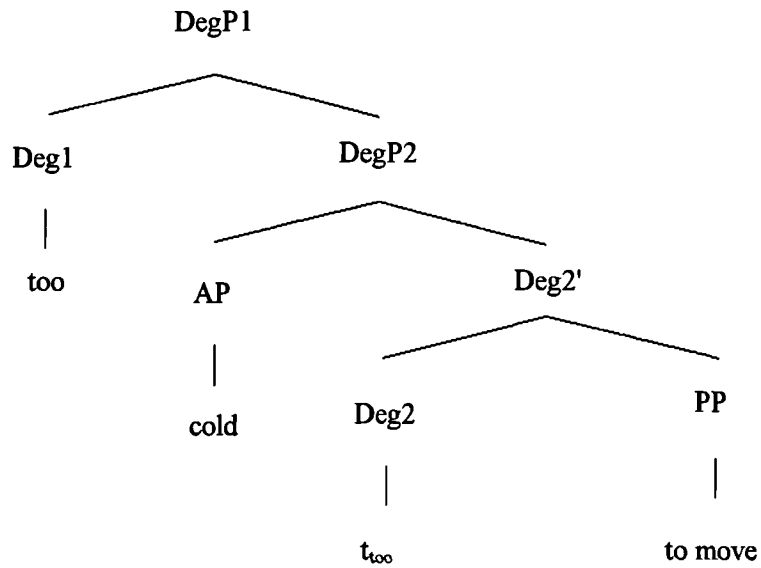
Let us examine the following right-branching structure, where the degree head will select both an AP and the relevant satellite (we will see later how a degree word which modifies AP selects the satellite):

(123)



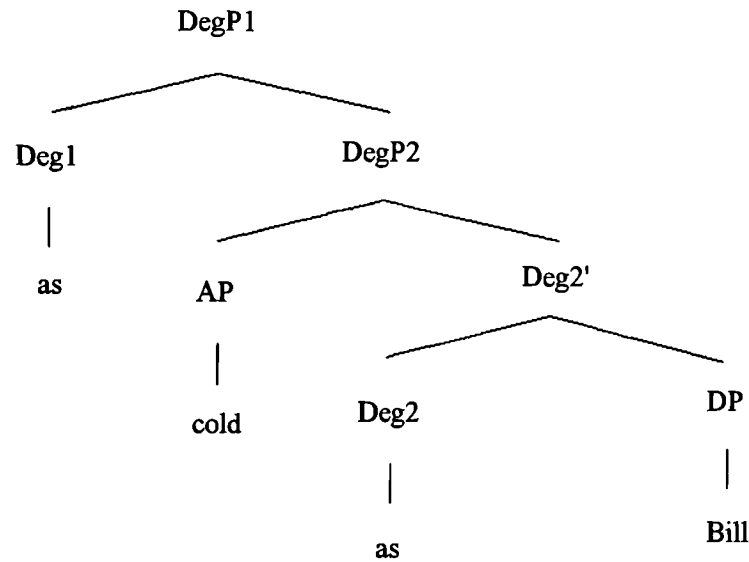
The discontinuity of some degree heads from their satellite lead White (1997) for result clauses, and lead Larson (1991) and Izvorski (1995) for comparatives, to propose a shell structure:

(124)



An alternative to (124) for comparatives was proposed in White (1998). *As...as* and *more...than*, etc. were seen as a semantic unit (cf. also Keenan 1987 for the same proposal), since *than/as* do not contribute to the meaning of the whole string. Therefore they may be seen as compound or discontinuous heads. This leads to the conclusion that they are syntactically the same category, Degree:

(125)



We saw in §2.2.2 that degree words have quantifier-like properties. It can be argued that (124) and (125) are the ideally minimalist representations of narrow-scope in a right-branching structure. The outer head, Deg1, takes scope over the predicate and satellite directly. Nothing needs to change at LF, therefore, if this is the required reading. Indeed we argued in that section that the satellite was in situ within the predicate under the narrow-scope reading.

Although not lacking in initial appeal, these proposals have the same problem as Larson's (1988a) VP shell proposal, namely the constituency data. Recall some of the data from Chapter 2:

(126) *Partial Predicate Fronting*

[As tall] Susan said Mary was [as she once was].

(127) *Cleft sentences*

It was [as tall] that Susan said Mary was [as she once was].

In neither (124) nor (125) does Deg1 and AP form a constituent, as required by (126)-(127). One potential solution to this problem would be to adopt a Phillips (1996)-style derivation, saying that these shells are constructed from left-to-right and top-down. Consider such a derivation for (128a), from the point shown in (128b):

- (128) a. Mary was as tall as John.
b. [IP Mary was [DegP as [AP tall]]].

Under White's proposal, the second part of the head, *as*, is merged with (128b). Then *tall* is restructured as the specifier of that head, and *John* is merged as *as*'s complement:

- (129) [IP Mary was [DegP as [DegP [AP tall] as John]]].

Now let us consider the Partial Predicate Fronting example (126). The structure resulting from merging the Degree Phrase with IP, and then copying the former into its base position is:

- (130) [IP [DegP as [AP tall]] [IP Susan said Mary was [DegP as [AP tall]]]].

Since "movement" has been licensed in (130), the constituent structure of the copy can be changed, allowing us to license the comparative satellite as we did in (129):

- (131) [IP [DegP as [AP tall]] [IP Susan said Mary was [DegP as [DegP [AP tall]
as she once was]]]].

The rest of this chapter will be devoted to testing degree constructions to see if a radically right-branching structure is justified. The evidence cited by Pesetsky (1995) and Phillips (1996) for such structures revolved around PP splitting, i.e. the complement of a PP was seen to c-command into another constituent, or it and the string it c-commands could be a co-ordinate structure. There is a similar environment we can test in the degree construction domain, exemplified in (132):

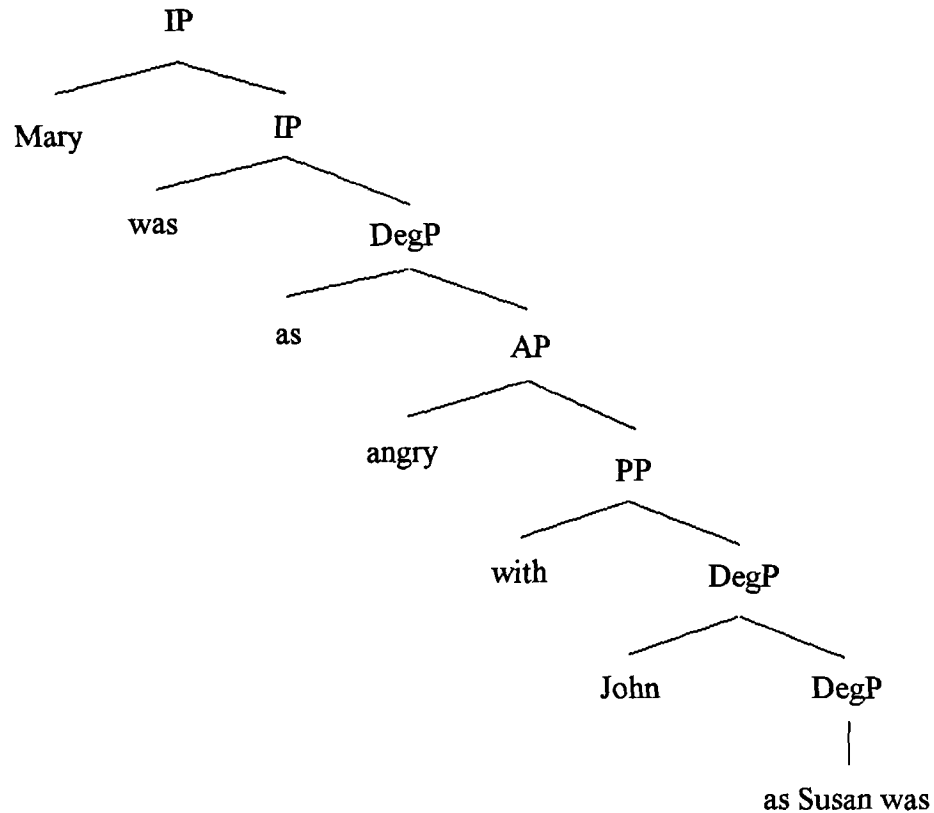
- (132) Mary was as angry with John as Susan was.

