

There are two distinct traditions in the literature regarding the proper analysis of predicate noun and adjective constructions such as (1).

(1) I consider John crazy/a fool.

One tradition, going back as far as Chomsky 1955 and developed in works by Bach (1979), Dowty (1978, 1982), Bowers (1983a), Jacobson (1983), and Larson (1988), holds that the NP *John* is the direct object of a complex predicate *consider crazy/a fool*. The other tradition, going back at least as far as Williams 1975 and pursued in works such as Chomsky 1981, Stowell 1981, and many others, holds that *John* and *crazy/a fool* constitute a D-Structure clause-like constituent, a "small clause" (SC). Neither theory is without problems. The complex predicate theory, for instance, cannot account straightforwardly for the surface position of the direct object between the parts of the complex predicate; the SC theory has had great difficulty in finding a plausible candidate for the node that dominates the SC constituent in D-Structure.¹

The question that is ultimately posed by the existence of these SC constructions is, as Williams (1983) points out, whether a uniform, structurally based theory of predication is possible. I shall try to show in this article that the extension of X-bar theory to functional categories makes possible a theory in which both main clause and SC predication can be given a uniform structural definition and, correspondingly, a uniform semantic interpretation. It will emerge from this discussion that the SC theory and the complex predicate theory are, in a certain sense that will be made precise, both correct. In the course of developing a general theory of predication, it will be necessary to discuss

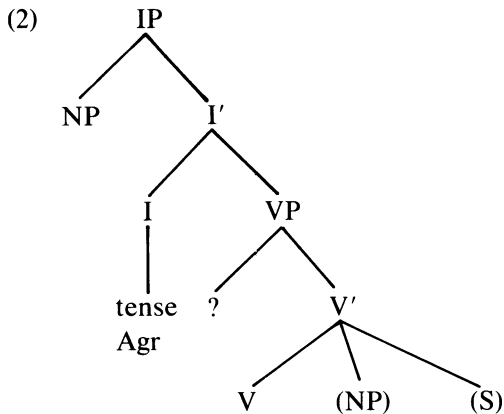
The earliest version of this article was circulated in manuscript form circa 1988. Since then the article has undergone a number of transformations and has been presented publicly in various forms, most notably at the conference "Perspectives on Phrase-Structure," held at Tucson, Arizona, on July 5–6, 1989. This latest version owes so much to so many colleagues and students that it would be hopeless to attempt to list them all. I must, however, single out for special gratitude my colleagues Gennaro Chierchia, Wayne Harbert, Jim Huang, and John Whitman, as well as all the students who have attended my seminar on functional categories for the past three years, but most especially John Bailyn, Laurent Dekydtspotter, Yang Gu, Ed Rubin, Jane Tang, Jacqueline Toribio, and Tomo Yoshida. I would also like to thank the two anonymous reviewers of *Linguistic Inquiry*. All errors are of course my own.

¹ I refer the reader to Williams 1983 for the most thorough discussion in the literature of the problems facing the SC theory. I know of no comparable summary of the pros and cons of the complex predicate theory. There is a third account of SC predication, namely, the coindexation theory advocated by Williams (1980). I shall not address Williams's theory of predication directly, because certain of the phenomena to be discussed in this article simply cannot be described without assuming an SC constituent (see footnotes 7, 17, and 20).

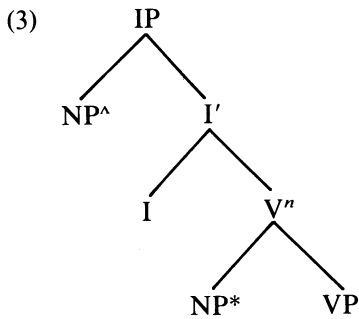
in some depth the so-called direct object relation. I show that the direct object relation is similar, both structurally and semantically, to the subject relation. I then present a wide range of empirical arguments that strongly support the proposed theory of predication. In the course of this discussion, I consider the position of dative arguments and clausal complements, showing that there is a fixed hierarchical relation between them. This in turn leads to a universal characterization of the structure of propositions that is quite restricted, both syntactically and semantically.

1 Subjects

It is a well-established fact that natural language exhibits a fundamental asymmetry between the subject of a sentence and other arguments of the verb such as the direct object, indirect object, and sentential complements. In classical Government-Binding Theory, this asymmetry is expressed in structural terms as shown in (2), by generating subjects in the Spec(ifier) position of the functional category I and other arguments in the VP constituent that is the complement of I.



The result is that the subject c-commands all the other arguments in the sentence. Assuming a uniform two-level version of X-bar theory, this raises the question, as Kuroda (1988) notes, of what occupies the [Spec, V] position. Kuroda's solution, which has come to be known as the *internal subject hypothesis*, is that the subject originates universally in [Spec, V] in D-Structure and is raised, in languages such as English, into [Spec, IP] in order to be assigned Case. Slightly different forms of the internal subject hypothesis have been proposed by (among others) Fukui (1986), Kitagawa (1986), and Koopman and Sportiche (1985, 1991). What they all have in common is that subjects originate within some projection of V. The structure proposed by Koopman and Sportiche, for example, is as shown in (3).



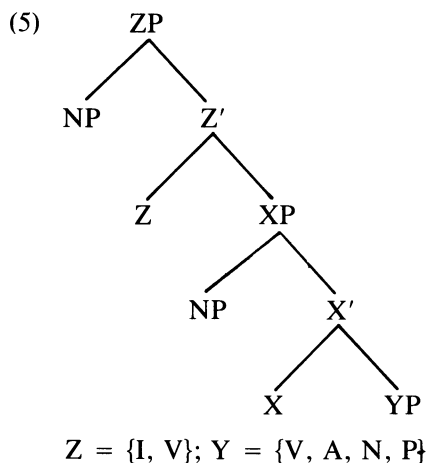
A potential disadvantage of this approach is that it apparently leads either to a nonuniform X-bar theory (if V^n is taken to be a projection of V^0) or to the reintroduction of an exocentric category similar to S (if V^n is taken to be, in effect, a new category unrelated to V). Fukui's theory also requires a nonuniform version of X-bar theory since functional categories project two bar levels whereas lexical categories project only a single (iterable) bar level. Moreover, this leads to the result that the canonical structure of propositions can differ radically from one language to the next, since some languages lack functional categories altogether, according to Fukui.

The main problem with all of these theories, however, is that they are unable to provide a unified structural account of both main clause and SC predication. Kuroda's theory, for example, might be extended to predicate adjective constructions by generating the subject in [Spec, A], but a similar approach to predicate nominal constructions runs into the insuperable difficulty that the predicate nominal can be a full DP:

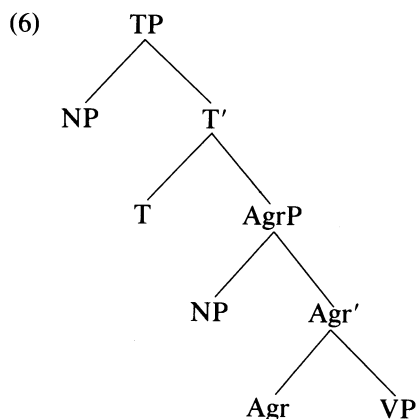
- (4) a. I consider John a fool.
 b. Mary considers me her friend.

An extension of Fukui's theory along the same lines runs into exactly the same problem, as does Koopman and Sportiche's approach. I think it is worth investigating whether it is possible to construct a theory that (a) incorporates the internal subject hypothesis; (b) makes possible a uniform structural definition of main clause and SC predication; and (c) maintains a strictly uniform two-level X-bar theory. I shall also assume, following Kayne (1984), that only binary branching is permitted, further narrowing the range of possible structures permitted in the syntax of natural languages.

One way of doing this would be to hypothesize a new functional category, which I shall simply call X for the moment, whose maximal projection could occur either between I and V, or as a complement to V, as in (5). Assume that the D-Structure position of subjects is [Spec, XP]. If $Z = I$ and $Y = V$, then we get main clause predication in English; if $Z = V$ and $Y = A, N$, or P , then we get SC predication in English. There are apparently languages such as Sinhala (see Sumangala 1992) in which it is possible for $Z = I$ and $Y = A, N$, or P .



Supposing that such an approach is correct, we must then find out what X is, that is, what its syntactic and semantic properties are. One initially attractive candidate for X is the category Agr, which Pollock (1989) has proposed as a category intermediate between V and I (the latter now renamed T for “tense”), as illustrated in (6).



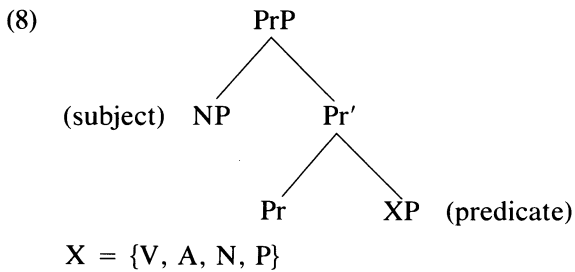
Could X be identified as Agr? I shall argue in section 3.2.1 that though the empirical evidence brought forward by Pollock does argue for the existence of a new category whose maximal projection is a complement of I and that takes VP as its complement, this category cannot be identified with Agr. Whether or not I should be split up into two separate categories T and Agr is, rather, a separate issue. (See section 3.2.1 for some evidence that it should be.) For the moment, it is sufficient to observe that if subject agreement is to be accounted for by positing AgrP, then object agreement must also be accounted for by assuming a second occurrence of AgrP (as proposed in Chomsky 1991b, 1992). This second Agr, call it AgrO, obviously must occur between T and V. Further-

more, in languages as diverse as Latin and Swahili, subject agreement morphology occurs farther away from the stem than the tense morphemes, suggesting that the canonical position for AgrS is *above* T (Chomsky 1991b, 1992):

$$(7) \text{ [AgrSP . . . AgrS}^0 \text{ [TP . . . T}^0 \text{ [AgrOP . . . AgrO}^0 \text{ [VP . . .]]]}]$$

If the work cited earlier, suggesting that subjects originate from some position below I (or T), is correct, then obviously the D-Structure subject position cannot be [Spec, AgrS], nor does it make any sense to identify it as [Spec, AgrO]. Hence, the required intermediate category X, assuming it exists, cannot be identified with Agr.

Since none of the presently existing category names seems appropriate, I shall introduce a new category name *Pr*, a mnemonic for *predication*, reflecting its semantic function. I assume that Pr is a functional category that has the following basic properties: (a) the canonical D-Structure position for external arguments is [Spec, Pr];² (b) Pr⁰ F-selects the maximal projection YP of any lexical category Y; (c) either PrP is F-selected by I⁰, or it can be subcategorized as a complement by V; (d) the semantic function of Pr is predication. As is immediately evident, predication is uniformly represented as in (8).



Examples of SC and main clause predication are the following:

- (9) a. [IP they consider [PrP John [Pr' [Pr e] [AP crazy]]]]
 b. [IP e [I' will [PrP John [Pr' e [VP laugh]]]]]

With regard to Case theory, I assume that structural Cases such as nominative and accusative are assigned or (following Chomsky (1992)) checked through Spec-head agreement, whereas inherent Cases such as dative are assigned to complements. Case as-

² I assume, following Chomsky (1981), Rothstein (1983), and Chierchia (1989), that the half of the Extended Projection Principle (EPP) that requires that clauses have subjects can be derived from the general principle that functions must be saturated. If Pr' is uniformly translated in logical form as an unsaturated function (see the Appendix for details), it follows that clauses must have subjects. As many researchers have noted, whether or not the EPP can be maintained depends crucially on the status of small clauses. The category Pr, in turn, provides a principled structural basis for the syntactic small clause unit required by the EPP, thereby avoiding ad hoc notations such as SC, or, alternatively (as in Chung and McCloskey 1987), the theoretically unacceptable assumption that there is just one maximal nonprojection (S). The arguments in this article thus provide extremely strong support for the EPP and for the more general principle underlying it that functions must be saturated.

signment is thus local in the sense that it always takes place within the maximal projection of the relevant X^0 category. In languages such as English assignment of nominative Case by the Agr element of I (or possibly a higher functional category Agr, but in any case not Pr) must take place before PF, presumably because nominative Case is “strong” in English (Chomsky 1992). Hence, movement of the primary subject from [Spec, PrP] to [Spec, I] will be overt in English. If, on the other hand, checking of nominative Case is delayed until LF in some language with “weak” Case features, then the result will be VSO surface constituent order.³ If PrP is embedded as a complement to D^0 , the primary subject will again have to move before PF in English in order to be assigned Case, but in this instance it will move to [Spec, D], where it will be assigned genitive Case. The result, as argued by Abney (1987), Bowers (1987, 1991), and others, is a gerundive nominal. Anticipating later discussion, it will be assumed that accusative Case is assigned through Spec-head agreement in [Spec, V] and dative Case to NPs in complement position. Finally, it has been shown by Bailyn and Rubin (1990) that in Russian instrumental Case is uniformly assigned by Pr⁰.

The proposed theory has a number of advantages. First, it provides a uniform structural definition of the notion “external argument” and of the predication relation, both for SCs and for main clauses. The external argument, by definition, is the argument in [Spec, Pr]. The predication relation holds, by definition, between the argument in [Spec, Pr] and the complement of Pr. Second, it solves the problem of finding an appropriate dominating node for SC constructions within the framework of X-bar theory: an SC is simply PrP, the maximal projection of Pr. Third, it makes it possible to maintain a uniform two-level version of X-bar theory. Fourth, it solves a minor, but significant, mystery of English syntax, namely, the status of the element *as* in SC complements of verbs such as *regard*, for example, *I regard John as crazy/an idiot*. Such clauses are completely parallel to the SC complements of verbs such as *consider*, for example, *I consider John crazy/an idiot*. The only possible lexical category that *as* could be assigned to is P, but that is ruled out because prepositions do not generally take AP complements. If, how-

³ See Koopman and Sportiche 1985, 1991, for arguments that the raising of subjects to [Spec, IP] is parameterized in this fashion. Also, Modern Irish, as described by Chung and McCloskey (1987), is such a language. As Chung and McCloskey’s example (52) illustrates, the unmarked word order in main clauses in Modern Irish is V-S-O-Comp:

- (i) Thug mé cúig phunt do Chiarán i nDoire inniu.
 give(PAST) I five pound to Ciaran in Derry today
 ‘I gave five pounds to Ciaran in Derry today.’

They argue, following Sproat (1985), that the underlying order in Modern Irish is SVO; that I⁰ governs and assigns Case to the subject of the SC to its right that it selects; and that the surface VSO order results from movement of the verb to I⁰ for inflection. Replacing their category S with PrP leaves their analysis completely intact while avoiding their conclusions that “the structure we have proposed for S in Irish is incompatible with the basic claims of X-bar theory” and that “it is thus necessary for the theory of grammar to allow at least some (language-particular) phrase structure configurations that conform to no principled cross-categorical pattern” (p. 235). The theory proposed here thus provides a principled solution to the seemingly paradoxical fact that in one language (English, for example) S is a projection of I, whereas in another (namely, Irish) it is not. Instead, both languages project both the categories I and Pr uniformly.

ever, *as* is regarded as a direct lexical realization of Pr, then its peculiar properties follow immediately.⁴ Fifth, if the semantic function of Pr at the level of logical form is predication, then the relation between the syntax and the semantics of predication becomes transparent. (See the Appendix for an explicit compositional semantics of predication, based on Chierchia 1985, 1989 and Chierchia and Turner 1988.) As a historical footnote, it is worth noting that the following base rules in Chomsky 1965 incorporate intuitions very similar to those that underlie the theory proposed here:

(10) $S \rightarrow NP$ Predicate-Phrase

$$\begin{aligned} \text{Predicate-Phrase} &\rightarrow \left\{ \begin{array}{l} \text{Aux VP (Place) (Time)} \\ \text{Copula Predicate} \end{array} \right\} \\ \text{VP} &\rightarrow \left\{ \begin{array}{l} (\text{NP}) (\text{Prep-Phrase}) (\text{Prep-Phrase}) (\text{Manner}) \\ \text{V S}' \\ \text{Predicate} \end{array} \right\} \\ \text{Predicate} &\rightarrow \left\{ \begin{array}{l} \text{Adjective} \\ (\text{like}) \text{Predicate-Nominal} \end{array} \right\} \end{aligned}$$

The theory outlined above provides a principled account of the idea, implicit in the rules of (10), that both ordinary VPs and predicate nominal constructions are realizations of an underlying predication relation that projects a phrasal node (the category Predicate-Phrase) in the same way that lexical categories do.

2 Objects

The formation of phrases of the category PrP involves what will be termed *primary predication*, that is, the combination of an external argument with a Pr' expression to form a PrP. Expressions of the category VP can also contain one or more arguments. The first of these is traditionally referred to as the *direct object*; other arguments are usually referred to as *complements*. There is a persistent tradition in the literature that a certain parallelism exists between subjects and objects. Thus, Jespersen (1965) states, 'Both subject and object are primary members, and we may to some extent accept Madvig's dictum that the object is as it were a hidden subject, or Schuchardt's that 'jedes objekt ist ein in den schatten gerücktes subjekt'. . . In many ways we see that there is

⁴ Wayne Harbert (personal communication) points out that the Welsh particle *yn*, which appears in predicate AP and NP constructions and in progressive VP constructions (Zaring 1989:n. 5), may well be a direct lexical realization of the category Pr:

- (i) a. Mae Rhys yn athro.
is Rhys PTC teacher
'Rhys is a teacher.'
b. Mae Gwyn yn edrych ar y teledu.
is Gwyn PTC look on the TV
'Gwyn is watching TV.'

Replacing S with PrP in Chung and McCloskey's (1987) analysis (see fn. 3) yields the following structure for (ia):

- (ii) [_{IP} mae [_{PrP} [_{NP} Rhys] [_{Pr'} [_{Pr} yn] [_{NP} athro]]]]

some kinship between subject and object” (p. 60). As evidence for his claim, Jespersen cites “the frequency of shiftings from one to the other in course of time,” as well as the fact “that there are here and there sentences without a formal subject but with an object, as *G. mich friert, mich hungert*” (p. 60). Modern research has revealed the existence of quite a few formal syntactic similarities between subjects and objects, some of which I list here:

- (11) a. The subject *c*-commands everything else in the clause; the object *c*-commands everything but the subject (Barss and Lasnik 1986).
- b. Both subject and object are assigned structural Case (Chomsky 1981).
- c. Both subject and object can agree with the verb (see sections 3.2.1 and 3.2.2).
- d. Both subject and object control PRO subject of infinitive and SC complements.
- e. Both subject and object are possible $\bar{\theta}$ -positions (Postal and Pullum 1988).

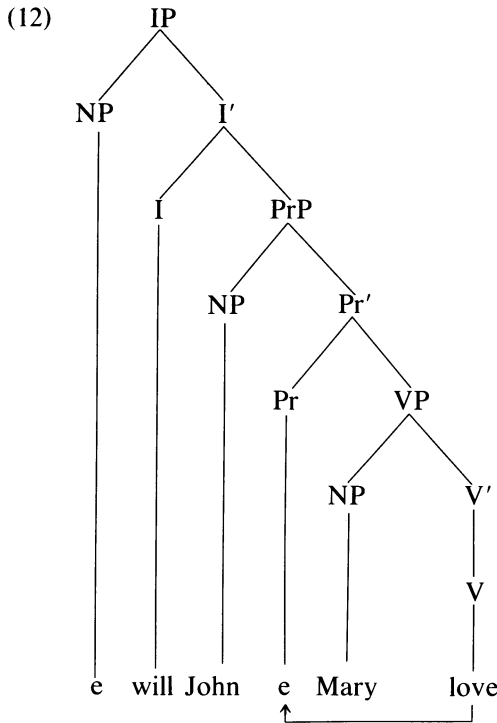
To account for this parallelism, I shall assume, following a line of thought that goes back to at least Dowty 1982, Jacobson 1983, and Bowers 1983, and is further developed in works such as Jacobson 1987, Bowers 1987, 1989, and Larson 1988, that direct objects are generated in [Spec, V], parallel to the position of subjects in [Spec, Pr]. This accounts immediately for (11a). The remaining properties in (11) will be discussed in due course. To emphasize the parallelism between subjects and objects, I shall sometimes refer to the latter as *secondary subjects*.

Although there are structural similarities between subjects and objects, it should be noted that PrP and VP differ in fundamental ways as well. A PrP is what Chomsky (1986) has termed a *complete functional complex* (CFC), meaning that it can stand on its own as a complete “thought” or “information unit,” as it is termed by Chierchia and Turner (1988). A transitive VP, in contrast, is not a CFC in this sense, but rather is a property. In most theories of formal semantics, this difference is accounted for by assigning propositions and properties to different logical types. A further difference, in Fregean theories at least, is that only propositions are assigned truth values as their referents. One reason why it is desirable to assume that the phrasal units that contain the subject and object, respectively, are projections of different categories, Pr and V, rather than assuming that they are projections of the same category, is that these semantic properties can be associated directly with the relevant syntactic category.⁵

⁵ In Larson 1988, for example, the phrasal categories containing subject and object are both VP. Hence, it will have to be stipulated somehow that the “higher” VP is assigned to the type of propositions, whereas the “lower” VP is assigned to the type of properties. In my theory, in contrast, the type assigned to PrP and VP, respectively, will be fixed automatically by universal principles. For an explicit formal semantics along these lines, together with universal principles governing the mapping relation between syntax and semantics, see the Appendix.

Chomsky (1991a) has proposed an interesting method of deriving Larson’s “VP-shells” from general principles. According to this view, the outer VP-shell is only projected if the argument structure of the verb requires it. The category PrP, in contrast, must always be projected. In as yet unpublished work, I have proposed arguments against the former view and in support of the latter.

Supposing that these notions are correct, the syntactic structure of a transitive sentence such as *John will love Mary* will then be represented as in (12).



In order to obtain the right surface order, the verb must be moved obligatorily by head-to-head movement into the Pr position, as indicated. This result can be derived from general principles if it is assumed that (a) verbs assign (or check) θ -roles, and (b) θ -role assignment (or checking) is local.⁶ Before proceeding, let us examine these assumptions in more detail. I assume, first of all, that θ -roles are assigned locally to NPs in Spec positions through Spec-head agreement and to complement NPs, where “assigned locally” means assigned within the maximal projection of the X^0 category containing the verb. The structural conditions under which θ -roles are assigned are thus identical to those under which Case is assigned. Second, I assume that θ -roles are assigned com-

⁶ Larson (1988) made a similar proposal around the same time that an earlier draft of this article was being circulated (Bowers 1988), based on his analysis of dative constructions. In Larson’s theory the verb raises to the head position in a higher VP. For some criticisms of this and other aspects of Larson’s proposals, see section 4 and footnotes 7 and 25.

Jackendoff (1990), reacting to Larson 1988, objects to V-raising on the grounds that it requires abandoning the level of D-Structure. Larson (1990) notes that this is only true if θ -role assignment is assumed to be local, as I in fact assume here. This is not a defect of my theory, however, since there are independent reasons for eliminating the level of D-Structure, as argued in Bowers 1973, 1981, Bowers and Reichenbach 1979, and Chomsky 1992.

positionally, going from the innermost to the outermost θ -role as P-markers are built up (see Bowers 1973, Bowers and Reichenbach 1979, Chomsky 1992; see also Fukui 1986 and Grimshaw 1990, for similar proposals). Given these assumptions, θ -role assignment will correlate with the syntactic structure in (9) in the following fashion: the innermost θ -role is assigned within V' to the complement; the next innermost θ -role is assigned within VP to the secondary subject; and the outermost θ -role is assigned within PrP, after V-raising has taken place, to the primary subject. The θ -role structure associated with verbs is represented in the following manner:

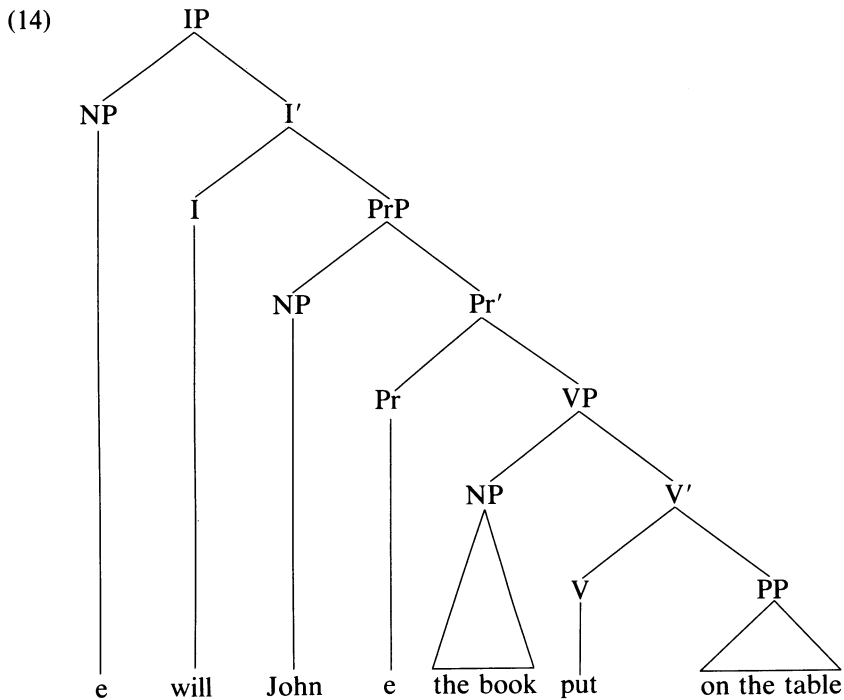
$$(13) \quad [[[\text{---} \theta_3] \theta_2] \theta_1]$$

The categories $\theta_n, \dots, \theta_1$ represent θ -roles, going from innermost to outermost, and the positions inside the brackets are, in effect, argument positions. If no θ -role is to be assigned at a given level, then the relevant argument position in (13) is simply left blank. The argument structure of an unaccusative verb with one argument would, for example, be represented as follows: $[[[\text{---}] \theta_2]]$. The argument structure of an unergative, on the other hand, would be represented as $[[[\text{---}]] \theta_1]$. If a θ -role is optionally assigned at a given level, then the relevant θ -role is placed in parentheses. So, for example, the argument structure of a verb such as *roll* that is either unaccusative or transitive would be $[[[\text{---}] \theta_2] (\theta_1)]$. If a verb does not assign a θ -role to the NP in the secondary or primary subject position, that does not mean that there cannot be a constituent in that position in the syntax. Rather, it simply means that a constituent in that position will not be assigned a θ -role by the relevant verb. Following Pesetsky (1982), Chomsky (1986) suggests that c-selection can be eliminated from the lexicon, leaving only s-selection. It seems unlikely, however, that a specification of argument structure can be eliminated entirely, particularly if the unaccusative hypothesis is correct. Argument structure thus represents the residue of subcategorization that is left after the elimination of reference to specific categories and their order in the base.

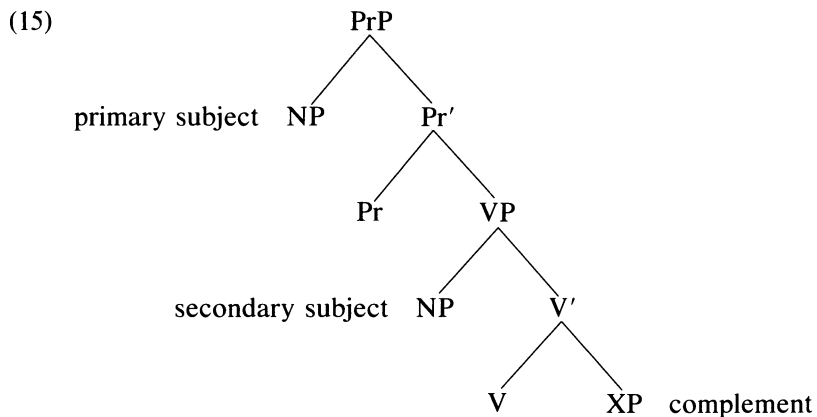
If θ -roles are assigned locally, then the obligatory movement of verbs into Pr⁰ follows at once, since otherwise it would be impossible for a θ -role to be assigned to the primary subject. Note that under this conception of θ -role assignment, θ -roles are assigned locally (i.e., within a maximal projection), independent of what happens within any other maximal projection. In other words, when the θ -role assignment mechanism is operating within one local domain, it cannot "see" what is going to happen at the next higher local domain. It follows that even a verb that assigns no θ -role at all to its primary subject (e.g., an unaccusative verb or a verb with an expletive subject) must nevertheless undergo V-raising in order to complete the process of θ -role assignment. Hence, raising of the verb to Pr⁰ is, in effect, obligatory, though this need not be stipulated, since it follows from the principles governing θ -role assignment.

Consider next a sentence containing a three-place predicate, such as *John will put the book on the table*. If the direct object *the book* originates in [Spec, VP], then *on the*

table can only originate as a complement of V in V'. Such an example would therefore have the structure in (14).



We may tentatively conclude, then, that clauses universally (order aside) have a uniform D-Structure representation of the form shown in (15).



An interesting consequence of the view that objects are secondary subjects is that all A-movement operations can be restricted to Spec-to-Spec movement. It can thus be

claimed that A-movement is structure-preserving in the extremely strong sense that not only are categories only permitted to move to positions where categories of the same type are permitted, but in addition categories can only move between functional positions of the same kind. Later on I shall make crucial use of this constraint on movement to explain why certain verbs lack passive forms (see section 3.5).

3 Empirical Arguments

I shall now discuss a variety of empirical arguments in support of the view that clauses are universally structured (linear order aside) as shown in (15). In principle, it would be possible to justify the different assumptions embodied in (15) separately. We could, for example, attempt to separate arguments in support of positing a functional category Pr from arguments in support of the claim that direct objects originate in [Spec, V]. However, it will become apparent as we proceed that the empirical evidence frequently supports the whole set of assumptions embodied in (15) jointly, making it difficult to justify each part separately. In instances where a piece of data appears to support one assumption independently of the others, I shall take note of that fact.

3.1 Conjoined Structures

A powerful empirical argument in support of the theory of clause structure proposed in this article is the fact that phrases each consisting of an object and its complement can, quite generally, be conjoined:

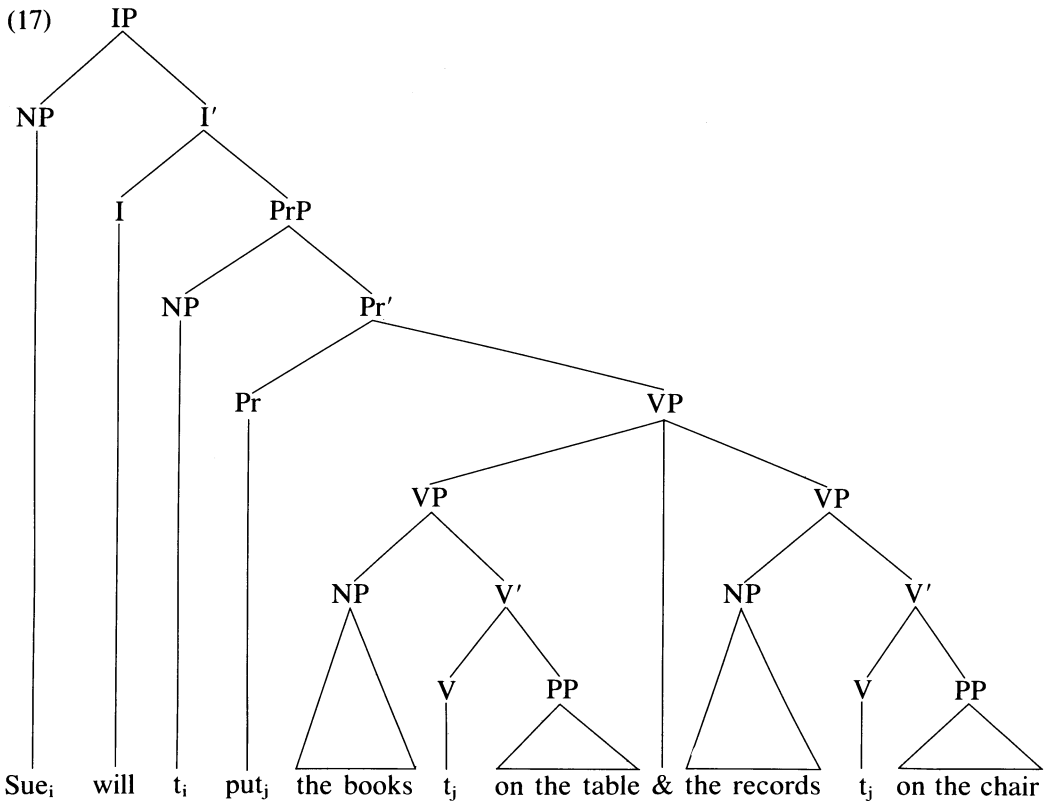
- (16) a. Mary considers John a fool and Bill a wimp.
- b. John regards professors as strange and politicians as creepy.
- c. Sue will put the books on the table and the records on the chair.
- d. Harriet gave a mug to John and a scarf to Vivien.
- e. I expect John to win and Harry to lose.
- f. We persuaded Mary to leave and Sue to stay.
- g. You eat the fish raw and the beef cooked.
- h. I convinced John that it was late and Bill that it was early.
- i. They told Sue who to talk to and Virginia when to leave.

Clearly, such structures are impossible to generate under the standard analysis of the VP.⁷ In the theory proposed here, on the other hand, they are easily analyzable as instances of across-the-board extraction of V from a conjoined VP, as in (17).

⁷ Obviously, this is also true of a theory of predication such as that of Williams (1980), in which predication is represented by adding indices to an otherwise standard representation of the VP.

Larson (1988) notes the possibility of forming such conjunctions in the case of dative structures like (16d). However, he fails to observe that they are possible in the full range of object+complement constructions. There are other problems with Larson's analysis of dative constructions, two of which I will mention here. First, he suggests that in order to account for examples such as (i),

- (i) I wrote a letter to Mary in the morning and a note to Max during the afternoon.



They are thus precisely parallel in structure to examples such as the following, involving ATB extraction of an auxiliary element from a conjoined IP:

- (18) a. Will John order fish and Mary choose steak, as usual?
- b. Did John read the book and Mary listen to the record, or vice versa?
- c. Is Mary eating steak and John gorging on veggies, as usual?

The existence of these conjoined VP structures thus provides strong evidence for the existence of a functional category Pr intermediate between I and V. We know on the

a structure containing three VPs must be assumed, the innermost of which contains the time adverbial as its complement. Besides rendering his theory incoherent, since *to Mary* is now analyzed as a complement in examples without the time adverbial, but as a subject in examples with the time adverbial, this is an inherently implausible structure for time adverbials. Fortunately, there is an alternative, namely, to treat time adverbials as VP adjuncts. Taken in conjunction with the analysis of manner adverbs proposed in section 3.2, this correctly predicts the possibility of examples such as the following:

- (ii) John learned French perfectly this year and Latin poorly the year before.

Second, the conjunction test can be used to falsify Larson's account of heavy NP shift in terms of V'-reanalysis (Bowers 1988):

- (iii) John considers odd anyone who hasn't read Barbara Pym and strange anyone who doesn't like James Thurber.
- (iv) I put in the closet all the larger volumes and on the table most of the smaller ones.

basis of comparative evidence that nonauxiliary verbs do not raise into I in English (Emonds 1978, Pollock 1989). Hence, ATB extraction is possible in these structures only if there is an X^0 position between I and V in which the extracted verb can be located. The needed head position is, I suggest, Pr.

It might be argued (see Gazdar et al. 1982, Jackendoff 1990) that the sentences in (16) are produced by the application of gapping in conjoined Pr' constituents,

- (19) [_{PrP} Mary [_{Pr'} considers [_{VP} John t a fool]] and [_{Pr'} \emptyset [_{VP} Bill t a wimp]]]

where \emptyset represents the position of the gapped verb. However, this seems unlikely to be correct, in view of the fact that gapping is quite generally bad when the gapped constituent contains more than two constituents:

- (20) a. *Mary put the books on the table and Sue \emptyset the records on the chair.
 b. *John persuaded Mary to leave and Bill \emptyset Sue to stay.
 c. *Mary considers John a fool and Sue \emptyset Bill a wimp.
 d. *Sue read the book yesterday and Harry the article today.
 e. *Harry bought a book at 6:00 in Harvard Square, and Fred at 9:15 in Brooklyn.
 f. *On Thursday Harry bought a book from Bill, and on Friday Fred from Ralph.

In contrast, instances of VP-coordination are not subject to such a restriction:⁸

- (21) a. I wrote a letter to Mary in the morning and a note to Max during the afternoon.
 b. I wrote nothing to Mary in the morning and hardly anything to Max in the afternoon.
 c. John gave the books to Mary at Christmas and the records to Sue on New Year's Eve.
 d. Sue learned Latin in school this year and French from her mother the year before.

Finally, note that the existence of RNR sentences containing VPs of the form in question (Larson 1990) provides independent support for the claim that objects and their complements, together with a V-trace, are constituents:

- (22) a. Smith loaned, and his wife later donated, a valuable collection of manuscripts to the library.
 b. Sue moved, and Mary also transferred, her business to a different location.

⁸ Jackendoff (1990) suggests that examples such as (21b) are as bad as those in (20) and that (21a) only has an interpretation in which *a letter to Mary* and *a note to Max* are construed as NP constituents. If correct, these judgments would undermine Larson's (1988) version of VP-coordination; however, I agree with Larson in rejecting them. See also the discussion in footnote 7.

- c. I succeeded in convincing, even though Mary had failed to persuade, Mary not to leave.
- d. We didn't particularly like, but nevertheless ate, the fish raw.
- e. Most people probably consider, even though the courts didn't actually find, Klaus von Bulow guilty of murder.
- f. Flo desperately wants, even though she doesn't really expect, the Miami Dolphins to be in the Super Bowl.

Another familiar observation concerning conjunction is that predicative expressions can be conjoined, even if they belong to different lexical categories:⁹

- (23) a. I consider John crazy and a fool.
- b. Bill is unhappy and in trouble.