Let us consider how (132) may be formed under a Phillips-style derivation. The point we shall start from is given in (133):

- (133) [IP Mary was [DegP as [AP angry [PP with [DP John]]]]].

After merging *as* with (133), the question arises how much material is restructured. If we adopt the practise used with VPs, only *John* will be the specifier of *as*, resulting in the structure in (134):

(134)



We predict from structure (134) that *John* can c-command into the satellite, or it and the satellite can be a co-ordinated structure. These predictions will be tested in the following sub-sections, focussing solely on the narrow-scope reading. We have already seen evidence that the subject of an embedded clause may only c-command into the satellite under this reading, and not under the wide-scope one. Thus we need to test how right-branching the structure for the narrow-scope reading is.

3.4.1 Principle C

Let us consider some Principle C data for (134) :

- (135) a. Mary was so angry with him_i that John_i was afraid.
b. Mary was too angry with him_i for John_i to feel safe.
c. Mary was angry enough with him_i that John_i was afraid.
d. Mary was angry enough with him_i for John_i to feel threatened.
- (136) a. Mary was more angry with him_i than John_i expected.
b. Mary was angrier with him_i than John_i expected.
c. Mary was less angry with him_i than John_i expected.
d. Mary was as angry with him_i as John_i expected.

The evidence here does not point to (134) being correct. If these examples truly have a right-branching structure, co-indexing *John* and *him* should give rise to a Principle C violation. Since they are fully grammatical, we conclude that (134) must be incorrect.

3.4.2 Anaphor Binding

The environment in (134) will only allow the Anaphor Binding test to work for nominal comparatives, since there is a clause-boundedness constraint on anaphora which would exclude clausal comparatives and result clauses. It was shown in

Hoeksema (1983: 405) that an anaphor in a nominal comparative, but not one in a clausal comparative, may be bound by the matrix subject:

(137) No man_i is stronger than himself_i (*is).

The data based on (134) is:

- (138) a. *Mary is more angry with John_i than himself_i.
(=Mary is more angry with John than himself (=John) is angry with John)
b. *Mary is angrier with John_i than himself_i.
c. *Mary is less angry with John_i than himself_i.
d. *Mary is as angry with John_i as himself_i.

Under the intended reading, *John* and *himself* may not be co-indexed. This data suggests that (134) is incorrect.

3.4.3 Negative Polarity Item Licensing

Only a very restricted sub-set of degree constructions may be tested for NPI Licensing.

Linebarger (1980) noted that comparatives are NPI Licensing environments in their own right:

- (139) a. Mary was more angry than anyone (was).
b. Mary was angrier than anyone (was).
c. Mary was less angry than anyone (was).
d. Mary was as angry as anyone (was).

As noted by Ladusaw (1979) and Rothstein (1991), *too* also licenses NPIs:

- (140) Mary was too angry to talk to anyone.

Thus, none of these cases can be tested.

The only remaining cases are *so* and *enough*. Consider the following data which suggests that they cannot license a polarity item themselves:

- (141) a. *Mary was so offensive that anyone left.
b. Mary wasn't so offensive that anyone left.

- (142) a. *Mary was offensive enough that anyone left.
b. Mary wasn't offensive enough that anyone left.

- (143) a. *Mary was offensive enough to cause anyone to leave.
b. Mary wasn't offensive enough to cause anyone to leave.

Now consider the data:

- (144) a. *Mary was so offensive to no one that anyone left.
 b. *Mary was offensive enough to no one that anyone left.
 c. *Mary was offensive enough to no one for anyone to leave.

These suggest that (134) is not correct, since *no one* would be expected to license *anyone* in (144).

3.4.4 Quantifier Binding

The bound reading of *his* is only available in the Quantifier Binding environment when *each friend* c-commands *his*. Consider the data:

- (145) a. John was so angry with each friend_i that his_i companion got upset.
 b. John was too angry with each friend_i for his_i companion to speak.
 c. John was angry enough with each friend_i that his_i companion got upset.
 d. John was angry enough with each friend_i for his_i companion to get upset.
- (146) a. John was more angry with each friend_i than with his_i companion.
 b. John was angrier with each friend_i than with his_i companion.
 c. John was less angry with each friend_i than with his_i companion.
 d. John was as angry with each friend_i as with his_i companion.

These data do suggest that (134) is correct.

3.4.5 *Each...the other*

In a similar vein to the Quantifier Binding data above, the reciprocal reading is only possible when the *each*-phrase c-commands *the other*:

- (147) a. John was so angry with each man_i that the other_i got upset.
b. John was too angry with each man_i for the other_i to stay away.
c. John was angry enough with each man_i for the other_i to stay away.
d. John was angry enough with each man_i that the other_i got upset.
- (148) a. John was more angry with each man_i than the other_i.
b. John was angrier with each man_i than the other_i.
c. John was less angry with each man_i than the other_i.
d. John was as angry with each man_i as the other_i.

This suggests that (134) is correct.

3.4.6 Weak Crossover

We first need to recall when extraction is possible out of degree constructions. Let us look at result clauses:

- (149) a. ?Who was John so angry [that he shouted at t]?
b. Who was John too angry [to talk to t]?
c. Who was John angry enough [to talk to t]?
d. ?Who was John angry enough [that he shouted at t]?

Since extraction is fully grammatical out of infinitival result clauses alone, we can only test them. Unfortunately, if we consider the relevant environment with the PP complement to A, we see that extraction is downgraded here too. Consider the following:

- (150) a. ?Who was John too angry with Bill [to talk to t]?
b. ?Who was John angry enough with Bill [to talk to t]?

Therefore, the Weak Crossover test cannot be performed on result clauses at all.

Recall that there is a distinction with respect to the extraction possibilities from comparative phrases. Extraction is possible out of the nominal comparative, but not the clausal ones:

- (151) a. Who was John more angry than t?
b. *Who was John more angry with Bill than [(what) he was with t]?

As we saw with infinitival result clauses, extraction from the relevant environment of nominal comparatives is downgraded as well:

- (152) a. *Who was John more angry with Bill than with t?
 b. *Who was John angrier with Bill than with t?
 c. *Who was John less angry with Bill than with t?
 d. *Who was John as angry with Bill as with t?

We cannot therefore use the Weak Crossover test.

3.4.7 Superiority

The same considerations concerning the environment of Superiority apply as for the Weak Crossover cases above. Since extraction out of the environment we want to test is ungrammatical, we cannot test Superiority sentences.

3.4.8 Co-ordination 1

Under structure (134), the complement of the PP and the satellite are a constituent. Therefore, one would expect that they could be co-ordinated. Consider the following data:

- (153) a. *Mary was [so angry with [[John that she did no work] and [Susan that she shouted]]].
 b. *Mary was [too angry with [[John to do any work] and [Susan to care]]].

- c. *Mary was [angry enough with [[John that she did no work and [Susan that she shouted]]]].
 - d. *Mary was [angry enough with [[John to do no work] and [Susan not to care]]]].
- (154)
- a. *Mary was [more angry with [[John than with Susan] and [Peter than with Bill]]]].
 - b. ✕ Mary was [angrier with [[John than with Susan] and [Peter than with Bill]]]].
 - c.. *Mary was [less angry with [[John than with Susan] and [Peter than with Bill]]]].
 - d. *Mary was [as angry with [[John as with Susan] and [Peter as with Bill]]]].

The very clear prediction of this data is that (134) is incorrect.

3.5 Summary of the test results

In tabulated form, the results for degree satellites are as follows (RRB=Radical Right-Branching):

(155)

Principle C (§3.4.1)	*RRB
Anaphor Binding (§3.4.2)	*RRB
Negative Polarity Item Licensing (§3.4.3)	*RRB
Quantifier Binding (§3.4.4)	RRB
<i>Each...the other</i> (§3.4.5)	RRB
Weak Crossover (§3.4.6)	N/A
Superiority (§3.4.7)	N/A
Co-ordination 1 (§3.4.8)	*RRB

There is some contradictory evidence regarding whether Phillips-style radical right-branching structures like (134) are correct, with some favouring it and most not. Let us consider the data that appear to favour it again.

3.6 Problematic data

There were two sets of test data which suggested that the radically right-branching structure (134) was correct, namely Quantifier Binding and *Each...the other*. These environments, though, may not be true tests of c-command, as argued by Williams (1994), contra Reinhart (1983). Consider the following (Williams 1994: 234):

- (156) a. Everyone_i loves his_i mother.
b. Everyone_i's mother loves him_i.

The bound pronoun reading on *him* is not simply due to c-command, as we might think (156a) shows. In (156b), *everyone* does not c-command *him* at all, yet the bound reading is available. Further evidence comes from Neeleman and van de Koot (1999: 33):

- (157) a. Every soldier_i goes home in the weekend. This allows him_i to see his wife.
b. Statistics show that his_i abuse of drugs causes every third soldier_i to be less alert on the battlefield.
c. Every soldier_i told every girl_j that they_{i+j} had to leave soon.
d. Every soldier_i said that the captain explained why the general refused him_i leave.

They argue that relations that do not exhibit the properties of *the configurational matrix*, namely that once a dependent element is introduced it must have an antecedent; that there can only be one antecedent; that the dependent has a c-commanding antecedent; and that the relation between dependent and antecedent is local, cannot be syntactic relations. This data shows that a “bound” pronoun need not have an antecedent in the same sentence, (157a); a “bound” pronoun need not have a c-commanding antecedent, (157b); a “bound” pronoun can have more than one antecedent, (157c); the relation between a “bound” pronoun and its antecedent need not be local, (157d).

A similar contrast is also apparent in the *Each...the other* test:

- (158) a. Each man likes the other.
 b. Each man's dog likes the other's one.

Once again, no c-command relationship exists between the *each* phrase and *the other* in (161b). Consider also:

- (159) a. Each soldier_i decided to leave early. This allowed the other_i to finish his drink.
 b. Because each man_i was frightened, the other_i tried to calm him down.
 c. Each man_i said that the captain had explained why the general had refused leave to the other_i.

Once again, *each* and *the other* need not be in the same sentence, (159a); there need not be a c-commanding relation between *each* and *the other*, (159b); nor need the

relation between *each* and *the other* be local, (159c): note that *the other* cannot be interpreted as being the antecedent of two *each*-phrases, so data equivalent to (157c) above cannot be provided. Therefore, the relation between *each* and *the other* may not be a syntactic one either. All in all it seems there is ample justification for calling into question the reliability of Quantifier Binding and the *Each...the other* construction as tests for c-command. This gives rise to the following table of results:

(160)

Principle C (§3.4.1)	*RRB
Anaphor Binding (§3.4.2)	*RRB
Negative Polarity Item Licensing (§3.4.3)	*RRB
Co-ordination 1 (§3.4.8)	*RRB

The very conclusive result of this discussion is that degree constructions cannot be radically right-branching, with (134) not being the correct structure.

3.7 Evidence for less radically right-branching degree constructions

We ought now to investigate whether degree constructions have a more standard shell structure. Let us consider whether the PP complement to A as a whole may be restructured in a structure like (161):

(161) [IP Mary was [DegP as [AP angry [DegP [PP with John] as Susan]]]].

Co-ordination data will be cited as evidence. The DegP in (161) could be co-ordinated.

Consider the following data for result clauses:

- (162) a. Mary was [so angry [[with John that she did no work] and [with Susan that she shouted]]].
- b. Mary was [too angry [[with John to do any work] and [with Susan to shout]]].
- c. Mary was [angry enough [[with John that she did no work] and [with Susan that she shouted]]].
- d. Mary was [angry enough [[with John to do any work] and [with Susan to shout]]].

Result clauses appear to have structure (161) for their narrow-scope reading.

Let us determine how the result clauses are selected by those degree words which are modifiers. Consider the case of *so*. After the AP and its complement have been merged, the structure in (163) results:

(163) [IP Mary was [AP [DegP *so*] [AP angry [PP with John]]]].

Now the result clause is merged with (163). It and the PP need to form a constituent as required by (162). Now, no copy of *so* may be dropped, and projected again, since it is

a non-head. Therefore, the satellite will be merged directly with PP in (163), leaving (164) as the surface structure:⁵

- (164) [IP Mary was [AP [DegP so] [AP angry [CP [PP with John] that she did no work]]]].

The question remains how the satellite is selected, since it is split off from DegP by an AP barrier. It appears we are forced to argue that the satellite raises covertly to adjoin to AP, resulting in the LF in (165):

- (165) [IP Mary was [AP [DegP so] [AP [AP angry t_{SAT}] [CP [PP with John] that she did no work]]]].

Now according to the Complement Principle we introduced in Chapter 2, which stated that a complement relation could be established between two phrases if one governed the other, DegP governs the satellite in (165). Therefore, so can select the satellite. Although this operation violates the economy principle Procrastinate, it is necessary under the assumption we have made in this thesis that result clauses are selected.

Consider now comparatives:

- (166) a. *Mary was [more angry [[with John than with Susan] and [with Peter than with Bill]]].
 b. *Mary was [angrier [[with John than with Susan] and [with Peter than with Bill]]].

⁵ We are forced, though, to posit an unattested structure where a PP is generated in a Spec, CP whose C head is filled.

- c. *Mary was [less angry [[with John than with Susan] and [with Peter than with Bill]]].
- d. *Mary was [as angry [[with John as with Susan] and [with Peter as with Bill]]].

Contrary to result clauses, it appears that comparatives do not have structure (161).

Let us consider one further right-branching structure for comparatives in (167):

(167) [IP Mary was [DegP more [[AP angry (with John)] than Susan]]].