In the theory proposed here, such sentences are analyzable as conjoined PrP complements:

- (24) [_{PrP} I [_{Pr} consider_i [_{VP} John_j t_i [_{PrP}[_{PrP} t_j e crazy] and [_{PrP} t_j e a fool]]]]]]

In any theory that treats SCs as projections of lexical categories (e.g., Stowell 1981), on the other hand, such examples will incorrectly be ruled out, since they will violate the general principle that only phrases of like category can be conjoined. Notice, incidentally, that the following contrast provides evidence for the claim that *as* is a realization of Pr⁰:

- (25) a. They regard John as crazy and as a fool.
- b. *They regard John as crazy and a fool.

(25b) is ruled out as a violation of the prohibition on conjoining constituents of unlike category, whereas (25a) is exactly parallel to (24), except that the Pr⁰ position contains *as*, instead of being empty.

3.2 Adverb Positions

Another way of demonstrating the need for the category Pr is the following. Assume, following Travis (1988), that adverbs are licensed by heads. If it can be shown that there is an adverb type in the appropriate position for which none of the presently accepted categories can function as the licensing head, and if it can be shown that Pr is a plausible licenser for adverbs of this type, then it is justifiable to conclude that Pr exists. Travis permits adverbs of different types to be licensed by different features associated with a

⁹ Zaring (1989) points out that predicate NPs cannot conjoin with objects of equative *be*:

- (i) a. *That man is Duncan and a fool.
- b. *That woman is famous and Bella Abzug.

This strongly suggests that equative sentences are quite different in structure from sentences with predicate NPs. I argue in Bowers 1991 that they are in fact simply ordinary transitive sentences.

single head; I shall adopt the more restrictive assumption that each adverb class is licensed by one and only one head.¹⁰ I also assume that manner adverbs are X' adjuncts. Bearing these considerations in mind, consider the following facts. First, note that certain manner adverbs in English can occur only in postverbal position,

- (26) a. John learned French perfectly.
 b. *John perfectly learned French.
 (27) a. Bill recited his lines poorly.
 b. *Bill poorly recited his lines.
 (28) a. Mary played the violin beautifully.
 b. *Mary beautifully played the violin.

whereas other manner adverbs can occur in both positions:

- (29) a. John learned French quickly.
 b. John quickly learned French.
 (30) a. Bill recited his lines slowly.
 b. Bill slowly recited his lines.
 (31) a. Mary played the violin confidently.
 b. Mary confidently played the violin.

These two types of manner adverbs can cooccur with one another, with the second type in either preverbal or postverbal position,¹¹

¹⁰ I discuss shortly an empirical argument against Travis's assumption. I also assume, contrary to Travis, that Adverbs project the phrasal categories Adv' and AdvP. That this must be so is shown by the fact that adverbs can themselves be modified by adverbs (Bowers 1975) and can also take complements (Jackendoff 1977).

This discussion of adverbs in English was directly influenced by the work of Chih-Chen Jane Tang on adverb placement in Chinese. See Tang 1990, especially chapter II, for detailed arguments from Chinese in support of the idea that adverb classes are licensed by heads and that there is a class of Pr-licensed adverbs.

As far as the semantics of adverbs is concerned, I shall adopt the standard view that they are modifiers, hence of type $\langle\beta,\beta\rangle$, where β is the type of the X' category that the adverb is adjoined to. Note, however, that if Adv projects a phrasal category, as was just asserted, then there must be some device for shifting the type of the AdvP to the type of modifiers. In unpublished work I have been exploring the possibility that there is a functional category *Mod*, which takes various X^{\max} categories as its complement and whose type is of the form $\langle\alpha, \langle\beta,\beta\rangle\rangle$, where α is the type of X^{\max} and β is the type of the X' category to which the ModP is adjoined. In languages such as Chinese, the category *Mod* is actually realized in the form of a special morpheme *-de*. See also Rubin 1991 for evidence from Romanian for a functional category *Mod*.

¹¹ It has been pointed out to me by a number of people, including one of the anonymous readers for *LI*, that examples such as the following are possible:

- (i) John learned French neither quickly nor perfectly.

This does not show that the proposed classification of adverbs is wrong. Rather, it shows that some adverbs such as *quickly* can be licensed either by V or by Pr. In fact, a sentence such as *John learned French quickly* is subtly ambiguous. If *quickly* is taken as a Pr-licensed adverb, it has the same interpretation as *John quickly learned French* and it means roughly that the whole process of learning French took a short length of time. If *quickly* is taken as a V-licensed manner adverb, it refers to the rate at which John's learning progressed. In (i) *quickly* has only the latter interpretation, as the theory predicts. Similarly, consider an adverb such as *stupidly*. As a Pr-licensed adverb in preverbal position, it is subject-oriented; (ii) means roughly 'It was stupid of John to learn French'.

- (ii) John stupidly learned French.

- (32) a. John quickly learned French perfectly.
 b. John learned French perfectly (very) quickly.

but in neither case can the positions of the two types of adverbs be interchanged:¹²

- (33) a. *John perfectly learned French quickly.
 b. *John learned French quickly perfectly.

The fact that these two adverb types can cooccur and cannot be interchanged strongly suggests that they are licensed by different categories. In the current theory, there are three possible licensing categories: V, I, and C. Obviously, we must assume that the first adverb type, the one with the more restricted distribution, is licensed by V. This leaves two possible licensers for the second type: I and C. The problem is that there are at least two additional types of adverb in English, both of which can cooccur with both of the types under discussion and neither of which can exchange positions with either of the others:

- (34) a. Clearly, John probably will quickly learn French perfectly.
 b. *Clearly, John quickly will probably learn French perfectly.
 c. *Quickly, John probably will clearly learn French perfectly.
 d. *Clearly, John perfectly will quickly learn French probably.
 e. *Perfectly, John probably will quickly learn French clearly.
 f. *Quickly, John perfectly will probably learn French clearly.
 g. *Quickly, John perfectly will clearly learn French probably.
 h. *Perfectly, John quickly will clearly learn French probably.
 i. *Perfectly, John quickly will probably learn French clearly.

It is apparent that there is (at least) one more adverb type than there are licensers. Under the current theory, there is only one possible solution to this problem, namely, to suppose that the two manner adverbs in question are both licensed by V, but are generated in different positions. (This is in fact the view adopted by Travis (1988).) We might suppose,

As a V-licensed adverb in postverbal position, it refers to the manner in which John learned French:

- (iii) John learned French stupidly.

Conjoined with another manner adverb, it has only the latter interpretation:

- (iv) John learned French slowly and stupidly.

Conjoined with another Pr-licensed adverb, it has only the former interpretation:

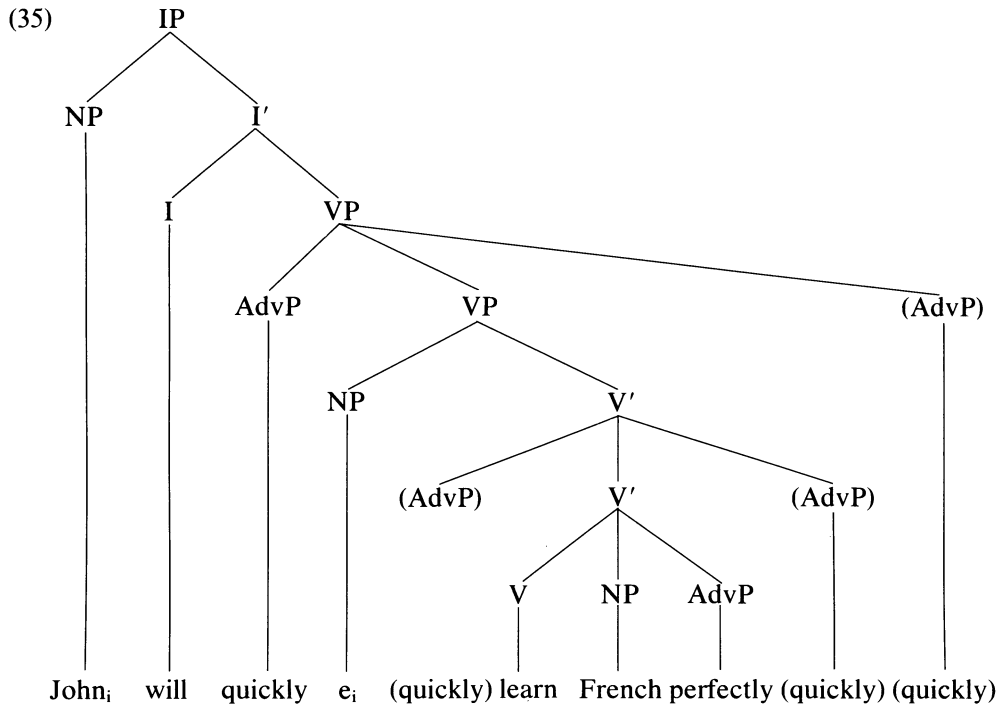
- (v) John stupidly and idiotically learned French.

Finally, it is not redundant to use the same adverb in both ways in the same sentence:

- (vi) John stupidly learned French stupidly.

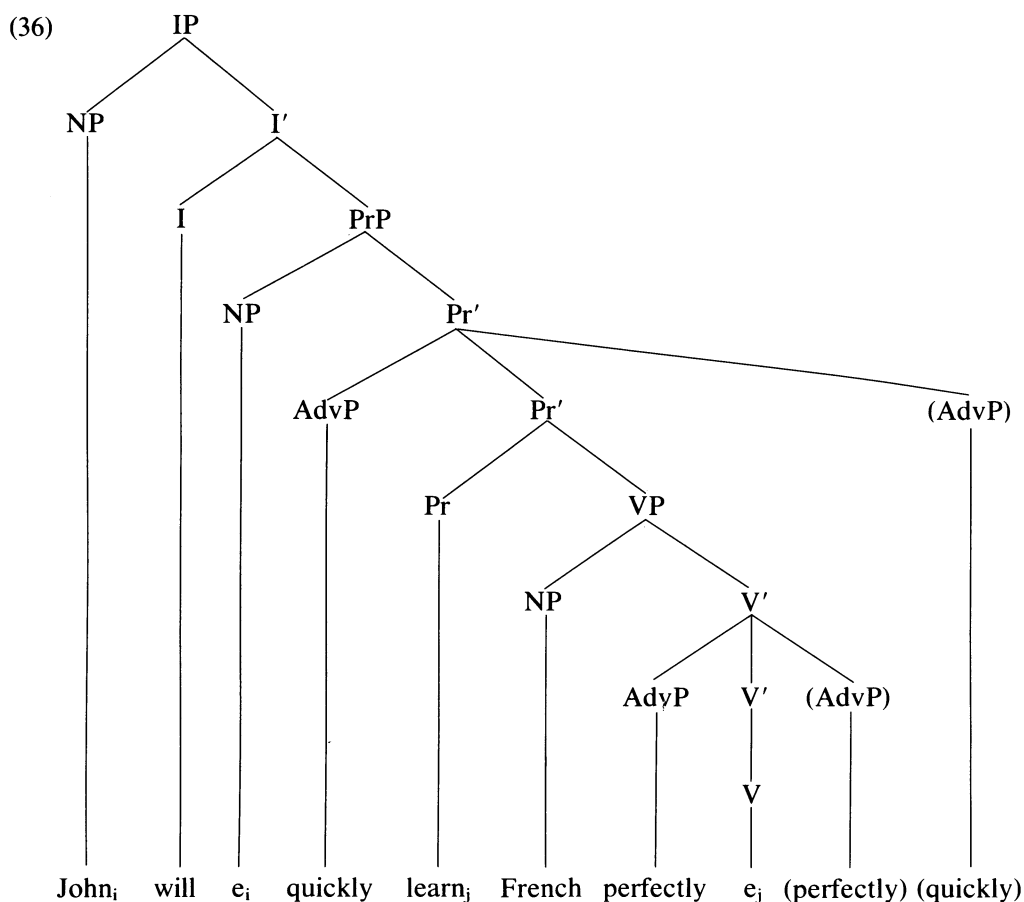
¹² This statement must be taken modulo heavy constituent shift. A sentence such as *John learned French quickly, almost perfectly* is acceptable as a transformed version of the stylistically awkward base form *??John learned French almost perfectly quickly*. In contrast, heavy constituent shift is not stylistically necessary in an example such as *John learned French almost perfectly very quickly*.

for example, that *perfectly* was generated as a complement to V under V', and *quickly* as an adjunct of either V' or VP, as in (35).



Alternatively, we might generate *perfectly* as an adjunct to V' and *quickly* as an adjunct to VP. There are two problems with any of these proposals: (a) assuming that adverb licensing is nondirectional will account for the fact that *quickly* can occur in either pre- or postverbal position, but leaves unexplained the fact that *perfectly* can only occur in postverbal position; (b) since both adverb types are licensed by V, there is no principled way of explaining the fact that they cannot exchange positions. In short, it appears that another head is needed for the purpose of licensing adverbs.

The needed head is, I suggest, Pr. Let us see how the observed facts can be explained under this hypothesis. Assume that adverbs such as *perfectly* are licensed by V and adverbs such as *quickly* by Pr. As stated earlier, I assume also that all of the adverbs discussed above are X' adjuncts. This yields the structures in (36). The fact that *perfectly* can appear only in postverbal position is now explained automatically by virtue of V-raising into Pr, which ensures that the verb is *always* to the left of the adverb, regardless of where it is generated in D-Structure. In contrast, adverbs such as *quickly* can appear either as left Pr' adjuncts or as right Pr' adjuncts, hence either to the left or to the right of VP. The fact that the two adverb types cannot exchange positions follows from the



fact that they are licensed by different heads. Furthermore, this analysis makes another correct prediction concerning the distribution of *perfectly*, namely, that it can appear either to the left or to the right of a complement:

- (37) a. John spoke French intimately to Mary.
 b. John spoke French to Mary intimately.
- (38) a. Mary jumped the horse perfectly over the last fence.
 b. Mary jumped the horse over the last fence perfectly.

This fact also rules out the possibility of analyzing *perfectly*-type adverbs as complements, since they would then be unable to cooccur with PP complements.

Finally, consider the well-known fact that adverbs in English resist being placed between a verb and its direct object, though not between a verb and a PP complement:

- (39) a. John spoke French intimately to Mary.
 b. *John spoke intimately French to Mary.

- c. John spoke to Mary intimately.
- d. John spoke intimately to Mary.

This restriction on the placement of adverbs in English is usually accounted for in the literature, following Stowell (1981), by means of the so-called adjacency requirement on Case assignment, which stipulates basically that accusative Case can only be assigned by the verb to an NP that it is adjacent to. Apart from the inherent implausibility of restricting Case assignment in this way, there are at least two empirical arguments against such an approach. First, adjacency is not a general requirement for Case assignment, even in English, since adverbs can occur quite freely between the subject and the I⁰ head that assigns it nominative Case:

- (40) John certainly will win the race.

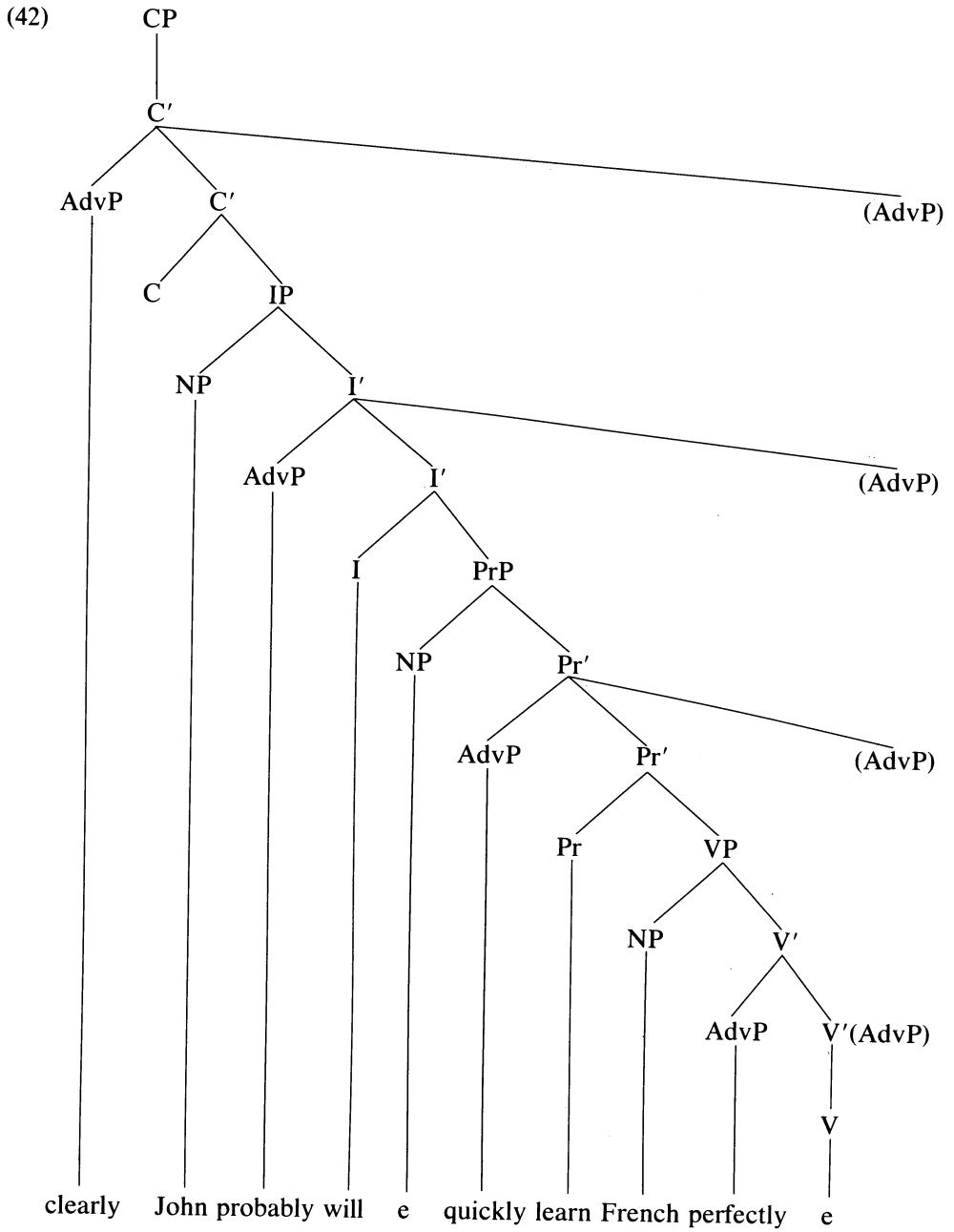
Second, the adjacency requirement simply does not hold in many languages, even in typologically quite similar languages such as French (see section 3.2.1 for further discussion):

- (41) Jean parle souvent le français.
Jean speaks often French

Hence, all that remains of the adjacency requirement is a language-specific condition on assignment of just a single Case—namely, accusative—hardly an explanatory theory.