We would expect an AP and satellite to be able to be co-ordinated if (167) were correct:

- (168)
- a. Mary was [more [tired than Susan] and [lazy than Bill]].
 - b. Mary was [[colder] and [warmer] than Susan].
 - c. Mary was [less [tired than Susan] and [lazy than Bill]].
 - d. Mary was [as [tired as Susan] and [lazy as Bill]].

The prediction of this data is that (167) may be correct for comparatives.

3.8 The left-branching/right-branching debate summarised

A final table of evidence for both radically right-branching and right-branching structures for degree constructions is given below (RB=right-branching):

(169)

Principle C (§3.4.1)	*RRB
Anaphor Binding (§3.4.2)	*RRB
Negative Polarity Item Licensing (§3.4.3)	*RRB
Co-ordination 1 (§3.4.8)	*RRB
Co-ordination (§3.7)	Comparatives-*(164)/(167) Result clauses-(164)

These two chapters have produced some very striking results regarding the constituency of VPs and degree constructions. The VP results were contradictory, although the balance was seen to come out in favour of a radically right-branching structure like Phillips' (1996) one.

Degree constructions exhibit the same constituency test results, namely that left-branching structures are suggested. As for the tests for right-branching, I have

argued that result clauses have the structure in (164) for their narrow-scope reading, while comparatives appeared to have structure (167).

Wide-scope readings for both types of degree construction were argued to have a structure where the satellite was right-adjoined to the matrix clause. Such a situation may be accommodated within Phillips' (1996) approach to syntactic structures. Unless left-branching structures are required for interpretive reasons, degree satellites are in right-branching structures.

Let us now turn in the final chapter of this thesis to some more evidence that VPs may have either a left-branching or a right-branching structure.

CHAPTER 4

CLUSTERING IN VERB PHRASES

4.0 The problem

Jackendoff (1973) has identified some sequences of PPs that act as constituents.

Consider the following:

- (1) a. I saw John *across the road from me*.
- b. John said he would wait *from now until eternity*.
- c. I looked *up the road at my house*.

Focussing the italicised sequences in Cleft sentences will show which of them are constituents:

- (2) a. It was [across the road from me] that I saw John.
- b. It was [from now until eternity] that John said he would wait.
- c. *It was [up the road at my house] that I looked.

The first two PP sequences are constituents, but not the third. PP constituents can also appear in subject position:

- (3) a. [Across the road from me] would be acceptable.
 b. Would [across the road from me] be acceptable?
- (4) a. [From now until eternity] would be acceptable.
 b. Would [from now until eternity] be acceptable?

As expected, the sequence in (1c) cannot:

- (5) a. *[Up the road at my house] would be acceptable.
 b. *Would [up the road at my house] be acceptable?

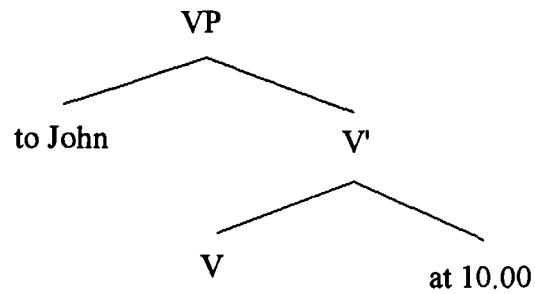
Thus, the examples in (2)-(5) suggest that the first two italicised sequences in (1) are constituents, while the third is not.

The conclusion that sequences of PPs may be constituents is natural in a theory according to which VPs have a right-branching structure, such as Larson (1988a) and Phillips (1996). If the verb occupies a position high in the shell after Spell-out to the left of a sequence of adjuncts, then the adjuncts form a constituent which does not include the verb (although it may include the verb's trace or copy).

In fact, as shown by Pesetsky (1995), such theories incorrectly also allow a PP argument and a PP adjunct to move together if they form a constituent. Consider (6b), the partial right-branching structure of (6a):

- (6) a. I gave flowers to John at 10.00.

b.

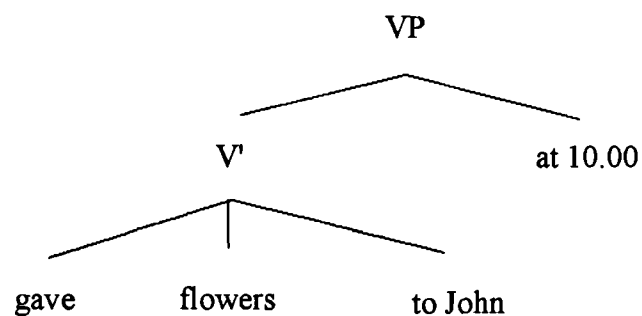


Contrary to expectations, the *to*-phrase cannot be extracted together with the adjunct PP:

(7) *To John at 10.00 I gave flowers t.

Pesetsky concluded from the evidence available to him that VPs do not only have a right-branching shell structure, but also a left-branching Layered structure which determines movement possibilities in his system:

(8)



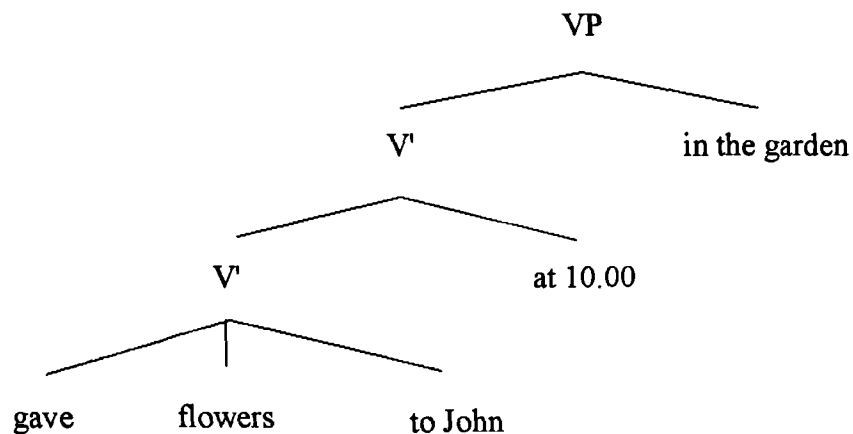
The argument and adjunct PPs do not form a constituent in the phrase marker in (8), and therefore would not be expected to move together.

Now consider the following:

- (9) At 10.00 in the garden I gave flowers to John.

If we can establish that *at 10.00 in the garden* forms a constituent, then (9) cannot be accommodated in a theory like Pesetsky's in which movement possibilities are computed off a left-branching structure, like (10) below:

(10)



There are, however, five possible methods by which the PPs could have got to the front of the clause:

- (11)
- a. Both are base-generated separately there.
 - b. One is base-generated, one is moved.
 - c. Both are moved separately.
 - d. Both are base-generated as a constituent,
 - e. Both are moved together as a constituent.

The first three options deny that *at 10.00 in the garden* is a constituent. They may be rejected because of the following c-command data:

- (12) a. At no time in any garden did I give flowers to John.
b. *At any time in no garden did I give flowers to John.

If the PPs are not a constituent, neither prepositional complement can c-command the other, contrary to the evidence in (12)¹. This result is confirmed by the co-ordination data in (13):

- (13) [At [[10.00 in the garden] and [11.00 at home]]] did I give flowers to John.

Although the PPs may be focussed individually in Cleft sentences, both can be focussed together as well, suggesting that *at 10.00 in the garden* may indeed be a constituent:

- (14) a. It was [at 10.00] that I gave flowers to John in the garden.
b. It was [in the garden] that I gave flowers to John at 10.00.

- (15) It was [at 10.00 in the garden] that I gave flowers to John.

¹ The reader may be wondering whether these clusters are co-ordinated constituents where the mediating head is null

- (i) [[at 10.00] (and) [in the garden]].

The c-command data in (12) allows us to immediately reject this alternative, since the complement of the first "conjunct" could not c-command that of the second. The same is also true of the co-ordination data of (13).

We may, therefore, reject options (11a-c).

Options (11d) and (11e) treat the PPs in (9) as a constituent, either base-generated at the front of the clause, or moved there. Let us consider some evidence that they are moved:

- (16) At 10.00 in the garden I gave flowers to John, and Mary did too.
 (=Mary gave flowers to John at 10.00 in the garden)

The adjuncts in (16) act as if they are within the VP, which confirms that the PPs must have moved from within the VP.

Some more evidence in favour of this conclusion comes from the following extraction data:

- (17) a. *What did I believe that at 10.00 in the garden I had given t to John?
 b. *Who did I believe that at 10.00 in the garden I had given flowers to t?

The PPs trigger a strong island violation. Compare this with (18) below, where a sentential adjunct, which will presumably be base-generated sentence-initially, does not trigger a comparable degradation in grammaticality:

- (18) a. What did I believe that habitually I had given t to John?
 b. Who did I believe that habitually I had given flowers to t?

The contrast between (17) and (18) suggests that, in the former, *at 10.00 in the garden* has been topicalised, thus forming a strong island. Due to this evidence, we may reject option (11d). Thus we conclude that (11e) is correct, and that the PPs in (9) have been moved as a constituent. This conclusion confirms that (9) is a problem for a theory of VP structure like Pesetsky's, where VP adjuncts do not form a constituent for movement purposes.

We have concluded that the PP clustering data present a challenge for theories of VP structure. While a left-branching VP structure correctly rules out the possibility of a sentence-initial cluster containing an argument, it fails to account for the occurrence of such clusters consisting only of adjuncts. Exactly the opposite is true of a right-branching VP structure. This apparent contradiction is resolved in the next section.

4.1 Restrictions on clustering

We have already seen that a temporal PP *at 10.00* and a location PP *in the garden* can cluster in (9). Indeed, three or more location and temporal PPs may act like this:

- (19) a. I gave flowers to John *on Tuesday at 10.00 on the patio*.
b. It was [on Tuesday at 10.00 on the patio] that I gave flowers to John.
- (20) a. [On Tuesday at 10.00 on the patio] would be acceptable.
b. Would [on Tuesday at 10.00 on the patio] be acceptable?

- (21) a. I gave flowers to John *on Tuesday at 10.00 near my house on the patio*.
 b. It was [on Tuesday at 10.00 near my house on the patio] that I gave flowers to John.
- (22) a. [On Tuesday at 10.00 near my house on the patio] would be acceptable.
 b. Would [on Tuesday at 10.00 near my house on the patio] be acceptable?

In a similar fashion too, temporal PPs can cluster alone, as can location ones. Non-PP temporal and location adjuncts can also cluster. Consider the following:

- (23) a. It was [yesterday on the patio] that I gave flowers to John.
 b. It was [on the patio yesterday] that I gave flowers to John.

Let us confirm that the result of the c-command data from (12) holds for these cases, namely that the complement of the first PP asymmetrically c-commands the complement of the second. NPI Licensing data for the PPs in (19)-(20) alone will be considered:

- (24) a. [On no day at any time on the patio] did I give flowers to John.
 b. *[On any day at no time on the patio] did I give flowers to John.
- (25) a. [On no day at 10.00 on any patio] did I give flowers to John.
 b. *[On any day at 10.00 on no patio] did I give flowers to John.

- (26) a. [On Tuesday at no time on any patio] did I give flowers to John.
 b. *[On Tuesday at any time on no patio] did I give flowers to John.

The clear conclusion we can derive from (24)-(26) is that the position of *Tuesday* in (19)-(20) asymmetrically c-commands those of *10.00* and *the patio*, and that the position of *10.00* asymmetrically c-commands that of *the patio*. Consider also some co-ordination data:

- (27) a. [On [[Tuesday at 10.00 on the patio] and [Wednesday at 11.00 in the garden]]] I gave flowers to John.
 b. [On Tuesday at [[10.00 on the patio] and [11.00 in the garden]]] I gave flowers to John.

Thus, (19)-(20) have a right-branching structure, a conclusion which extends to (21)-(22).

Let us also consider whether two location PPs have a right-branching structure. Consider the NPI Licensing and co-ordination data:

- (28) a. I gave flowers to John *in the garden by the fence*.
 b. [In no garden by any fence] did I give flowers to John.
 c. *[In any garden by no fence] did I give flowers to John.
- (29) a. [In [[the garden by the fence] and [the shops at the mall]]] did I give flowers to John.

- b. [By [[the fence in the garden²] and [the car at home]]] did I give flowers to John.

That location PP sequences have a right-branching structure is clear from these data.

We will also turn to two temporal PPs. The NPI Licensing and co-ordination data resulting from this is:

- (30) a. I gave flowers to John *on Tuesday at 10.00*.
b. [On no day at any time] did I give flowers to John.
c. *[On any day at no time] did I give flowers to John.
- (31) a. [On [[Tuesday at 10.00] and [Wednesday at 11.00]]] did I give flowers to John.
b. [At [[10.00 on Tuesday] and [11.00 on Wednesday]]] did I give flowers to John.

In all of these cases, the data suggest a right-branching structure.

Let us now consider whether location and temporal adjuncts can cluster with either manner or reason ones. Consider first a manner PP and a temporal one:

- (32) a. I gave flowers to John *at 10.00 in a reluctant manner*.
b. *It was [at 10.00 in a reluctant manner] that I gave flowers to John.
c. *[At 10.00 in a reluctant manner] is acceptable.

² The second PP can also be read as a modifier of *the garden*.

These two PPs may not cluster. We may also test non-PPs here:

- (33) a. *It was [at 10.00 reluctantly] that I gave flowers to John.
b. *It was [yesterday in a reluctant manner] that I gave flowers to John.
c. *It was [yesterday reluctantly] that I gave flowers to John.

Thus, none of these adjuncts may cluster.

Consider a location and a manner PP together next:

- (34) a. I gave flowers to John *on the patio in a reluctant manner*.
b. *It was [on the patio in a reluctant manner] that I gave flowers to John.
c. *[On the patio in a reluctant manner] is acceptable.

These cannot cluster either. Again, non-PP cases contrast in the same way:

- (35) a. *It was [on the patio reluctantly] that I gave flowers to John.
b. *It was [there in a reluctant manner] that I gave flowers to John.
c. *It was [there reluctantly] that I gave flowers to John.

Therefore, we may conclude that manner adjuncts may not cluster with either temporal or location adjuncts.

Now consider a reason and a temporal adjunct:

- (36) a. I gave flowers to John *at 10.00 because of his success*.
 b. *It was [at 10.00 because of his success] that I gave flowers to John.
 c. *[At 10.00 because of his success] is acceptable.

Once again, these cannot be combined. Let us test non-PPs as well:

- (37) *It was [yesterday because of his success] that I gave flowers to John.

The same result is obtained.