In the theory proposed here, in contrast, this restriction on the occurrence of adverbs can be explained in purely structural terms. First of all, the fact that V-licensed adverbs such as *perfectly* cannot occur between the verb and its direct object follows immediately from the assumption that these adverbs are V' adjuncts, together with the assumptions that direct objects are in [Spec, V] and that the verb raises obligatorily into Pr⁰. These assumptions jointly ensure that there is simply no way of generating an adverb of this type between the verb and its object in English. Second, these same assumptions ensure that it is impossible to generate adverbs licensed by any other head between the verb and its object. Thus, a Pr⁰-licensed adverb, for example, will be generable either to the left of the raised verb or to the right of the whole VP complement of Pr⁰, but not in any other position. The possible positions for adverbs permitted by this theory are indicated in structure (42) for (34a).¹³

¹³ In order to accommodate examples such as *John will probably quickly learn French perfectly*, it will be assumed that modals and auxiliaries optionally move to Agr⁰ in English. Further support for this idea can be derived from the possibility of examples such as *John obviously will probably soon learn French*, in which the modal must have moved to Agr⁰ and *obviously* is an Agr-licensed adverb. If the modal fails to raise to Agr, then we derive *John obviously probably will soon learn French*. See also footnote 19 and the discussion of French in section 3.2.1.



Finally, the fact that other complements of the verb cannot be ordered between the verb and the direct object, as in the following examples, is also explainable in purely structural terms, given the phrase structure proposed here:

- (43) a. *John spoke to Mary French.
 b. *Mary persuaded to leave John.
 c. *The lions ate raw the meat.
 d. *Sue gave to Bill a book.
 e. *Mary persuaded that he should rest Bill.

In fact, all the ordering properties attributed to the adjacency condition on Case assignment reduce to a single structural property of English, namely, that it is Spec-initial, together with the assumption that the adverbs in question are X' adjuncts.

3.2.1 *Excursus on French: Pollock's Evidence* Chomsky (1992), following Pollock (1989) and Emonds (1976, 1978), has shown that a variety of differences between English and French can be explained under the assumption that finite verbs in French, but not in English, raise to I before PF. Assuming that the negative elements (*ne*)-*pas* and *not*, as well as certain adverbs such as *souvent/often* and the quantifier *tous/all*, are generated between I and V, the following facts fall out as a consequence:

- (44) a. *John likes not Mary.
 b. Jean n'aime pas Marie.
 (45) a. *John kisses often Mary.
 b. Jean embrasse souvent Marie.
 c. John often kisses Mary.
 d. *Jean souvent embrasse Marie.
 (46) a. *My friends love all Mary.
 b. Mes amis aiment tous Marie.
 c. My friends all love Mary.
 d. *Mes amis tous aiment Marie.

In contrast, infinitives and perfect participles with a lexical verb in French do not move to I until LF, as the following data show:

- (47) a. Ne pas sembler heureux est une condition pour écrire des romans.
ne not to seem happy is a prerequisite for writing novels
 b. *Ne sembler pas heureux est une condition pour écrire des romans.
ne to seem not happy is a prerequisite for writing novels

If the only two head positions available are I and V, then the same distribution of data should hold for adverbs as well. It turns out, however, that certain manner adverbs and *tous* can appear either before or after both infinitives and participles:

- (48) a. À peine parler l'italien, c'est rare.
 hardly to speak Italian that's rare

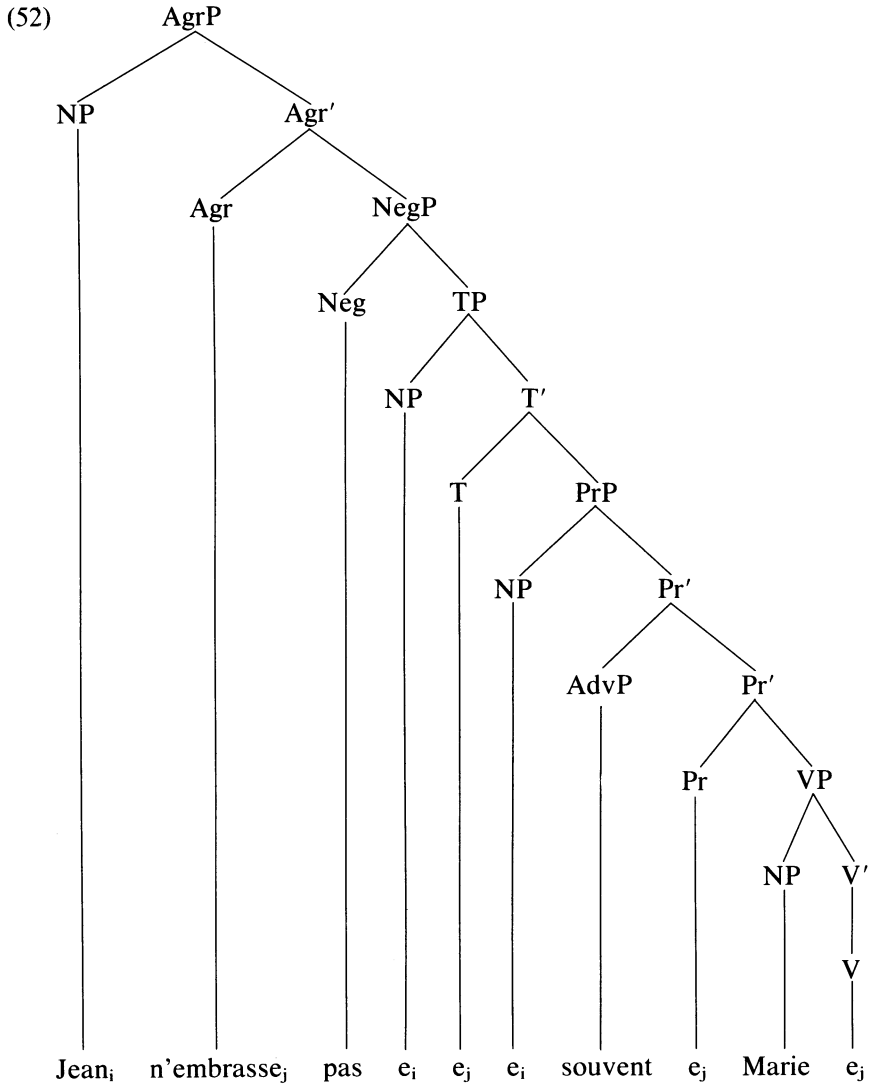
- b. Parler à peine l'italien, c'est rare.
to speak hardly Italian that's rare
- (49) a. J'ai vu mes étudiants tous sortir en même temps de la salle.
I've seen my students all leave at the same time from the room
- b. J'ai vu mes étudiants sortir tous en même temps de la salle.
I've seen my students leave all at the same time from the room
- (50) a. Pierre a à peine vu Marie.
Pierre has hardly seen Marie
- b. Pierre a vu à peine Marie.
Pierre has seen hardly Marie
- (51) a. Les enfants sont tous venus.
the children have all arrived
- b. Les enfants sont venus ?tous/presque tous.
the children have arrived all/almost all

Pollock argues that in order to account for these word order possibilities, the existence of an X^0 category intermediate between I and V must be posited. I have already suggested that though this conclusion is correct, the needed category is Pr, rather than Agr. If so, it follows that the observed variation in word order cannot be attributed to the optionality of V-movement to Pr (which is obligatory), but rather must be explained in some other way.

Assume, following Chomsky (1991b, 1992), that I is split into two categories T and Agr and that Agr is located *above*, rather than below, T. Assume, in addition, that NegP in French is generated between AgrP and TP and that adverbs such as *souvent* are licensed by Pr⁰. The distribution of data in (44)–(45) can then be accounted for by assuming that raising of verbs to finite T, and subsequently to Agr, is overt in French, whereas in English raising does not take place until LF, so that the verb remains in Pr⁰ in PF.¹⁴ The derivation of a French sentence containing both a negative and an adverb would thus look as shown in (52).

To explain the data in (47) and (48), we need only assume that raising of nonfinite lexical verbs in French from Pr⁰ to T⁰ can take place either before or after PF (accounting for (48)) and that the subsequent raising to Agr⁰ is delayed until LF (accounting for (47)), except (as Pollock notes) in the case of certain modal auxiliaries that apparently can raise to Agr⁰ either before or after PF:

¹⁴ The position of *tous/all* in (46) is accounted for in essentially the same way, though I will show in section 3.4.1 that *tous/all* are PrP adjuncts, rather than Pr' adjuncts, as illustrated by the fact that they can cooccur with Pr⁰-licensed adverbs, with the quantifier preceding the adverb: *The men will all quickly learn French perfectly*, **The men will quickly all learn French perfectly*.



- (53) a. Jean pensait ne pas pouvoir dormir.
Jean thought *ne* not to 'can' sleep
- b. Jean pensait ne pouvoir pas dormir.
Jean thought *ne* to 'can' not sleep

Finally, perhaps for the reasons suggested by Pollock, the first of a sequence of auxiliary verbs in English behaves just like the main verb in French. It therefore moves from T

to Agr before PF, thus accounting for the characteristic position of negation after the first auxiliary.¹⁵

Up to this point it may not be clear why the proposed description of the French facts is preferable to Pollock's, since both seem to make the same predictions. What shows that my account must be correct is that French has a class of adverbs that behave just like the V-licensed adverbs of English discussed earlier. Crucially, adverbs of this type are prohibited from appearing between the verb and the direct object in French, just as they are in English:

- (54) a. Jean parle le français parfaitement (merveilleusement, etc.).
 Jean speaks French perfectly (marvelously, etc.)
 b. *Jean parle parfaitement le français.
 Jean speaks perfectly French

Such a restriction is impossible to explain under Pollock's analysis, for the same reason it is impossible to explain under any standard analysis of the VP that assumes that both adverbs and direct objects are D-Structure complements of the verb. Furthermore, it is impossible to combine the analysis of direct objects proposed here with Pollock's assumption that the intermediate node between T and V is Agr. The reason is that movement to Agr crucially takes place either before or after PF for nonfinite verbs. However, it is no more possible for V-licensed adverbs to occur between nonfinite verbs and their objects in French than it is for them to occur between finite verbs and their objects:

- (55) a. Parler le français parfaitement, c'est rare.
 to speak French perfectly that's rare
 b. *Parler parfaitement le français, c'est rare.
 to speak perfectly French that's rare

Hence, movement to the intermediate Pr⁰ node must take place before PF in both finite and nonfinite clauses in both French and English. Note that in French, just as in English, V-licensed adverbs can cooccur with adverbs licensed by other X⁰ categories:

¹⁵ Note, however, that this analysis leaves unexplained the fact that in English T-licensed adverbs occur *before* a negative:

- (i) a. John will certainly not win the race.
 b. *John will not certainly win the race.

Probably the simplest explanation is that NegP in English occurs between TP and PrP, rather than between AgrP and TP. As mentioned in footnote 13, the fact that T-licensed adverbs can generally occur either before or after the first auxiliary in English (e.g., *John certainly will win the race*, *John will certainly win the race*) can then be explained by making movement from T to Agr optional. In French, in contrast, movement of both auxiliaries and main verbs from T to Agr is obligatory, as shown by the fact that T-licensed adverbs are absolutely prohibited in preverbal position:

- (ii) a. *Mes amis probablement/certainement m'ont aidé.
 my friends probably/certainly helped me
 b. *Je me demande si Jean jamais/certainement fut un homme rationnel.
 I wonder whether Jean ever/certainly was a rational man

- (56) En effet, Jean parle probablement souvent le français parfaitement.
 in fact Jean speaks probably often French perfectly

Furthermore, the position of V-licensed and Pr-licensed adverbs cannot be interchanged in French, just as in English:

- (57) a. Jean parle souvent le français parfaitement.
 Jean speaks often French perfectly
 b. *Jean parle parfaitement le français souvent.
 Jean speaks perfectly French often

Finally, as predicted, V-licensed adverbs in French can occur either to the left or to the right of a dative complement:

- (58) a. Jean parle le français parfaitement à ses amis.
 Jean speaks French perfectly to his friends
 b. Jean parle le français à ses amis parfaitement.
 Jean speaks French to his friends perfectly

I concur, therefore, with Pollock's conclusion that French and English share the same basic structures and that they differ only minimally in how far up lexical verbs are permitted to move. In order to accommodate the full range of data, however, AgrP must be assumed to occur between C and T, and the category between T and V must be Pr.

3.2.2 Further Excursus: Object Agreement in French Many languages exhibit both subject and object agreement. Why should this be so? Under the standard assumptions, subjects and objects have entirely distinct structures: the subject originates in a Spec position (either in [Spec, IP] or [Spec, VP], depending on the theory), whereas the object is a complement of the verb under V'. One advantage of the treatment of objects proposed here is that the existence of both subject and object agreement follows as a natural consequence if it is assumed that agreement morphology is associated with NPs in Spec positions. There are two ways of executing such a proposal. One way, developed by Koopman and Sportiche (1991) and Carstens and Kinyalolo (1989), is to regard agreement as the visible morphological realization of the relation between a Spec and its head. Under the theory proposed here, the possibility of both subject and object agreement follows as a consequence, since both are, by hypothesis, in Spec positions. Such a theory has the merit of being simple and straightforward. A second possibility, suggested by Chomsky (1991b), is to hypothesize that both subject and object agreement are themselves functional heads that project their own phrasal categories. We have already seen some evidence for the existence of a phrasal projection of subject agreement in French. The facts of past participle agreement in French, discussed by Kayne (1987), seem to provide evidence for the existence of a phrasal projection of object agreement. If in fact both subject AgrP and object AgrP are needed in French, then the revised analysis of Pollock's data proposed in the preceding section is unavoidable, for the reasons outlined by Chomsky (1991b).

The facts are that a past participle may agree with its direct object if it has been moved under cliticization (59a), passivization (59b), ergative raising (59c), or *wh*-movement (59d),

- (59) a. Jean les_i a repeintes e_i .
 Jean them has repainted
 b. Les tables $_i$ ont été repeintes t_i par Jean.
 the tables have been repainted by Jean
 c. Noémie $_i$ est allée t_i à l'école.
 Noémie has gone to school
 d. J'ai vu les tables que $_i$ Jean a repeintes t_i .
 I've seen the tables that Jean repainted

whereas if the object is in postverbal position, the past participle cannot agree with it:

- (60) a. *Jean a repeintes $_i$ les tables $_i$.
 Jean has repainted the tables
 b. Jean a repeint les tables.
 same

Suppose now that agreement morphology appears just in case two conditions are met: (a) the verb raises into the head position in AgrP; (b) some NP raises into the Spec position in AgrP. If these two conditions are met, then the verb and the NP in AgrP will agree. Consider now a passive sentence such as (59b). The Caseless object of the past participle in a passive must raise into [Spec, AgrP] on its way to its eventual landing site in [Spec, I]. The past participle itself must move to Agr⁰ on its way to Pr⁰. Therefore, at the point where both Agr⁰ and [Spec, Agr] are filled, overt agreement morphology will appear on the past participle:

- (61) les tables $_i$ ont [_{PrP} t_i ''' éték [_{VP} t_i ''' tk [_{PrP} t_i '' [_{Pr'} repeintes $_j$ [_{AgrP} t_i ' [_{Agr'} t_j ']
 [_{VP} t_i [_{V'} t_j]]]]]]]]]

The derivation of an unaccusative sentence such as (59c) will obviously be similar. In a transitive, active sentence such as *Jean a repeint les tables*, on the other hand, the object, already being Case-marked, will not move to [Spec, Agr]. Therefore, even though the past participle moves to Agr⁰ as usual on its way to Pr⁰, no agreement morphology will appear since only the first of conditions (a) and (b) above will be met:

- (62) Jean $_i$ a [_{PrP} t_i repeint $_j$ [_{AgrP} e [_{Agr'} t_j [_{VP} les tables [_{V'} t_j]]]]]]]

To account for (59a,d), it is sufficient to assume that the [Spec, Agr] is either an A- or \bar{A} -position, in which case null operators and clitics will move obligatorily into [Spec, Agr] before reaching their final position in S-Structure. It is difficult to see how a theory such as Koopman and Sportiche's (1991) can account for such data. It correctly predicts the occurrence of past participle agreement in the examples of (59), since in

every case there is an underlying object in [Spec, V]. But the failure of the past participle to agree with the object in transitive, active sentences such as (60a) seems inexplicable.

Finally, consider very briefly a language such as Swahili (Carstens and Kinyalolo 1989) in which verbs *always* agree with postverbal objects:

- (63) Mtoto mw -ema a-na-wa-penda wazazi wake.
 1child 1AGR-good 1AGR-PRS-2OA-love 2parent 2AGR-his/her
 'A good child loves his/her parents.'

We may simply assume that in such a language [Spec, Agr], rather than [Spec, VP], is the position in which accusative Case is assigned. Hence, both the object and the verb will always raise to AgrP, producing overt object agreement morphology in every instance.

3.3 Raising to Object and Quantifier Floating

Another interesting consequence of the claim that subjects and objects are structurally parallel is the following. Since Spec positions can in general be $\bar{\theta}$ -positions, it should be the case that object position, as well as subject position, is a possible $\bar{\theta}$ -position. In fact, Postal and Pullum (1988) have argued that one of the crucial tests for a $\bar{\theta}$ -position, namely, occurrence of expletives, holds for object position as well as subject position. This in turn makes it possible, contrary to the current view, to have raising-to-object (RO), as well as raising-to-subject (RS), without violating the θ -Criterion. An important empirical argument in support of RO can be derived from the facts of so-called quantifier floating in English and other languages. The basic observation, due originally to Maling (1976), is that certain quantifiers can "float" to the right of the NP they modify under two conditions: (a) if the NP is a subject; (b) if it is an object that has a predicative complement following it. Crucially, quantifier floating is not possible from objects that lack a predicative complement:

- (64) a. The men will all leave.
 b. We consider the men all fools/crazy.
 c. *I saw the men all.

Assume, following Sportiche (1988), that quantifiers do not float to the right, but rather are left stranded when an NP moves to the left. It follows, as Sportiche suggests, that a stranded quantifier is always possible in subject position, given some version of the internal subject hypothesis. In the particular version assumed here, the primary subject in [Spec, PrP] always moves to [Spec, IP] to be Case-marked, resulting in examples such as (64a):

- (65) [_{IP} the men_i [_{I'} will [_{PrP} all t_i [_{Pr'} leave_j [_{VP} t_j]]]]]

More importantly, however, the possibility of a stranded quantifier in *object* position in

examples such as (64b) also follows automatically, just in case RO exists, as the following structure makes clear:¹⁶

(66) [_{IP} . . . [_{PRP} we [_{PR'} consider_i [_{VP} the men_j [_{V'} t_i [_{PRP} all t_j [_{PR'} e fools]]]]]]]]

At the same time, examples such as (64c) are ruled out. Since there is no place the object NP could have moved from, stranding of the quantifier will simply not arise as a possibility.¹⁷

The only way of avoiding the conclusion that RO exists would be to assume that SC constructions such as (64b) are contained in an IP with a “defective” head:

(67) we consider [_{IP} the men_i [_{I'} I [_{PRP} all t_i [_{PR'} e fools]]]]

However, this would predict, incorrectly, that SCs should be able to occur with all of the various kinds of adverbs associated with IP:

- (68) a. *We consider the men certainly/surely/probably fools.
 b. *We regard the men as fools yesterday/for a week.

¹⁶ I will show in section 3.4 that stranded quantifiers are associated with PRO, as well as trace. However, *consider* is a raising complement, as shown by the fact that its object can be an expletive or an idiom chunk:

- (i) a. I consider it too hot in this room.
 b. They consider it strange that Mary left in such a hurry.
 c. I consider it an honor to be asked to speak.
 d. I consider the fat in the fire.

¹⁷ The facts of quantifier stranding thus argue against any theory of predication (Williams 1980, for instance) in which the direct object and a following phrase predicated of it do not form a syntactic unit. Note that if RO exists, then a separate operation of RS becomes not only unnecessary but impossible. Constructions traditionally analyzed as involving RS are thus treated as unaccusative RO constructions. The facts of auxiliary selection in Italian provide a strong argument in support of this conclusion. As is well known, the auxiliary *essere* must be chosen if the subject binds a direct object (Burzio 1981, 1986). Now consider the following sentence:

- (i) Giovanni era sembrato gradire il libro.
 Giovanni had seemed to like the book

Under the standard account of raising, the appearance of *essere* is inexplicable since subject-raising verbs such as *sembrare* do not take objects. But if, as hypothesized, *sembrare* is an unaccusative verb whose direct object is derived by RO, then the appearance of *essere* is completely regular. The S-Structure form of (i) would then be as follows:

- (ii) [_{PRP} Giovanni_i era [_{PR'} sembrato_j [_{VP} t_i' [_{V'} t_j [_{IP} t_i gradire il libro]]]]]]

The NP *Giovanni* starts out in D-Structure as the subject of the infinitive complement, raises to object position in the matrix clause, and finally moves into the subject position, where its binding relation with the trace in object position forces selection of *essere*. The facts of Italian strongly suggest (as argued in Bowers 1981:188–189) that sentences conventionally analyzed as instances of RS in English (e.g., *John seems to like the book*) must also be unaccusatives, despite the fact that there is no morphological evidence for such a derivation. The existence of related pairs such as *Mary proved John to be the culprit* and *John proved to be the culprit* further supports this claim, since these pairs are related in exactly the same way as transitive and unaccusative pairs such as *John rolled the ball down the hill* and *The ball rolled down the hill*. Without the rule of RO, together with the unaccusative hypothesis, the former would have to be treated as totally unrelated to the latter, thereby missing a generalization.

Furthermore, if SCs are IPs, it is unclear why they should not be able to occur in CP:¹⁸

(69) *I believe [_{CP} that [_{IP} the men_i [_{PrP} t_i e fools]]]

In general, if SCs are to be treated as IPs, some explanation for the fact that they do not behave like other “full” IPs will have to be found.

Given that RO is needed in any case to account for quantifier floating in SC constructions, there seems to be no good reason to refrain from extending it to exceptional Case-marking (ECM) constructions in general, thereby reviving, in a new and somewhat different guise, an analysis that was for a time standard in pre-GB days. As we would predict, quantifier stranding is quite generally possible in ECM constructions. An ECM sentence such as (70a) would therefore be derived as shown in (70b).

(70) a. I expect the men all to leave at noon.
 b. [_{IP} . . . [_{PrP} I [_{Pr'} expect_i [_{VP} the men_j [_{V'} t_i [_{IP} all t_j to [_{PrP} leave at noon]]]]]]]]]

It is difficult to prove conclusively that RO is involved in the derivation of infinitival ECM constructions using only the facts of quantifier floating (see, however, the arguments in section 3.5.1), because floating quantifiers in English can also occur before the auxiliary:

(71) a. The men all will leave at noon.
 b. The women each must buy a book.

Hence, it is difficult to rule out completely the possibility that ECM constructions with floated quantifiers have a structure such as the following:¹⁹

(72) I expect [_{AgrP} the men_i [_{IP} all t_i' to [_{PrP} t_i leave at noon]]]

There is, however, a way of demonstrating indirectly that RO must be involved in certain ECM constructions, though not in others. English complements are generally of three types: (a) complements whose subject is passivizable; (b) complements whose subject is not passivizable, but which can themselves be passivized; (c) complements whose subject is not passivizable and which are also not themselves passivizable. These three types are illustrated here:

¹⁸ Chung and McCloskey (1987) show that Modern Irish, in contrast, does have SC constructions with complementizers. They also demonstrate convincingly that these SCs lack I, though their subjects are governed and assigned Case. In instances where there is no external governor, they suggest accusative Case is assigned by some default mechanism. In the framework proposed here, we may achieve the same results in a simpler fashion by hypothesizing that Irish and English differ in whether Pr is a Case assigner or not. In English, Pr does not assign Case to [Spec, PrP]; hence, subjects must raise to [Spec, IP] or [Spec, VP] and PrP cannot be embedded in CP, assuming that CP is a barrier to government and Case assignment. In Irish Pr does assign Case to [Spec, PrP]; hence, subjects need not raise and nothing prevents PrP from being embedded in CP.

¹⁹ In order to account for the fact that I'-licensed adverbs may be ordered after the auxiliary, I suggested in footnote 13 that auxiliaries move optionally to Agr in English. This same device will also account for the examples in (71), if it is assumed that quantifiers can adjoin to IP, as well as PrP (see section 3.4.1). Assuming that there is a class of Agr-licensed adverbs, we then predict, correctly it would appear, the possibility of sentences such as *The men obviously all will probably quickly learn French perfectly*.

- (73) a. I expect the men to leave at noon.
 b. The men are expected to leave at noon.
 c. *(For) the men to leave at noon is expected.
- (74) a. Everyone would prefer (for) the men to leave at noon.
 b. *The men would be preferred to leave at noon.
 c. For the men to leave at noon would be preferred by everyone.
- (75) a. I wanted/got the men to leave at noon.
 b. *The men were wanted/gotten to leave at noon.
 c. *The men to leave at noon was wanted/gotten.

The existence of just these three classes of complements does not follow straightforwardly from the current theory without ad hoc stipulations, but can be derived quite simply from the theory proposed here. The first class of verbs are just those that undergo RO: they are IP complements that lack a Case-marking complementizer. Their subjects must therefore raise into object position in order to be Case-marked. Assuming that only direct objects can be passivized (see footnote 22), the fact that the whole clause is impassivizable follows automatically. The behavior of the second class can be accounted for by assuming that the complement is itself a direct object, hence located in [Spec, V]. Since the whole clause is the direct object, it follows that its subject cannot be passivized, whereas the clause itself can be. Finally, the third class of complements can be described in various ways, but the most plausible is to analyze them as CP complements that idiosyncratically take a null complementizer. In many dialects *want* in fact optionally allows the complementizer *for*; other verbs of this class, such as *like*, *wish*, *desire*, behave similarly. The complementizer (whether overt or null) will then assign Case to the subject, and raising will be prevented by the presence of the CP barrier. Since these constructions have no direct object, no passive form at all is possible.

3.3.1 *Pseudoreflexives* Consider the following examples:

- (76) a. John ate himself sick.
 b. Mary drank herself into a stupor.

Clearly, the reflexive object in these examples is not in a θ -position, since John is not construed as eating himself nor Mary as drinking herself. Rather, the interpretations are roughly 'John ate to the point of being sick' and 'Mary drank until she went into stupor', indicating that the object reflexive is really the subject of an SC. Furthermore, in contrast to other SC constructions, the choice of subject is not free: it can *only* be a reflexive, as the following data show:

- (77) a. Mary considers herself/Bill brilliant.
 b. Mary drank herself/*Bill into a stupor.
 c. John ate himself/*Mary sick.

There are also simple transitive verbs that occur only with a reflexive object:

- (78) a. John perjured himself/*Bill.
 b. John hurt himself. (in the nonagentive sense)

But now notice that under the standard SC analysis there is no unified way of describing both the reflexive idioms in (76) and those of (78), since the reflexive pronoun will be an object in (78) but not in (76). Furthermore, it will be necessary to complicate considerably the subcategorization conditions for verbs, permitting them to impose nonlocal conditions on the subjects of clausal complements, an enrichment of the theory for which there is no independent motivation. In no other instance that I know of does a verb require that the subject of its complement be a reflexive form.

If the theory proposed in the previous section is correct, however, then a unified description of these reflexive idioms is possible, since in S-Structure the reflexives in (76) will in fact bear the same grammatical relation to the verb as the object in a simple transitive sentence, though in neither case will they be assigned a θ -role by the verb:

- (79) a. [_{IP} . . . [_{PrP} John_i [_{Pr'} ate_j [_{VP} himself_i [_{V'} e_j [_{PrP} t_i [_{Pr'} e sick]]]]]]]]]
 b. [_{IP} . . . [_{PrP} John_i [_{Pr'} perjured_j [_{VP} himself_i [_{V'} e_j]]]]]]]

Hence, the existence of these obligatory pseudoreflexive idioms simultaneously provides strong evidence for the view that the object position is a possible $\bar{\theta}$ -position and for the view that RO is involved in the derivation of transitive SC complements. It is worth emphasizing that it is precisely the arbitrary and lexically idiosyncratic nature of the syntactic restriction in question that makes this a powerful argument in support of RO, since there is certainly no semantic motivation for such a restriction.²⁰

²⁰ It is also worth noting, incidentally, that SC constructions such as those in (76) pose serious problems for a nonstructural theory of predication such as that of Williams (1980), since the representations required by his theory violate the θ -Criterion.

Both anonymous reviewers for *LI* object to this argument, apparently on the grounds that the choice of reflexive is not in fact obligatory. One reviewer cites as counterexamples the following sentences (though I must note that (a) is totally impossible for me):

- (i) a. Roy ate his belly full.
 b. Mary drank her mate under the table.

However, the reviewer overlooks the fact that the presence of an obligatory reflexive is clearly a function not just of the verb, but of the verb plus the predicate in the SC. I still maintain therefore that in expressions of the form *NP¹ eat NP² sick* and *NP¹ drink NP² into a stupor*, there is a formal requirement that NP² be a reflexive pronoun coreferential with NP¹. Note that the examples in (i) in fact have just the *opposite* requirement, namely, that the object NP *not* be a reflexive:

- (ii) a. *Roy ate himself full.
 b. *Mary drank herself under the table.

Moreover, it is clear that this "antireflexive" requirement, just like the reflexive requirement, is a function of the whole idiom, consisting of the main verb *plus* the predicate in the SC. The second anonymous reviewer falls into the same error, remarking irrelevantly that idioms of the form *NP¹ laugh/drink NP² out of NP³* do not require that NP² be reflexive, particularly in the right context. Again, this ignores the fact that the presence or absence of a formal reflexive requirement is a property of the whole idiom. I can think of no story that will contextualize examples such as **Mary drank Bill into a stupor* and **John ate Mary sick*. Clearly, the *meaning* of idioms such as *eat X sick* and *drink X into a stupor* is such that there is a direct causal relation between

3.3.2 *VP-Fronting* Huang (1991) has noted that though the anaphor in a fronted complex *wh*-NP has a wider range of coreference possibilities than it does if it remains in situ,

- (80) a. Which pictures of himself_{i/j} did John_i think Bill_j liked?
 b. John_i thought Bill_j liked pictures of himself_{*i/j}.

the same is not true of fronted VPs:

- (81) a. Criticize himself_{*i/j} John_i thinks Bill_j never will.
 b. John_i thinks Bill_j will never criticize himself_{*i/j}.

Here the anaphor in the fronted VP can only be coreferential with the NP that would necessarily bind it if it remained in situ. Huang argues that this contrast can be explained if some version of the internal subject hypothesis is correct, for in that case the fronted constituent in (82) will contain a trace of the moved internal subject.

- (82) [[α t_j criticize himself_j] John_i thinks Bill_j never will t]

By Condition A of the binding theory, *himself* must be bound by the trace left by the moved internal subject, hence must be coreferential with it.

I shall now show that the category of α in structures such as (82) must be PrP. Consider first the following example:

- (83) Proud of himself_{*i/j} John_i doesn't think Bill_j will ever be.

A fronted AP behaves exactly like a fronted VP with regard to the coreference possibilities of the anaphor contained in it, suggesting that the fronted constituent, whatever it is, must also contain the trace of a raised internal subject:

- (84) [[α t_j proud of himself_j] John_i thinks Bill_j will never be t]

Clearly the same process is involved in VP-fronting and AP-fronting. But if the analysis of main clause and SC predication proposed here is correct, then the two processes immediately reduce to a single one, since α must be PrP in both cases. Furthermore, it is now possible to construct an independent argument in support of RO. Consider the following example:

- (85) Proud of himself_{*i/j} John_i doesn't consider Bill_j.

Once again, the coreference facts show that the fronted constituent must contain the trace left by a raised internal subject. In this instance, however, the subject of the SC

X's drinking and X's ending up in a stupor and between X's eating and X's ending up sick. Since there is obviously no *inherent* reason why the locution *Y drink X into a stupor* could not be used to mean 'Y (indirectly) cause X to be in a stupor by Y drinking', the reflexive requirement is simply an arbitrary formal property of the whole idiom, just as it is an arbitrary formal property of the verb *budge* that it must appear in the context of a negative element, unlike other verbs that are not so restricted.

is raised not to [Spec, I] but to [Spec, V], that is, to the object position. If RO were not involved in the derivation of these SC constructions, then we would expect to find fronted PrP constituents of the following sort:

(86) *Bill proud of himself John doesn't consider.

But such sentences are not even marginally acceptable, showing unequivocally that RO exists.

3.4 *Quantifier Floating Continued: Control Constructions*

If the general approach to floating quantifiers developed in section 3.3 is correct, then we predict floating quantifiers to occur quite generally in control constructions, both in full clauses and in SCs. This prediction is borne out by the facts:

- (87) a. I persuaded_i [_{VP} the men_j [_{V'} t_i [_{IP} all PRO_j to resign]]]
 b. The teacher ordered the two boys both to pay close attention.
- (88) a. [_{IP} . . . [_{PrP} we [_{Pr'} put_i [_{VP} the students_j [_{V'} t_i [_{PrP} each PRO_j [_{Pr'} e [_{PP} in separate desks]]]]]]]]]]]
 b. They returned the books all to their owners.
 c. I painted the walls all red.
 d. The trainer fed the steaks all to the lions.
 e. She put the two books both on the table.

The examples in (88) strongly suggest that all PP complements are simply D-Structure PrP complements with a structure of the sort indicated in (88a). The fact that the subject can be either NP-trace or PRO follows at once if, as hypothesized, [Spec, PrP] is not a Case-marking position.²¹ It would be tempting to conclude that the complement position is restricted to categories such as PrP, IP, and CP that are “complete functional complexes” (CFCs)—in other words, propositional in nature. However, we shall see in the next section that there is strong motivation for analyzing certain apparent objects as oblique complements.

I stated at the outset that I would show that both the SC theory and the complex predicate approach to SCs are correct. It should now be clear in precisely what sense this is true. The function of complementation is to combine a verb with a clause (full or small) or an oblique argument to form a one-place predicate (property), which is then predicated of the secondary subject. Thus, the verb and its complement do form a syntactic unit (namely, V'), as the complex predicate theory claims; yet it is also true, as the SC theory claims, that the secondary subject (by virtue of the trace or PRO that it binds) and the predicative element in the complement constitute an SC that is propositional in nature.

²¹ I am assuming, following Bouchard (1982), Bowers (1983a,b), Hornstein and Lightfoot (1987), Koster (1984), Manzini (1983), and Sportiche (1983), that control PRO is not ungoverned, as proposed by Chomsky (1981). Hence, it is an anaphor and the “PRO Theorem,” if it holds at all, holds only for “arbitrary” PRO.

3.4.1 *The Position of Floating Quantifiers* Sportiche (1988) assumes that stranded quantifiers are part of the moved NP in D-Structure. A floating quantifier results when the inner part of the NP is either moved or realized as PRO. This view predicts incorrectly that floating quantifiers should occur in any position from which an NP can move. In fact, the distribution of floating quantifiers is sharply limited. In particular, NP-movement from object position is impossible in English:²²

- (89) a. *The professors were fired all.
 b. *The books have disappeared all.

This suggests that floating quantifiers are base-generated as XP adjuncts, but only to the “propositional” categories PrP and IP. This accounts for the characteristic position of floating quantifiers after auxiliaries and before SC and infinitival complements:

- (90) a. [_{IP} the men_i [_{I'} will [_{PrP} all [_{PrP} t_i [_{Pr'} buy_j [_{VP} books [_{V'} t_j]]]]]]]]]
 b. [_{IP} he will [_{PrP} t put [_{VP} the books_i [_{PrP} all [_{PrP} PRO_i on the table]]]]]]]
 c. [_{IP} I expect [_{VP} the men_i [_{IP} all [_{IP} t_i' to [_{PrP} t_i leave]]]]]]]

Examples such as those in (89) could only be produced if quantifiers were permitted to adjoin to VP. Further confirmation for the correctness of this analysis can be derived from the marked contrast in acceptability between *wh*-extraction from object and subject position:

- (91) a. *the books that John read all
 b. ?the books that all were read by John
 c. the books that were all read by John

²² Sportiche (1988) claims that the French equivalents of (89) are grammatical. It is interesting to note, however, that he puts a question mark by examples with the unmodified quantifier *tous*, indicating that they sound better when modified by *presque*:

- (i) a. Les enfants ont été vus ?tous/presque tous.
 the children have been seen all/almost all
 b. Les enfants sont venus ?tous/presque tous.
 the children came all/almost all
 c. Les enfants ont dormi ?tous/presque tous.
 the children have slept all/almost all

Earlier (see p. 427), in discussing examples such as *Les enfants ont vu ce film tous* ‘The children have all seen this movie’, he remarks that a quantifier “may also appear sentence-finally, although this is less natural for a bare Q than for a modified Q (for example, *presque tous* ‘almost all’).” This suggests to me that the quantifier in (ia–c) is not a floating quantifier left by NP-movement, but rather the sentence-final quantifier that is always possible in French (though not in English: **The children have seen this movie all*). This suspicion is confirmed by the fact that there is no difference in grammaticality between (ia–b) and examples with an unergative verb such as (ic), as Sportiche himself notes. To account for this discrepancy, Sportiche is forced to the conclusion that there is a postverbal trace even in examples such as (ic), a *reductio ad absurdum*, in my view, and one that is entirely unnecessary if my analysis is correct. Interestingly, Sportiche also gives similar judgments for purported cases of *wh*-movement from object position,

- (ii) Les livres que j’ai lus ?(presque) tous sont de. . .
 the books that I read almost all are by

suggesting once again that Q-stranding in object position is impossible in French, as it is in English, and that examples such as (ii) are simply instances of the sentence-final quantifier that is always possible in French, though never in English. (Note that it is also possible that examples such as (ii) are being interpreted as a sort of topic-comment sentence, also possible in English: (*Of*) *the books that I read* ?(almost) all are by Balzac.)

Though perhaps slightly less acceptable than (91c) (in which the quantifier is adjoined to PrP), (91b) is far better than (91a), which is totally unacceptable.