Then there is a location and a reason PP:

- (38) a. I gave flowers to John *on the patio because of his success*.
 b. *It was [on the patio because of his success] that I gave flowers to John.
 c. *[On the patio because of his success] is acceptable.

These cannot cluster. Non-PPs result in the same judgements:

- (39) *It was [there because of his success] that I gave flowers to John.

Consider a reason and manner PP:

- (40) a. I gave flowers to John *in a reluctant manner because of his success*.
 b. *It was [in a reluctant manner because of his success] that I gave flowers to John.

- c. *[In a reluctant manner because of his success] is acceptable.

These cannot be combined either. Nor the non-PP cases:

- (41) *It was [reluctantly because of his success] that I gave flowers to John.

We should finally test multiple instances of manner PPs:

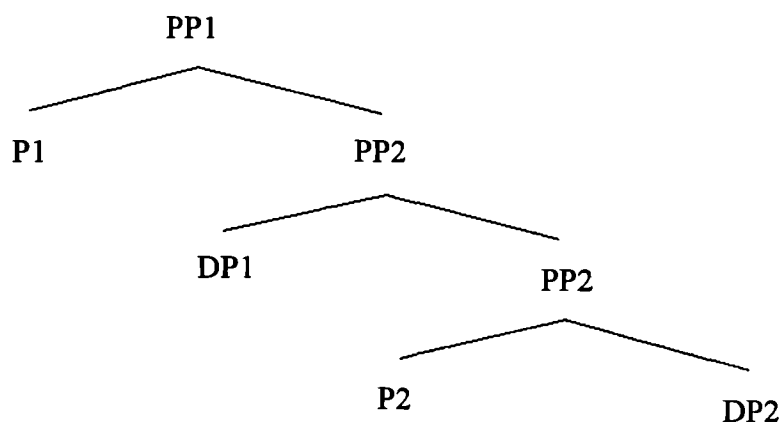
- (42) a. I gave flowers to John *in a reluctant manner at no great pace*.
b. *It was [in a reluctant manner at no great pace] that I gave flowers to John.
c. *[In a reluctant manner at no great pace] is acceptable.

The same result is obtained when we consider non-PP adjuncts:

- (43) a. *It was [slowly in a reluctant manner] that I gave flowers to John.
b. *It was [in a reluctant manner slowly] that I gave flowers to John.

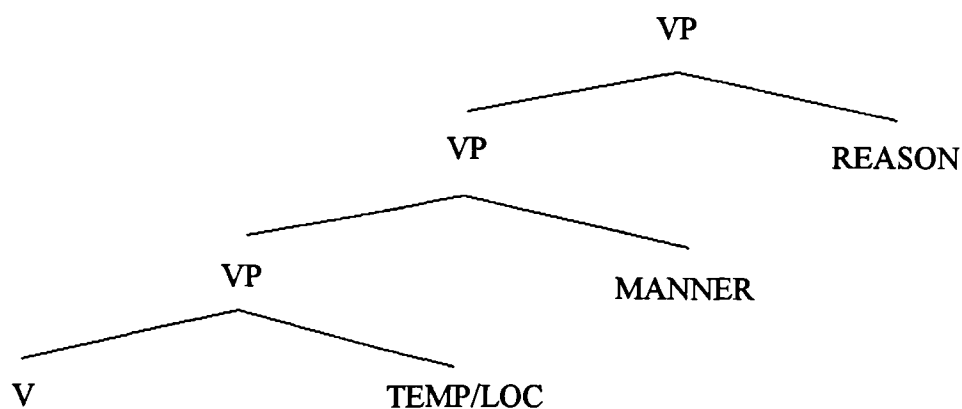
This data suggests that only temporal and location PP-adjuncts may cluster with the right-branching structure shown in (44) below:

(44)



Let us consider how to derive this constraint on clustering. Consider first of all the difference between the four types of adjunct, namely that only temporal and location adjuncts may cluster. We may derive this contrast from the proposal of Stroik (1996) we considered in Chapter 3, namely that only temporal and location adjuncts are base-generated within the VP shell, but manner and reason ones are VP-adjoined with reason adjuncts taking scope over manner ones. The VP in (45) illustrates this:

(45)



It should be clear from (45) that we should not expect manner or reason adjuncts to cluster with temporal and location ones, nor for them to cluster together if they are successively adjoined to VP. Of course, temporal and location adjuncts can cluster within the VP shell. Let us therefore adopt (45).

Consider now the contrast between clusters containing two adjuncts, which may be fronted, and those containing an argument and an adjunct, which cannot. The crucial examples from §4.0 are repeated below as (46):

- (46) a. *To John at 10.00 I gave flowers.
 b. At 10.00 in the garden did I give flowers to John.

Note that under a standard bottom-up derivation of syntactic structures, the contrast between (46a) and (46b) is still unexpected, since both arguments and adjuncts are within the VP shell in (45), and therefore they may still be constituents. Consider how these cases may be derived under Phillips' (1996) top-down approach, which we have adopted. After we have merged the clustered PPs with *I gave*, the structures in (47) result for (46):

- (47) a. [CP [PP1 To [PP2 [John] at [10.00]]] [IP I gave]].
 b. [CP [PP1 At [PP2 [10.00] in [the garden]]] did [IP I did [VP give]]].

Now the rest of the internal arguments of *gave* can be merged (I do not show the original base-generated position of the subject):

- (48) a. [CP [PP₁ To [PP₂ [John] at [10.00]]] [IP I gave [VP gave [flowers]]]].
 b. [CP [PP₁ At [PP₂ [10.00] in [the garden]]] did [IP I did [VP [flowers] gave [to John]]]].

The "moved" cluster is copied, and merged as the complement of *gave*, to leave (49) as the final structure:

- (49) a. *[CP [PP₁ To [PP₂ [John] at [10.00]]] [IP I gave [VP [flowers] gave [PP₁ to [PP₂ [John] at [10.00]]]]]].
 b. [CP [PP₁ at [PP₂ [10.00] in [the garden]]] did [IP I did [VP [flowers] gave [[to John] gave [PP₁ at [PP₂ [10.00] in [the garden]]]]]]].

The most important point about this latter step is that it completes the derivation, and so no further operation can be performed which may split the cluster. In (49a), therefore, *to John* being part of a PP cluster, is not a constituent after reconstruction of the PP cluster into VP. This has the consequence that the sequence *to John* cannot be assigned a θ -role by *gave*, so that (49a) cannot satisfy the θ -Criterion (or Principle of Full Interpretation). This situation is in marked contrast to what happens in an example like (50) below, in which *to John* is merged into the VP. Crucially there is a point in the derivation of (50) at which *to John* is both a constituent, and in a position in which it can be θ -marked:

- (50) I gave flowers to John at 10.00.

In (49b), reconstruction of the PP cluster only involves adjuncts, so that θ -marking is not an issue. In conclusion, both the ban on clustering of manner and reason adjuncts and that on the clustering of argument and adjunct PPs can be derived from independently motivated properties of the PPs involved: manner and reason adjuncts are not part of a right-branching VP structure, and arguments in a PP cluster fail to be θ -marked.

4.2 Path clusters

Having derived the fact that two adjuncts can cluster, but that an argument and an adjunct cannot, let us now consider the case of two PP Paths:

(51) John walked *across the road towards me*.

- (52) a. John looked *up the road at my house*.
 b. John looked *down the road at my house*.