3.5 *Dative Arguments*

I noted in section 3.3 that some sentential complements can be passivized, whereas others cannot, and I suggested that this can be accounted for by assuming that the former are objects, therefore in [Spec, VP], whereas the latter are complements. It has frequently been observed that there is a small class of verbs in English that, although transitive in form, cannot be passivized:

- (92) a. John went home./*Home was gone by John.
 b. Mary left the room angry./*The room was left angry (by Mary).
 c. John resembles Bill./*Bill is resembled by John.
 d. The package weighed 10 lbs./*10 lbs was weighed by the package.
 e. The book cost \$10./*\$10 was cost by this book.
 f. The book cost John \$10./*John was cost \$10 by this book.

Furthermore, it is quite generally the case that subject control verbs that are transitive in form lack passives,

- (93) a. *John is impressed (by Bill) as pompous.
 b. *The boys were made a good mother (by Aunt Mary).
 c. *The kids were failed (by Max) as a father.
 d. *The men were struck by the idea as nonsense.
 e. *The men were promised (by Frank) to leave.

whereas transitive object control verbs do passivize:

- (94) a. John was persuaded to leave.
 b. The boys were made good students by Aunt Mary.
 c. The idea is regarded as nonsense by everyone.

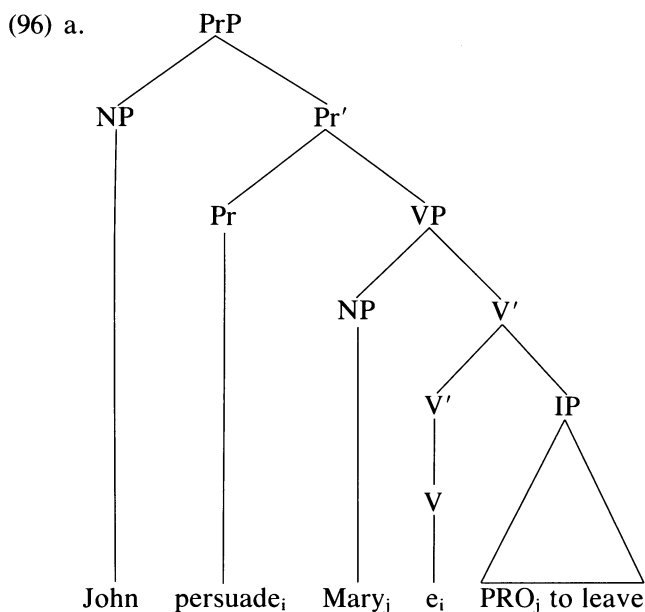
This phenomenon is commonly referred to in the literature as *Visser's Generalization*, though the standard account is that of Bach (1979). Bach's explanation, couched in Montague Grammar terms, was that the latter, but not the former, are transitive verb phrases (TVs), built up by first combining the verb with the complement, then applying this expression to the object. For the impassivizable verbs, he claimed, the order is just the opposite. If passive is formulated so that it only applies to TV expressions, then the generalization follows at once. Interestingly, Maling (1976) has observed that the very

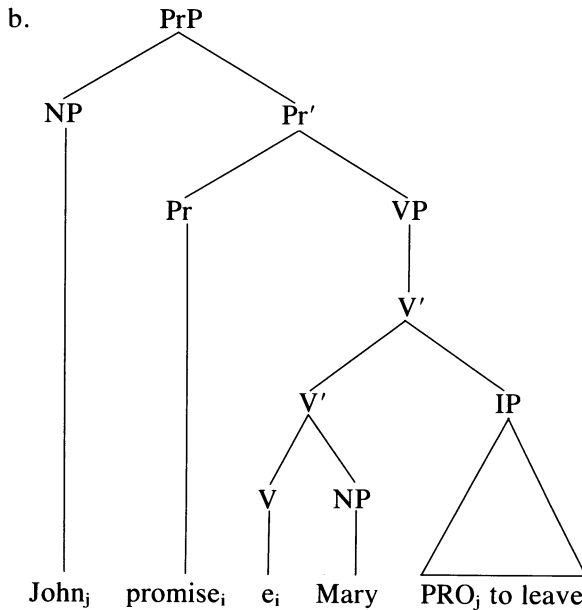
same subject control verbs that do not passivize also do not permit floated quantifiers to be associated with their objects:

- (95) a. *Bill impresses his friends all as pompous.
 b. *Aunt Mary made the boys all a good mother.
 c. *Max failed the kids all as a father.
 d. *The idea struck the men all as nonsense.
 e. *Frank promised the men all to leave.

These verbs are thus apparent exceptions to the generalization concerning floated quantifiers discussed in the previous section. Clearly, it cannot be an accident that the very same verbs that exceptionally lack passive forms are also apparent exceptions to the generalization that floated quantifiers only occur with objects that have a complement following them.

All of these facts can be explained in purely structural terms if we suppose that Bach's account is basically correct and that the apparent object of these impassivizable verbs is actually a complement, rather than a direct object (or secondary subject, as I have termed it), whereas the object of the passivizable verbs is a true direct object, generated in [Spec, V]. Specifically, let us assume the structures in (96a) and (96b) for sentences with *persuade* and *promise*, respectively.





Recall that in section 2 it was proposed that A-movement is restricted to Spec-to-Spec movement. It follows that *Mary* is passivizable in (96a) but not in (96b).²³ Furthermore, these structures make it possible to solve another traditional problem associated with these examples: the control problem. Suppose that the basic structural constraint on control is simply that PRO is controlled by the nearest c-commanding NP. It follows

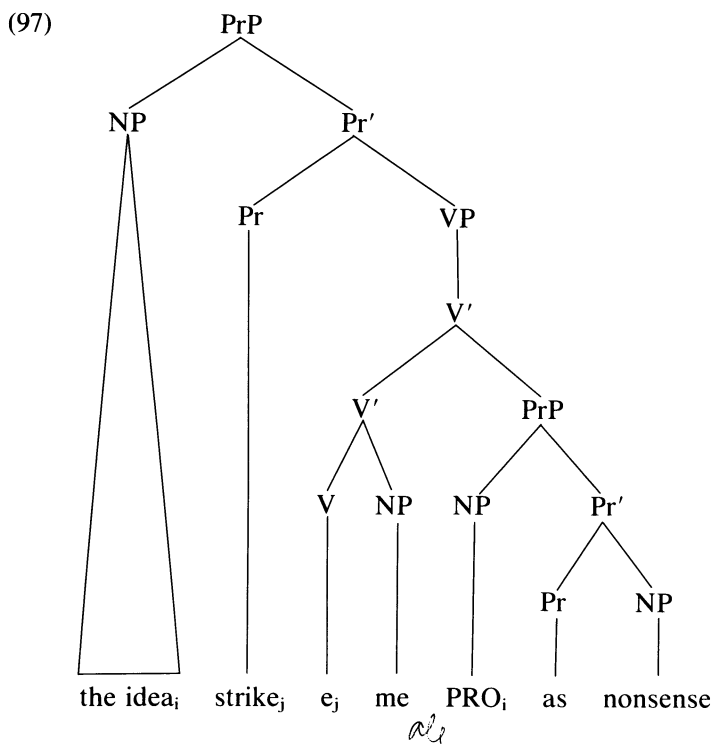
²³ It follows that passive applies only to canonical D-Structure objects (secondary subjects). This in turn provides further motivation for RO, which must apply to ECM complements in order for the subject of the complement to be in a position in which it can be passivized. The idea that passive only applies to object NPs was commonly assumed in pre-GB days, but was abandoned on account of the widespread assumption that the object position is an obligatory θ -position. This assumption is unwarranted, as has already been argued. In order to account for pseudopassives such as *The book was not looked at* and *Sue was taken advantage of*, I assume, as has frequently been suggested, that verb+preposition or idiomatic V+NP+P sequences are reanalyzed as complex verbs.

Larson (1991) proposes a solution to the control problem for *persuade* and *promise* that is similar to mine in certain respects. The main difference between the two proposals is that Larson analyzes *promise*-sentences as underlying dative constructions with a clausal object and a *to*-dative argument. This structure is ultimately realized, along the lines of Larson 1988, as a double object construction. A detailed critique of this approach to the double object construction is presented in section 4. Note that Larson's analysis does not generalize to all instances of subject-oriented predication, as mine does. Also, his account does not generalize to impassivizable verbs in simple sentences such as those in (92). In fact, Larson's explanation for Visser's Generalization does not assert that such structures are impassivizable at all, but rather that they simply lack an appropriate controller. This in turn entails, as Larson himself observes, that the choice of controller must be determined at the level of D-Structure. But this assumption appears to be contradicted by the fact that S-Structure as well as D-Structure subjects can be controlled:

- (i) a. John persuaded Mary to be kissed by Fred.
 b. Mary doesn't want to be kissed by Fred.
 c. Mary promised John to be kissed by Fred.

that the controller in (96a) must be the object NP *Mary*, whereas in (96b) it must be the subject NP *John*.

Finally, Maling's observation concerning quantifier floating follows directly from this solution to the control problem, since only in (96a) does the apparent object c-command the floated quantifier in the complement clause.²⁴ Examples such as (93a–d) are exactly like (96b) in structure, except that they contain an SC complement with a PRO subject. Thus, an example such as *The idea strikes me as nonsense* would be represented as shown in (97).



²⁴ Whether quantifier floating from the subjects of these verbs is possible is uncertain. In my judgment, examples such as the following, though not perfect, are certainly interpretable,

- (i) a. ?His friends impressed Bill all as pompous.
- b. ?The teachers made John all good mentors.
- c. ?His parents failed Henry both as role models.
- d. ?His ideas strike me all as nonsense.
- e. ?The men promised Frank all to leave.

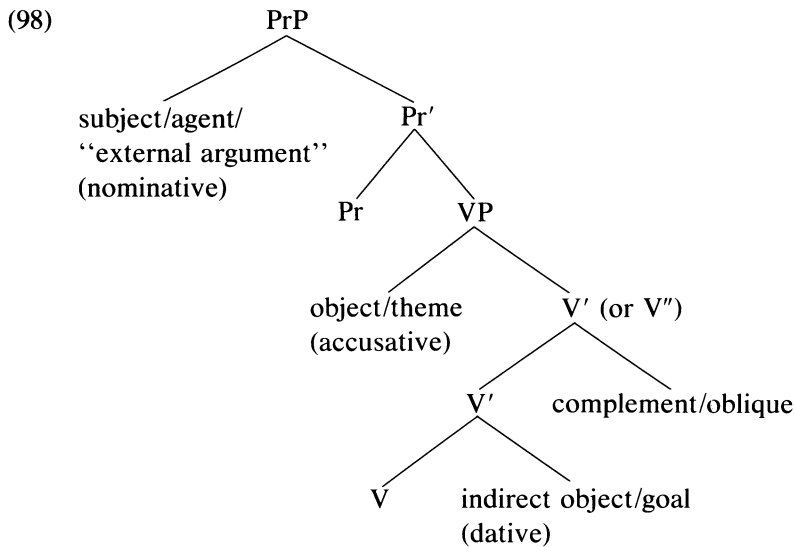
whereas those in (95) are virtually incomprehensible. Note that floated quantifiers are not very good with other SC adjuncts, such as those in (ii), suggesting that a more general constraint might be involved.

- (ii) a. ?He fed the steaks to the lion both raw.
- b. ?John put the patients in bed all drunk.

Similarly, the “circumstantial” and “depictive” SCs discussed by Roberts (1988) do not sound good with floated quantifiers, suggesting that they too are adjuncts (Pr'-adjuncts in this instance):

Once again, a passive such as (93d) is impossible because the apparent object is in reality a complement and therefore cannot move. Nor can the apparent object control PRO, because it does not c-command it. And likewise, a floated quantifier cannot be associated with the apparent object, because it does not c-command the SC containing the quantifier.

I have assumed so far that sentential complements are V' adjuncts. Alternatively, it might be assumed that V projects three bar levels and that sentential complements occupy a third argument position lower than the object, but higher than dative complements. I shall not try to decide between these alternatives here, but in any case the general argument structure of the PrP that emerges from this discussion is as shown in (98).



What independent evidence is there that complement sentences and SCs occupy an argument position in the VP distinct from the position for dative arguments? For one thing, there are sentences in which an SC or sentential complement actually cooccurs with both a direct object and a dative argument:

- OK: very*
- (iii) a. ?The men left the room all/both happy.
b. ?John drank the beers all/both flat.

The SCs that Roberts calls "resultative," on the other hand, do accept floated quantifiers, suggesting, if this conjecture is correct, that they might be complements rather than adjuncts:

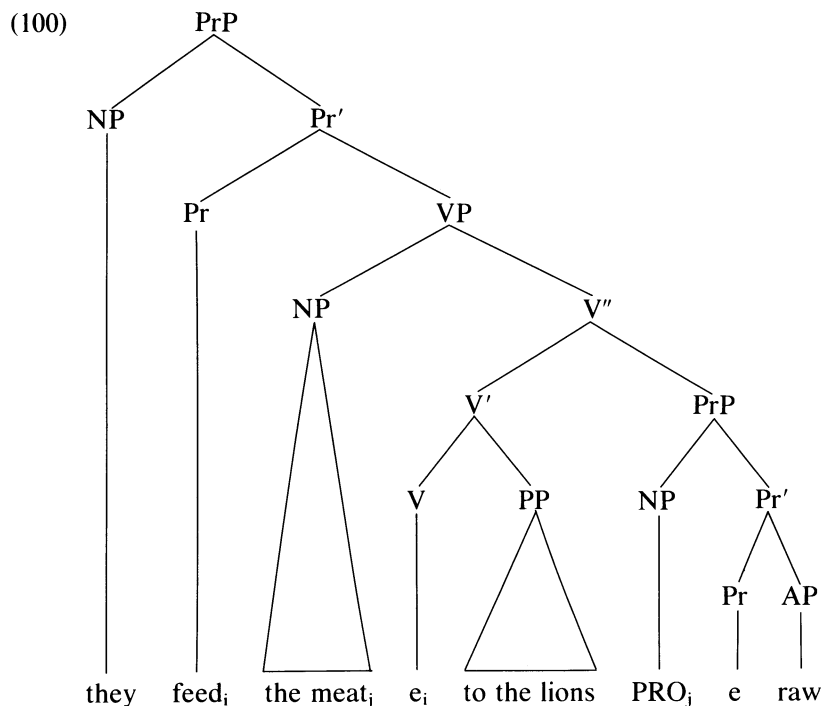
- (iv) a. John hammered the metal rods all/both flat.
b. Mary painted the doors all/both red.

Further support for this conjecture can be derived from the fact that these resultative constructions do not cooccur with a dative or goal argument:

- (v) a. *John hammered the metal rods into the wall flat.
b. *Mary painted the doors to Sue red.

- (99) a. They feed the meat_i to the lions PRO_i raw.
 b. John put the patient_i in bed PRO_i drunk. (cited in Roberts 1988:708, fn. 3)
 c. I sent John_i to the store PRO_i to get the paper.

Note that in these sentences the PRO subject of the SC or sentential complement is controlled by the direct object rather than the dative argument, exactly as predicted by the canonical structure in (98). The structure of (99a), for example, would be as shown in (100).



Returning finally to the impassivizable verbs in (92), it seems quite plausible to analyze the apparent direct object in each case as an underlying dative argument. In most instances, there is at least some independent evidence to support such an analysis. The apparent object in (92a) and (92b) is clearly a directional complement that somewhat idiosyncratically lacks a lexical preposition, as revealed by related examples such as *John went to his/the home* (NB **John went his home/the home*), *Mary went out of/away from the room*. The dative character of the apparent object in (92c) shows up in derived nominal forms such as *John's resemblance to Bill/the resemblance of John to Bill*. In the case of (92d) and (92e) it seems more plausible to suppose that the measure expressions \$10 and 10 lbs are predicates of an SC complement, and (92f) confirms

this hypothesis since the (impassivizable) dative object occurs to the left of the measure expression:

- (101) [_{PrP} e [_{Pr'} Pr [_{VP} the book [_{V'}[_{V'} cost (John)] [_{PrP} PRO \$10]]]]]

In short, a wide range of apparent exceptions to passive can be explained in a uniform manner in the framework proposed here, if it is assumed that some apparent objects are really oblique complements.

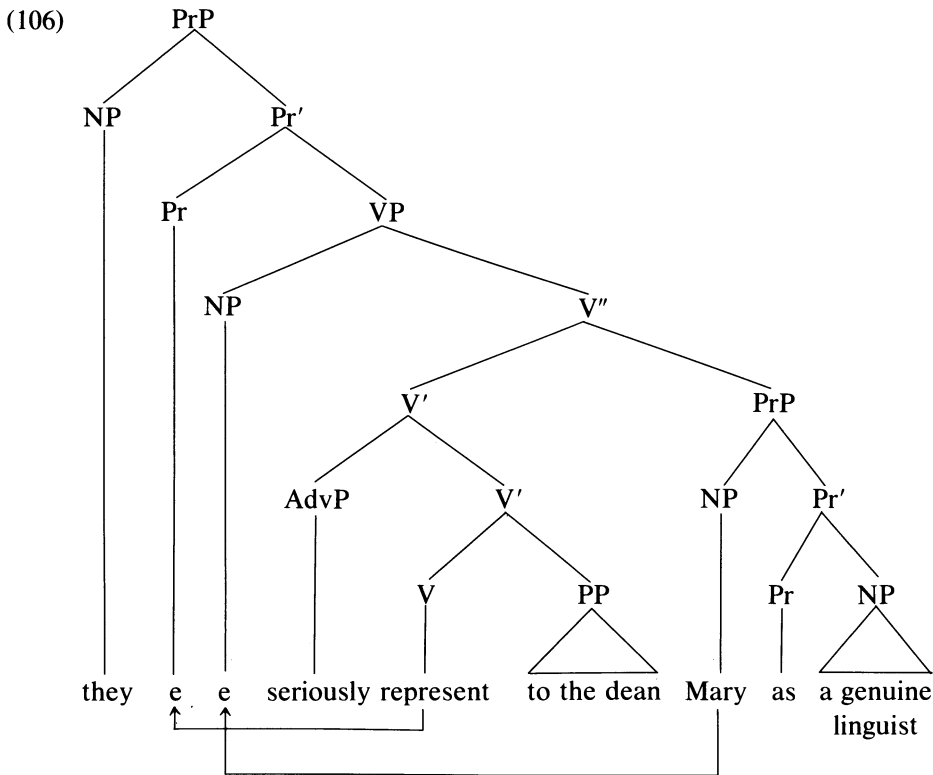
3.5.1 Raising to Object in Dative Constructions I have argued in previous sections that V-licensed adverbs and dative arguments both occur subordinate to, and to the right of, the direct object in VP. I have also claimed that raising-to-object exists. These assumptions, together with the analysis of sentential complements proposed in the preceding section, predict that the order of constituents in sentences containing a transitive raising predicate and either a dative argument, a V-licensed adverb, or both must be as follows:

- (102) V-Object-(Adverb)-(Dative)-Complement

This prediction is borne out by the facts:

- (103) a. *We proclaimed to the public John to be a hero.
 b. We proclaimed John to the public to be a hero.
 c. *We proclaimed sincerely John to be a hero.
 d. We proclaimed John sincerely to be a hero.
 e. *We proclaimed sincerely to the public John to be a hero.
 f. We proclaimed John sincerely to the public to be a hero.
- (104) a. *They represented to the dean Mary as a genuine linguist.
 b. They represented Mary to the dean as a genuine linguist.
 c. *They represented seriously Mary as a genuine linguist.
 d. They represented Mary seriously as a genuine linguist.
 e. *They represented seriously to the dean Mary as a genuine linguist.
 f. They represented Mary seriously to the dean as a genuine linguist.
- (105) a. *We proved to the authorities Smith to be the thief.
 b. We proved Smith to the authorities to be the thief.
 c. *We proved conclusively Smith to be the thief.
 d. We proved Smith conclusively to be the thief.
 e. *We proved conclusively to the authorities Smith to be the thief.
 f. We proved Smith conclusively to the authorities to be the thief.

These data then provide remarkable support for the clause structure (98), combined with raising-to-object. Thus, an example such as (104f) is derived as shown in (106). Historically, one of the main objections to admitting RO as a possible operation in the theory of grammar was the fact that it appeared to be string-vacuous. The examples in (103)–



(105), however, can only be derived by RO, and the movement in question is certainly not string-vacuous! Hence, this objection to RO no longer carries any force.

3.6 Summary

A wide range of syntactic evidence, then, converges on the claim that the basic structure of sentences is as represented in (98). According to this view, the VP contains all the arguments of the verb except for the external argument, arranged hierarchically so that the object (located in [Spec, V]) asymmetrically c-commands both sentential complements and dative arguments, whereas sentential complements in turn asymmetrically c-command dative arguments, which are complements of V. The external argument, on the other hand, is located in the Spec of a functional category Pr that takes VP as its complement. The surface order of the verb and its complements in a language like English arises from the obligatory movement of the verb into Pr⁰. The category PrP contains the basic “propositional content” of both sentences and small clause constituents, thus eliminating the need for ad hoc category labels such as SC for the latter. The semantic function of Pr (as outlined in the Appendix) is to create an unsaturated propositional function, which is then predicated of the external argument. In the concluding section, I attempt to show how the much-debated question of the structure of the double object

construction can be resolved in a far more satisfactory way than has hitherto been possible, given the framework proposed here.

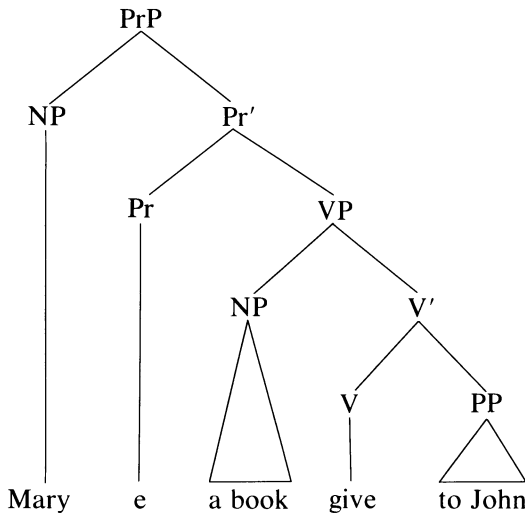
4 The Double Object Construction

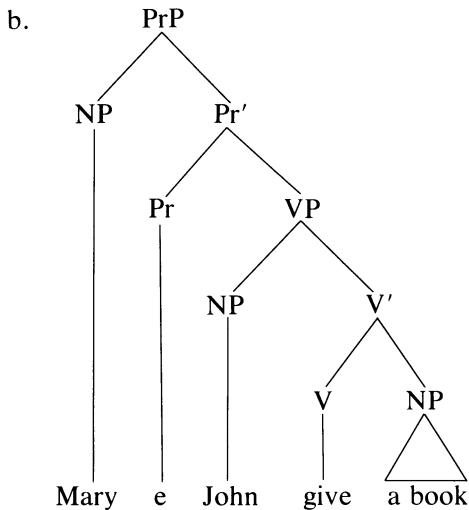
I shall now discuss in some detail a possible application of the proposed theory to indirect object constructions, particularly to the so-called double object construction in English. The most provocative analysis of the double object construction in recent years is that of Larson (1988). There are, however, serious difficulties, both conceptual and empirical, with Larson's approach. Hence, it is of some interest to see whether the approach to predication proposed here leads naturally to a more adequate explanation of the properties of this much-discussed construction.

Barss and Lasnik (1986) have shown that consideration of a variety of different phenomena in which the structural relation of c-command is known to play a crucial role leads to the conclusion that there is an asymmetrical relation between the two objects in the double object construction. The phenomena in question include the conditions on anaphor binding, quantifier-pronoun binding conditions, weak crossover effects, superiority effects, and the licensing conditions for negative polarity items. (See Larson 1988 for a convenient summary of the arguments.) If all of these phenomena do in fact involve c-command, then the necessary conclusion is that the indirect object in a double object construction c-commands the direct object. In constructions with a PP indirect object, on the other hand, it is just the opposite: the direct object must c-command the PP indirect object.

Within the framework proposed here, the facts presented by Barss and Lasnik could be accounted for directly by assuming the structures in (107a) and (107b) for the PP indirect object and double object constructions, respectively.

(107) a.





The correct surface forms would then be derived as usual by V-raising. However, a number of facts indicate that this analysis, appealing though it is, is not empirically adequate.

The first major problem is that both the direct object in (107a) and the indirect object in (107b) can undergo Q-float:

- (108) a. I gave the toys all to the children.
 b. I gave the men each a present.
 c. She sent the girls both presents.

If the arguments discussed earlier are correct, then both the direct object in (107a) and the indirect object in (107b) either must be raised from a PrP in the complement of VP into the secondary subject position or must bind a PRO subject of PrP. As a second approximation, then, we might assume structures such as (109a) and (109b). Though it is unclear whether the empty category in [Spec, PrP] in (109b) is trace or PRO, this analysis does succeed in preserving the c-command relations required by the Barss-Lasnik observations, while at the same time accounting for the fact that Q-stranding occurs in both dative constructions.²⁵

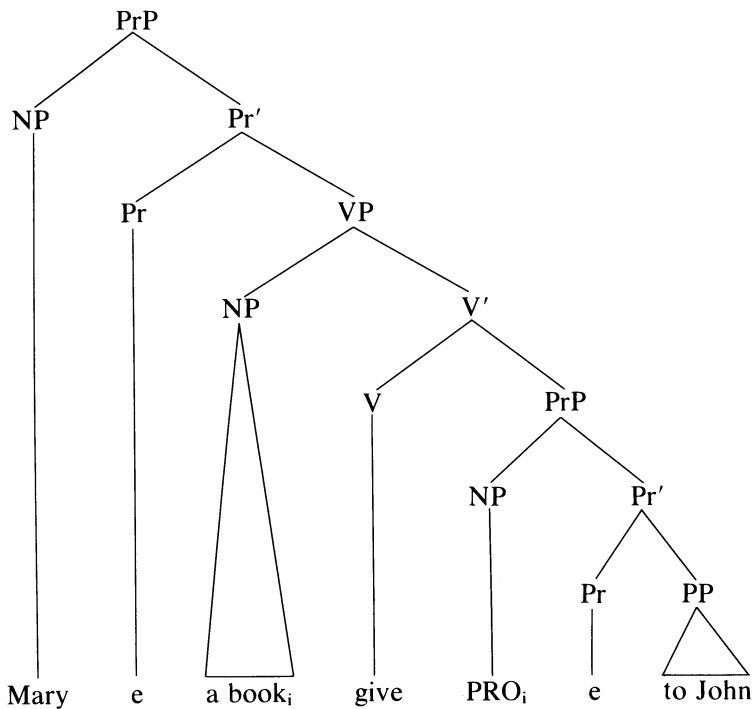
These structures are consistent with our assumptions so far and at the same time succeed in accounting for the fact that both constructions permit stranded quantifiers. (109a), the structure proposed for PP in direct object constructions, seems particularly

²⁵ Note, however, that the facts of Q-stranding rule out another potential analysis of the double object construction, namely, one in which the indirect object and the direct object are both in a [Spec, V] position (see Larson 1988):

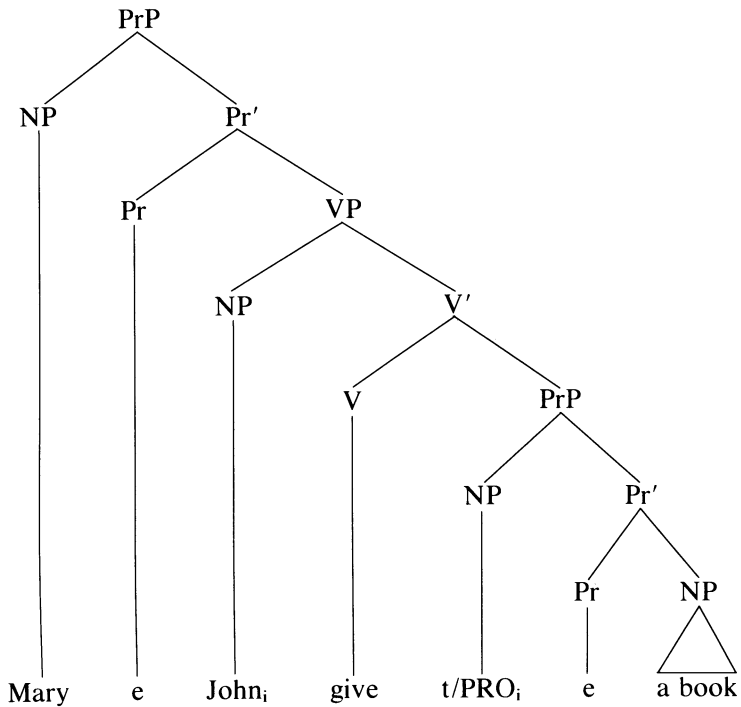
(i) [_{PrP} they [_{Pr'} gave_i [_{VP} John [_{V'} e_i [_{VP} a book [_{V'} e_i]]]]]]]

Here, the indirect object c-commands the direct object, as required by the Barss-Lasnik observations, but there is no way to derive sentences such as (108) with stranded quantifiers.

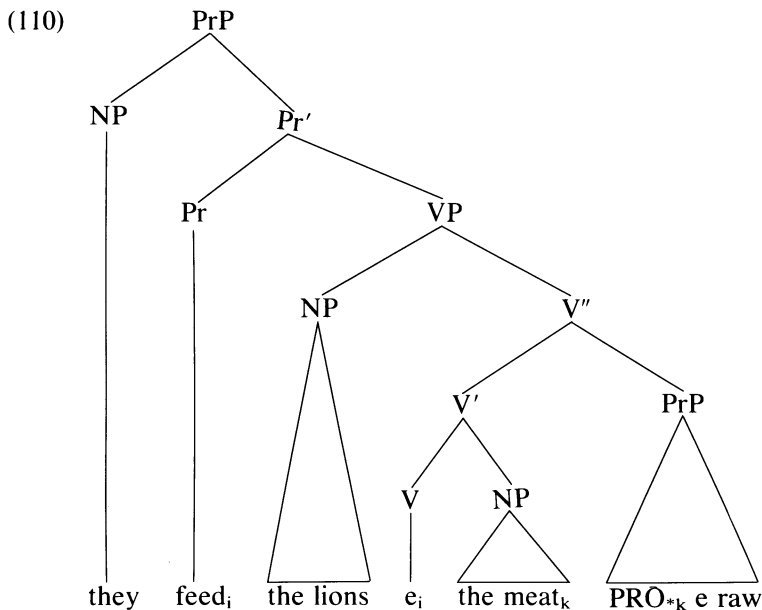
(109) a.



b.



unproblematic, since it accords completely with the general form of propositions proposed earlier. The structure in (109b) raises serious problems, however. First of all, the relation between the subject and the complement in the embedded PrP in (109b) cannot be an instance of the predication relation we have assumed up to now, since we obviously do not want to predicate the property of being a book of John.²⁶ Rather, the relation would have to be something akin to possession. Hence, this analysis will require at the very least some way of varying the content of Pr depending on syntactic context—a dubious move at best and one that would ultimately weaken the Pr relation to near vacuity. Second, the structure in (109b) cannot account correctly for the interpretation of SC adjuncts in double object constructions. It was shown in section 3.6 that the PRO subject of an SC is controlled by the direct object, rather than by the dative argument. Therefore, simply switching the positions of the direct and indirect object in the double object construction, as in (110),



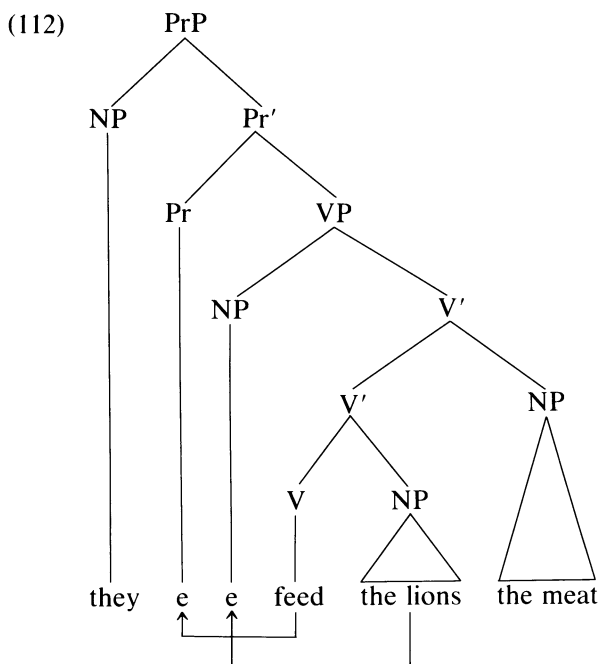
makes the false prediction that the indirect object, rather than the direct object, should control the subject of an SC complement in a double object construction:

- (111) a. They fed the lions the meat raw.
- b. He sent Mary the package unopened.
- c. I gave John the document unrevised.

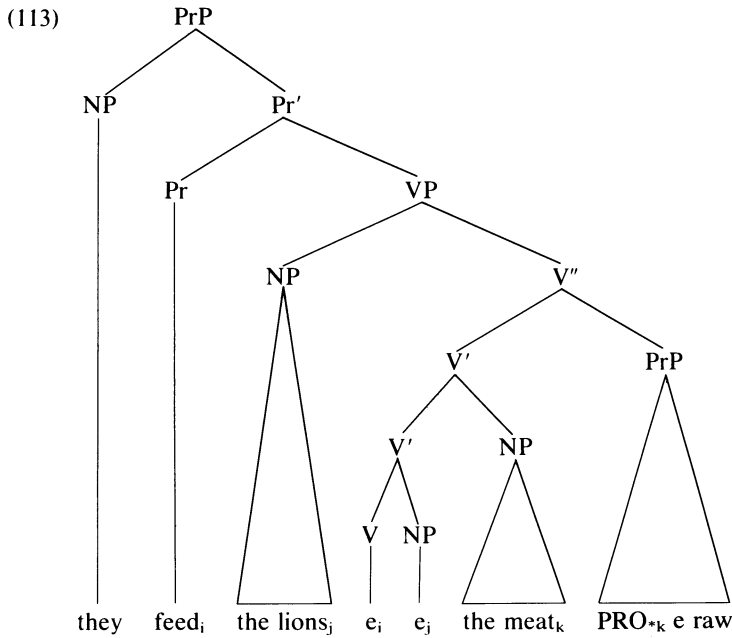
The problem is that direct objects, contrary to expectation, do not lose their ability to control SC complements in the double object construction.

²⁶ In particular, if the semantics for predication proposed in the Appendix is correct, then there is no way to make sense of a structure such as (109b).

Not only does this fact argue against any analysis of the double object construction in which the direct object is in complement position, but it also argues against any analysis of this construction that involves demotion of the direct object. Consider, for example, the analysis proposed by Larson (1988), according to which the double object construction is derived in somewhat the same way as passive sentences. According to Larson, the direct object is first “demoted” by a lexical process that optionally permits an NP in a [Spec, X] position to be realized in D-Structure as an adjunct of the X' constituent projected by X. This leaves the object position empty, permitting the indirect object, which is generated as a complement in D-Structure, to move into it, much as the direct object in passive sentences moves into an empty subject position. A sentence such as *They fed the lions the meat* would thus be derived as shown in (112).



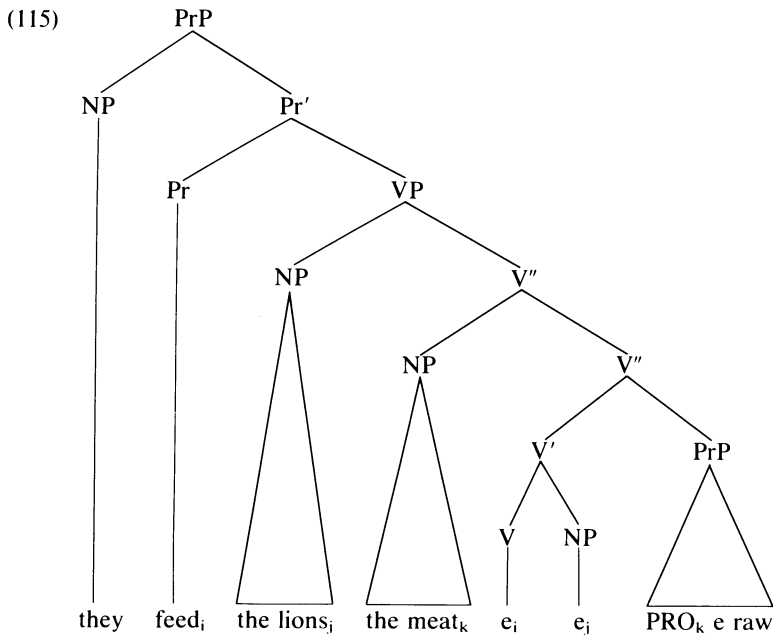
But now consider how this analysis is to be integrated with the analysis of SC adjuncts proposed earlier. There are two possibilities: the demoted direct object could be attached either as an adjunct of V' or as an adjunct of V". The first possibility is ruled out because the demoted direct object will fail to c-command the SC, as shown in (113).



Suppose then that the direct object is attached as a right adjunct of V''. This fails because it derives the incorrect constituent order:

(114) *they feed_i [_{VP} the lions_j [_{V'}[_{V'}[_{V'} e_i e_j] [_{PrP} PRO raw]]] the meat]]

The only possibility left is to adjoin the demoted object to the *left* of V'', as in (115).



This succeeds in generating the correct constituent order, while at the same time ensuring that the direct object c-commands the SC complement; but it fails for other reasons.

First, it is odd to assume that the demoted object is a left adjunct of V'' . Generally speaking, English only permits rightward-moved elements to be *right* adjuncts. Furthermore, there is evidence that base-generated adjuncts within VP should be restricted to right adjuncts, as well. Consider, for example, sentences containing rightward time adverbials. These must be either V'' or VP adjuncts, as is shown by the fact that they must appear after both dative arguments and SC adjuncts (modulo heavy constituent shift, of course):²⁷

- (116) a. John gave the package to Mary unopened yesterday.
 b. *John gave the package to Mary yesterday unopened.