The italicised PPs encode the Path where John walked and the direction where John looked. The Cleft sentences below suggest that these sequences cannot cluster, but have to behave independently of one another:

- (53) a. *It was [across the road towards me] that John walked.
 b. It was [across the road] that John walked [towards me].
 c. It was [towards me] that John walked [across the road].

- (54) a. *It was [up the road at my house] that John looked.
 b. It was [up the road] that John looked [at my house].
 c. It was [at my house] that John looked [up the road].
- (55) a. *It was [down the road at my house] that John looked.
 b. It was [down the road] that John looked [at my house].
 c. It was [at my house] that John looked [down the road].

Let us look at the PPs as subjects for confirmation of this conclusion:

- (56) a. *[Across the road towards me] would be acceptable.
 b. *Would [across the road towards me] be acceptable?
- (57) a. *[Up the road at my house] would be acceptable.
 b. *Would [up the road at my house] be acceptable?
- (58) a. *[Down the road at my house] would be acceptable.
 b. *Would [down the road at my house] be acceptable?

The strong conclusion we can draw from this data is that the sequences in (51)-(52) may not cluster.

I follow Hoekstra (1984) in treating *walk* as an unaccusative verb containing a small clause predicate, which itself contains the matrix subject *John*. The subject of

the small clause raises to the matrix Spec, IP for Case. The underlying structure for *John walked across the road* is shown in (59)³:

- (59) [VP V [VP [SC John [PP across the road]] walked]].

Let us adopt the same approach for *look* in (52) as well. The verb raises to the left of the small clause to achieve the surface word order. I assume that *towards me* and *at my house* function as adjuncts modifying *walked/looked*. If we try to reconstruct the clustered PP *across the road towards me* as the small clause predicate for (60a), the structure in (60b) results:

- (60) a. *Across the road towards me John walked.
 b. [CP [PP1 ACROSS [PP2 [the road] towards [me]]] [IP John walked
 [VP walked [VP [SC [PP1 across [PP2 [the road] towards [me]]]]
 walked]]]].

The PP small clause predicate *across the road* is not a constituent in its reconstructed position. We can assume that, in order for *John* to be properly licensed as its external argument, *the road* and *across* must be a constituent. Since it is not in (60b), we would not expect (60a) to be possible.

Now consider the following:

³ As well as the reading shown, there is another one, according to which John walked when he was across the road. I assume this has the same underlying structure in (59), but the subject *John* is licensed by *walk*, while the subject of the small clause predicate *across the road* is a PRO.

- (61) John walked *from home to school*.

Williams (1994) notes that this sequence may optionally behave as a cluster, contrary to our expectations. Consider the Cleft sentences:

- (62) a. It was [from home to school] that John walked.
b. It was [from home] that John walked [to school].
c. It was [to school] that John walked [from home].

That *from home to school* can cluster is confirmed by the fact that the sequence can act as a subject:

- (63) a. [From here to school] would be acceptable.
b. Would [from here to school] be acceptable?

Now let us check that the cluster has the shell structure we have proposed.

Consider the NPI Licensing data below:

- (64) a. From no school to any shop did John walk.
b. *From any school to no shop did John walk.

These suggest a right-branching structure. Principle C data may also be tested here:

- (65) *From her_i to Susan_i's home did John walk.

Again, the evidence points in the direction of a right-branching structure. Finally, there is some co-ordination data:

- (66) a. [From [[home to school] and [the library to the shops]]] did John walk.
 b. [To [[school from home] and [the shops from the library]]] did John walk.

The argument that *from home to school* has a right-branching shell structure is confirmed.

Let us consider why clustering is possible here. The derivation of an example where the cluster is fronted will be given first of all. For the example in (67a), the partial structure resulting from merging the cluster into the clause is given in (67b):

- (67) a. From home to school did John walk.
 b. [CP [PP₁ From [PP₂ [home] to [school]]] did [IP John did [VP walk]]].

Movement of the cluster is licensed under copying, as in:

- (68) [CP [PP₁ From [PP₂ [home] to [school]]] did [IP John did [VP walk
 [PP₁ *from* [PP₂ [*home*] to [*school*]]]]]].

Jackendoff (1990) and Williams (1994) argue that *from_to* denotes a compound or discontinuous head, encoding the path John walked. Let us suppose that such a head is merged as a PP shell, like the clusters we have been considering, but encoding a single concept of Path. Thus, it will not be relevant to the licensing of the external

argument that *from here* is not a constituent, since the entire copied cluster denotes a Path. Thus we can derive the fact that *from_to* may cluster. There is also the option of treating the PPs as separate constituents. Now let us consider a similar compound location head.

4.3 Locations

Recall that we saw in §4.1 that location PPs could cluster:

- (69) a. I gave flowers to John *near my house on the patio*.
b. Near my house on the patio did I give flowers to John.

One point about these examples was that clustering was not obligatory, and that the PPs could be syntactically independent of one another. Consider the following Cleft sentences for reference:

- (70) It was [near my house on the patio] that I gave flowers to John.
- (71) a. It was [near my house] that I gave flowers to John [on the patio].
b. It was [on the patio] that I gave flowers to John [near my house].

Now let us consider the following:

- (72) a. I saw John *across the road from me*.

- b. I saw John *up the road from me*.
- c. I saw John *down the road from me*.

The constituency of (72a-c) is exhibited by the Cleft sentences below:

- (73) a. It was [across the road from me] that I saw John.
- b. *It was [across the road] that I saw John [from me].
- c. *It was [from me] that I saw John [across the road].

- (74) a. It was [up the road from me] that I saw John.
- b. *It was [up the road] that I saw John [from me].
- c. *It was [from me] that I saw John [up the road].

- (75) a. It was [down the road from me] that I saw John.
- b. *It was [down the road] that I saw John [from me].
- c. *It was [from me] that I saw John [down the road].

As before, the clustering property of the location may be seen in the a cases.

However, a crucial difference is that they may not be split, as the b and c cases show.

Just to re-inforce the conclusion that they are clusters, consider the subject cases:

- (76) a. [Across the road from me] would be acceptable.
- b. Would [across the road from me] be acceptable?

- (77) a. [Up the road from me] would be acceptable.

- b. Would [up the road from me] be acceptable?

(78) a. [Down the road from me] would be acceptable.

- b. Would [down the road from me] be acceptable?

One distinction between these cases and *from home to school* is that *from me* here may not appear on its own. Compare the two sequences in (79) and (80):

(79) a. John walked from home.

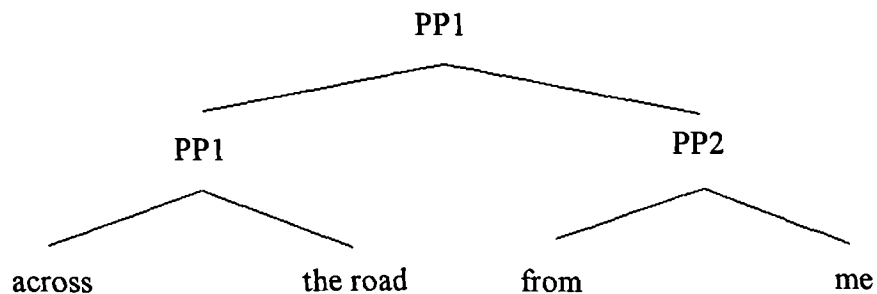
- b. John walked to school.

(80) a. I saw John across the road.

- b. *I saw John from me.

Hans van de Koot (p.c.) suggests on the basis of this that *from me* in (72) modifies the *across-/up-/down-*phrase. Let us investigate the following structure:

(81)



Unlike the PP shell above, *the road* does not c-command into *from me*, not could it and *from me* be co-ordinated. This is confirmed by the NPI Licensing data in (82)-(84) and co-ordination data in (85):

- (82) a. *I saw John across no road from any pub.
b. *I saw John across any road from no pub.
- (83) a. *I saw John up no road from any pub.
b. *I saw John up any road from no pub.
- (84) a. *I saw John down no road from any pub.
b. *I saw John down any road from no pub.
- (85) a. *I saw John [across [[the road from me] and [the park from his house]]].
b. *I saw John [up [[the road from me] and [the park from his house]]].
c. *I saw John [down [[the road from me] and [the park from his house]]].

As expected, *the road* does not c-command into PP2 in (81), nor can it and PP2 be coordinated. Thus, we may conclude that this cluster has a left-branching structure.

4.5 Conclusion

This final chapter of the thesis has provided further evidence in favour of Phillips' (1996) approach to VP structure, which argues for a left-to-right derivation of syntactic structures. We have demonstrated that such derivations allow us to explain

the fact that PP clusters consisting of an argument and an adjunct are ungrammatical, but that those containing two adjuncts are not: because the argument will not be a constituent, and therefore consequently receive its θ -role. We may also explain that a PP cluster secondary predicate may license an external argument when the cluster denotes a single Path concept. If they function separately the secondary predicate will not be a constituent, and so cannot assign θ -roles. These clusters have for the most part been seen to have a right-branching structure, but there are cases where left-branching is required, namely those PPs in (72).

CHAPTER 5

CONCLUDING REMARKS

In this thesis, we have examined from the perspective of English degree constructions Kayne's (1994) proposal that syntactic structures are universally right-branching. The argumentation of Chapters 2 and 3 took the form of a comparison between the evidence for, respectively, left-branching and right-branching in English VPs and degree constructions.

In Chapter 2, the result of applying syntactic constituency tests to VPs suggested that they were left-branching. Also, Chomsky (1980) argued that the fact that verbs and their indirect objects may encode idioms entailed that dative and double object constructions should have left-branching structures. However such a conclusion was seen to be problematic, and so we discounted it. With respect to degree constructions, evidence based on extraction and the scope taking properties of degree words suggested that result clauses and the satellites of comparatives are base-generated within the left-branching structure of the predicate when they take narrow-scope, remaining there throughout the derivation except when the degree word is a modifier. They are base-generated as right-adjoined to the matrix clause when they take wide-scope, and the degree word may raise to a position to select the result clause when it is a modifier. Syntactic constituency tests provided further evidence in favour of these left-branching structures for degree constructions, although Pseudo-cleft, Substitution and Predicate Ellipsis data did not. However, we explained the latter by

making some minimal assumptions about selection and the licensing of the satellite as an adjunct, and so they are no longer seen as evidence against left-branching.

Chapter 3 cited evidence based on c-command and co-ordination tests that VPs have a right-branching structure. The contradiction between this evidence and that for left-branching was noted as being of great concern to theorists. Approaches to this contradiction from Pesetsky (1995) and Phillips (1996) were presented. From a minimalist perspective, the latter proposal was deemed to be ideal under the spirit of the Minimalist Program, according to which only a single phrase marker should be generated for each string of lexical items: Pesetsky proposed that both a left-branching and a right-branching structure should be generated simultaneously. Scope data were derived under Phillips' theory by allowing left-branching structures to be generated in restricted circumstances.

We considered alternative right-branching treatments of degree word scope: namely one from Kayne (1994), one from Baltin (1987) which argued for simultaneously generating a right-branching and a left-branching structure (à la Pesetsky's 1995 proposal for VPs) and some co-ordination analyses. They were found to be problematic. The remainder of Chapter 3 centred on applying c-command and co-ordination tests to degree constructions. It was noted that the evidence for left-branching from Chapter 2 was just as problematic for a right-branching approach to degree constructions as it was for VPs. Thus, we tested to see whether a left-to-right derivation as proposed by Phillips (1996) for VPs could be extended to degree constructions, as the structure underlying the narrow-scope reading. One defining characteristic of Phillips' approach was that the complement of a preposition in a VP did not need to remain as its complement throughout the derivation, and could be restructured (as he terms it) as the specifier of a lower verb head in a shell. In support

of this, one found that c-command relations exist between this complement and lower material in the shell, and that they could be co-ordinated. Tests were performed on degree constructions in order to investigate whether this was a possible derivation: the environment tested was one where the PP complement of AP is split, with the complement of P forming a constituent with the satellite. The results of this set of tests was not clear, with some favouring, but most not favouring, a right-branching structure. I therefore considered some of the tests further, and argued that they were not actually indicative of a c-command relationship, but involved relations which were not licensed syntactically. The remaining tests unambiguously indicated that the Phillips-style derivation was incorrect. We then considered a less radically right-branching structure, where the PP complement as a whole was restructured. Co-ordination evidence for result clauses suggested that this structure was correct, but that for comparatives did not. A more classical Larsonian-type shell for comparatives was tested, finally, and co-ordination evidence supported such a structure.

My final proposal regarding the structure of degree constructions is that, for the wide-scope reading for result clauses and comparatives, the satellite is base-generated adjoined to the matrix clause. For the narrow-scope reading, the result clause has a shell structure where a PP complement of AP is restructured to form a constituent with the lower copy of the degree word and the satellite; while the comparative satellite is a constituent with AP. The fact that both left-branching and right-branching structures are necessary clearly indicates that Kayne's hypothesis that syntactic structures are universally right-branching is too strong, and that Phillips' approach to structure generation is to be preferred.

Further evidence in favour of Phillips' left-to-right derivations of English VPs was found in Chapter 4. Jackendoff (1973) noted that some sequences of two PPs

acted as a constituent. Evidence was provided first of all that this phenomenon was real, and the PPs (and other categories) could not have been base-generated in the fronted position, or moved there separately. Only temporal and location adjuncts could cluster as a constituent with a PP shell structure. The fact that temporal and location adjuncts could not cluster with other types of adjunct was derived as a result of the argument in Chapter 3 that the former are base-generated within the VP shell while the latter are adjoined to it. Therefore they cannot form a clustered constituent. The fact that argument and adjunct PPs could not cluster together was attributed to the argument not being a constituent, and therefore it could not be assigned its θ -role. It was predicted that secondary predicate PPs could not cluster with a further PP since the predicate PP would not be a constituent, and could not as a result assign θ -roles. Data was found to confirm this prediction, but it seemed not to hold in some cases. This was attributed to the fact that the two PPs denoted a single secondary predicate functioning as a Path. I argued that such a constituent also had a shell structure, which was confirmed by c-command data. We also saw that some location PPs could cluster, but that it did not have a shell structure. I argued that it has a structure where the linearly second PP is adjoined to the first. The fact that both right-branching and left-branching structures are available for clusters provides further support for Phillips' (1996) work on phrase structure.

Some questions that arise concerning Phillips' work are the following. Firstly, how may we square the circle of Phillips' global principle *Branch Right* with current Minimalist trends towards local economy, cf. Collins (1997), Yang (1997) and Johnson and Lappin (1999)? Since changes in interpretation affect LF structures, how much look ahead is required during computation to enforce this? It is an open question how we can reduce the computational explosion induced by global

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