If right adjuncts of either VP or V'' were permitted in English, then we would expect either or both of the following sentences to be grammatical:

- (117) a. *John gave yesterday the package to Mary unopened.
 b. *John gave the package yesterday to Mary unopened.

Similar arguments can be constructed for place adverbials as well. To make Larson's analysis work, then, it would simply have to be stipulated that demoted direct objects, unlike all other adjuncts in VP, are left adjuncts of V'' .

Second, Larson's theory, even modified along the lines just suggested, fails to account correctly for the interaction of dative shift and Q-stranding. Recall that stranded quantifiers can occur with objects only if the object has been moved or if it controls a clause with a PRO subject. We might expect, therefore, to find stranded quantifiers associated with the indirect object in the double object construction. That is in fact the case. However, the stranded quantifier does not appear *after* the demoted direct object, as Larson's theory would predict, but *between the indirect object and the direct object*:

- (118) a. They fed the lions both the meat raw.
 b. We gave the lions each a steak raw.
 c. *They fed the lions the meat both raw.
 d. *We gave the lions a steak each raw.

This shows unequivocally that any version of the movement analysis of the double object construction that assumes that the demoted object is a left adjunct of V'' (or V') cannot be correct. However, it was shown above that the demoted object *must* be a left adjunct in order to account for the facts of constituent order and control of the SC complement. We have thus derived a contradiction from which Larson's theory cannot escape.

²⁷ For evidence that rightward time adverbials are part of VP, see footnote 7.

The next question is whether there is *any* theory of the double object construction that can account for all the properties just discussed. Let us review briefly the properties that an adequate theory of the double object construction must account for:

- (119) a. The indirect object must c-command the direct object.
 b. The direct object must c-command an SC complement.
 c. The indirect object permits a stranded quantifier.
 d. The order of elements is V-IO-Q-DO-SC.

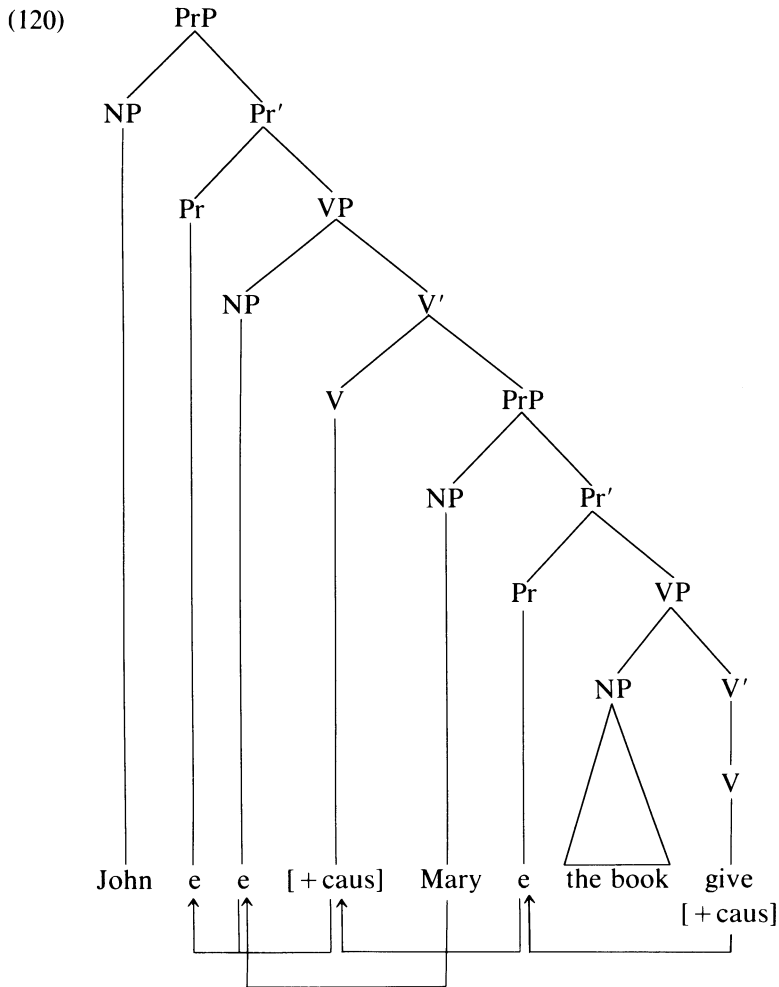
The basic problem, as the previous discussion has revealed, is that the facts of Q-stranding can only be explained if the indirect object is raised from some position that is to the left of the direct object and c-commands it. I shall now argue that the only fully adequate structure for the double object construction is what I shall term a *double predication* structure. In many languages, double predication is realized by a characteristic morphology, as in languages with productive processes of causativization, or in some cases by means of a compound verb form, such as the *faire*-construction in French (Kayne 1975). In English, however, double predication has no characteristic morphological reflex; it is simply incorporated in the meaning of specific verbs. In order to account for lexically incorporated causatives, I shall adopt certain features of the theory of “morphological checking” proposed by Chomsky (1992). In particular, suppose that certain verbs are listed in the lexicon with the feature [+caus]. This feature, being a morphological feature, must be “checked” prior to PF by being moved into the checking domain of some constituent containing this same feature. Suppose now that the double object construction is derived from a “double predication” structure containing a PrP complement to a verb with the feature [+caus] that is lacking any phonetic features. The [+caus] verb in the lower PrP will then be forced to adjoin to the “abstract” [+caus] verb in the upper PrP in order to have the morphological feature [+caus] checked. The structure I propose for the double object construction, then, is (120) (see page 642). The derivation proceeds as indicated. The verb *give* first raises into the lower Pr⁰ position as usual. It then adjoins to the higher V⁰ position, in order to check the morphological feature [+caus] with the feature [+caus] in the head position. The subject of the lower PrP then raises into the object position in the higher PrP in order to get Case. Finally, the verb *give* raises, as usual, into the Pr⁰ position in the upper PrP. The result of all these operations is the following S-Structure form:

- (121) [_{PrP} John [_{Pr} give_i [_v e]]_j [_{VP} Mary_k t_j [_{PrP} t_k t_j [_{VP} the book t_i]]]]]

According to this view, the double object construction is virtually identical in underlying form to SC causative constructions with *have* and *make* such as the following:

- (122) [_{PrP} John made the lions_i [_{PrP} t_i eat_j [_{VP} the meat t_j]]]

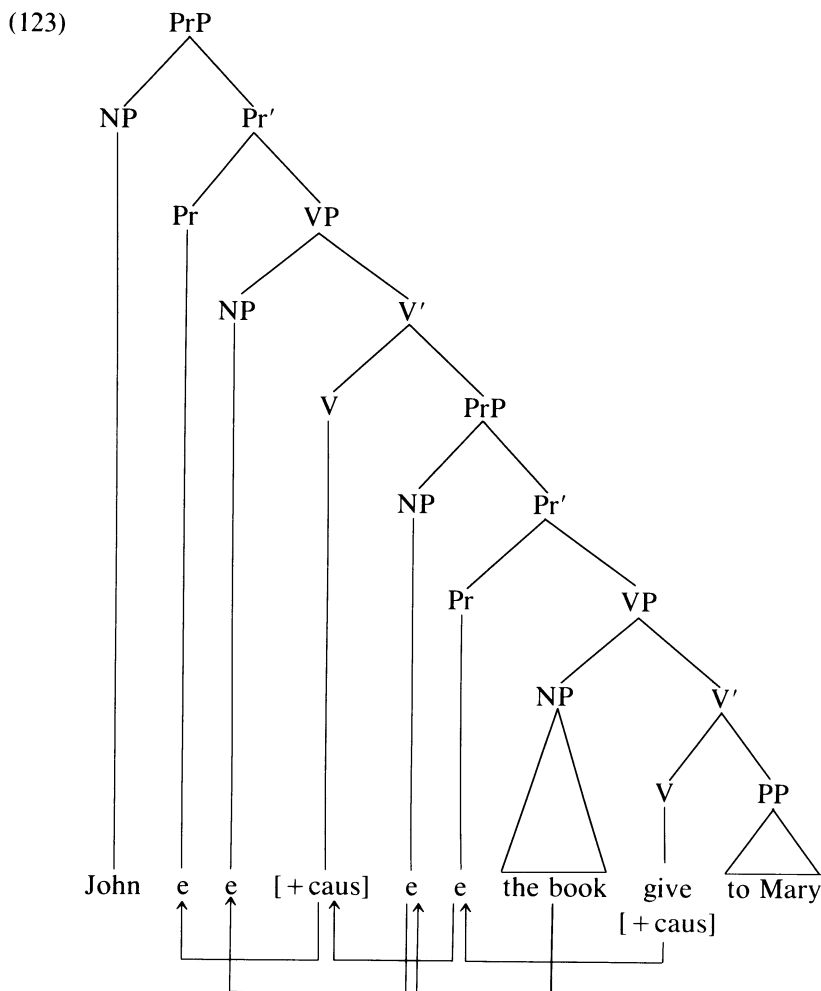
The only difference between the two constructions is that the explicit causative has a phonologically specified causative verb in the upper clause, whereas a double predication



structure has only a syntactic feature [+caus].²⁸ The double object construction is thus parallel in structure to an explicit causative construction, though lexically realized as a single verb.

Let us return for a moment to the indirect object constructions with a *to*-dative argument. The analysis proposed above treats the double object construction as a kind of causative construction containing a proposition similar in form to a sentence such as *John own/have the book*. Suppose that we were to embed under the causative verb a proposition similar in form to the sentence *The book belongs to Mary*, as in (123).

²⁸ See Fodor 1970, for an influential discussion of the semantic and syntactic difference between explicit and lexicalized causatives. Fodor's arguments were directed against an "abstract" Generative Semantics-style analysis of lexical causatives such as *kill*, which attempted to derive them from structures similar to those underlying explicit causatives such as *cause to die*. As Fodor showed, such an analysis is untenable. The



Without any further assumptions, such a structure will result in the surface form *John gave the book to Mary*. This analysis thus claims that the PP-dative sentence *John gave the book to Mary* is the lexicalized causative form of a surface sentence such as *The*

double predication analysis, however, is immune to Fodor's objections, because the embedded PrP is not a full clause. It might therefore be worthwhile to consider the possibility of deriving causative sentences such as *John melted the glass* from double predication structures of the following form:

- (i) $[_{PrP} \text{ John } [_{Pr'} \text{ melt}_i \text{ } [_{VP} \text{ the glass}_j \text{ } t_i \text{ } [_{PrP} \text{ } t_j \text{ } t_i \text{ } [_{VP} \text{ } v' \text{ } t_i]]]]]$

This would then leave the standard "unaccusative" type of derivation for so-called middle sentences such as *The book reads well*, *The clothes wash easily*. One argument in support of such an analysis is that it would make it possible to explain the fact (noted in Bowers 1981) that in certain cases a "middle" can be derived from a causative transitive, which in turn derives from an (ergative) intransitive: for example, *The horse gallops* → *John gallops the horse* → *The horse gallops well* (ambiguous). See also Chierchia 1989, for some discussion of verbs such as *melt*, suggesting that they might be analyzed semantically as covert causatives.

book belongs to Mary, and the double object sentence *John gave Mary the book* is the lexicalized causative form of a sentence such as *Mary has/owns the book*. It is interesting to note that there is at least one verb in English that can be used in all four constructions:

- (124) a. The book got to Mary.
 b. John got the book to Mary.
 c. Mary got the book.
 d. John got Mary the book.

In such cases both the noncausative structure in the lower PrP and the lexicalized causative form are realized in English. The verb *get*, therefore, may be listed in the lexicon as either [+caus] or [-caus]. (See footnote 28, for further possibilities along these lines.)

There are many arguments in support of this analysis. For a start, all of the properties listed in (119) follow without further elaboration. First, the indirect object c-commands the direct object, as required by the Barss-Lasnik observations. Second, the direct object c-commands an SC complement, as required by the control facts discussed above. Third, the indirect object is correctly predicted to have floated quantifiers associated with it, because it is raised from the lower PrP. Fourth, the proposed analysis explains why the floated quantifier is located between the indirect object and direct object, the reason being that the indirect object is raised from the Spec position of the lower PrP, which is of course to the left of the direct object. A causative analysis of the double object construction thus solves the major problem noted above with all alternative analyses that I am familiar with, namely, the fact that the indirect object must be raised from a position to the left of and c-commanding the direct object.

A fifth argument has to do with Case assignment. The basic problem, as noted by Chomsky (1981), is how to ensure that both NPs in the double object construction are assigned Case. Chomsky puts forward two possible solutions. The first solution distinguishes in a purely ad hoc fashion “structural” Case, which is assigned to the indirect object in a double object construction (NB: but to the direct object in a single object construction!), from “inherent” Case, which is assigned to the direct object in a double object construction. No independent support for this particular use of the distinction between structural and inherent Case has ever been offered, to the best of my knowledge. Clearly, it is purely stipulative. The other alternative is to assign the double object construction a structure of the form [_{VP}[_V give Bill] a book]. *Bill* would then receive structural Case from *V*, and *a book* would receive Case from *V'*. However, this structure is now ruled out, as we have already seen, by the Barss-Lasnik observations, which show that the indirect object must c-command the direct object, not vice versa. Under the double predication analysis, on the other hand, there is no problem at all with Case assignment: the indirect object ends up in the secondary subject position in the *upper* PrP, and the direct object is generated in the secondary subject position in the *lower* PrP. Hence, both objects are correctly assigned accusative Case by the regular principles of Case assignment.

- c. [_{CP} what_i did [_{IP} you_j [_{PrP} t_j give_k [_{VP} John_i t_k' [_{PrP} t_i t_k' [_{VP} t_i t_k]]]]]]]
- d. [_{CP} what_i did [_{IP} you_j [_{PrP} t_j give_k [_{VP} t_i' t_k' [_{PrP} t_i' t_k' [_{VP} t_i t_k to John]]]]]]]

Comparing these structures, it becomes evident that every structure except (128a) contains an \bar{A} -chain that terminates in a trace that is either (a) governed by a lexical X^0 category, or (b) governed by the terminal trace in a V-chain. This suggests a principle reminiscent of the ECP along the following lines:

- (129) The terminal trace in an \bar{A} -chain must be governed by a lexical category or by the terminal trace in an X^0 -chain.

(Note that this principle must apparently be restricted to \bar{A} -chains, since indirect objects can be passivized: *John was given the book*.) Such a principle is actually quite reasonable. What it does is to ensure that the D-Structure θ -position that terminates an \bar{A} -chain is identifiable either through a local relation with a lexical head or through a local relation with the terminal element in an X^0 -chain. In other words, it preserves, in an obvious sense, D-Structure head-argument relations in S-Structure. Structures such as (128a) violate this condition because the D-Structure position from which *who* originates is governed not by the V-trace that governs it in D-Structure, but by an intermediate trace in the V-chain, to which it bears no D-Structure grammatical relation. Interestingly, what brings about the violation is precisely the somewhat marked property characteristic of this construction, namely, the fact that the causative predicate in the lower PrP must raise into a higher PrP in order to check the morphological feature [+caus]. In an explicit causative construction with *have* or *make*, which has almost the same structure, extraction of the subject of the lower PrP does not result in a violation of (129):

- (130) a. Who did you have t take out the trash?
 b. Who did you make t do the dishes?

Although more research is surely needed to clarify the status of principle (129) and its relationship to similar principles such as the ECP, it is nevertheless quite encouraging that the double predication analysis permits at least a tentative explanation of a restriction on *wh*-movement that has thus far eluded explanation. In any case, I think it is safe to say that the double predication analysis comes closer to explaining all the remarkable properties of the dative constructions than any other analysis currently available.

5 Concluding Remarks

If the results of this investigation are correct, then it seems likely that the basic syntactic structure of propositions in natural language (ignoring variations in order) has the extremely restricted form represented in (98). One of the most interesting consequences of this conclusion is that certain kinds of syntactic representations that have been widely

assumed in the literature and that seem quite “natural,” when viewed in terms of the surface order of constituents, turn out to be quite untenable as a basis for stating significant syntactic generalizations (and, if the remarks in the Appendix are correct, for supporting an adequate logical semantics for natural language). For example, a seemingly simple and straightforward rule expanding VP into the head V plus a linear sequence of complements—indirect object, direct object, sentence or SC, and so on—turns out to be inadequate for describing the syntactic structure of English and other languages. What is needed instead is a bizarrely complicated hierarchical structure in which the underlying position of the verb does not even match its surface position! Similarly, the seemingly straightforward, natural assumption that the subject and the predicate of a simple sentence are sisters within a single category such as VP or S also turns out to be misguided. What is needed instead is a strange bipartite structure, the head of which (Pr) is a highly abstract category only marginally realized in any direct form in the surface phonetic forms of English (though it can be associated with a rich variety of morphological forms in languages with extensive agreement systems). On the other hand, the principles that give rise to these structures are maximally simple and general. Basically, nothing needs to be assumed other than an extremely restricted version of X-bar theory that applies uniformly to a small inventory of lexical and functional categories whose syntactic distribution and meaning are largely fixed by Universal Grammar. I have tried to demonstrate that positing the existence of these strange and “unnatural” structures leads to a more restricted theory of movement rules, as well as permitting the elimination of many language-specific statements and ad hoc stipulations.

Assuming that these arguments are correct and that the syntactic representations in question are in fact empirically motivated on syntactic grounds, it is all the more remarkable that they appear to be nearly optimal for supporting a simple and general mapping of syntactic structures onto the independently motivated logical representations needed for a formal account of meaning. Surely no one could hope for a better result! Many linguists, I believe, have had the strong intuition that this is the way natural language must be, but until recently the tools that would make it possible to prove the truth of such conjectures were simply not available. It seems to me that there is now some hope that the insights of thirty years of research in the syntax of natural language can be combined with the richer and more articulated systems of representation in formal semantics that are currently being explored to make real progress in understanding the relation between form and meaning in natural language.

Appendix: The Semantics of Predication

In this appendix I sketch briefly a possible logical semantics for predication, based on a property theory of the type proposed by Chierchia (1985, 1989) and Chierchia and Turner (1988). I then show that given the syntax proposed in this article and the semantics proposed by Chierchia, there is a simple, universal mapping relation between the two. The remarks in this section thus constitute, at a minimum, an “existence proof,” dem-

onstrating that there is a logical semantics onto which the syntax proposed here can be mapped in a “transparent” fashion. To the extent that there are independent, purely semantic arguments for doing the semantics of natural language in this way, as Chierchia has argued, a stronger claim is justified, namely, that the considerations brought forward in this appendix constitute independent evidence in support of the theory of predication and clause structure that I have attempted to justify in the text primarily on syntactic grounds.

Classical theories of logical semantics assume just two basic types: the type of entities, designated by the symbol ‘e’, and the type of propositions, designated by the symbol ‘t’. All other types are derived from these two. Properties are not primitives in such a theory, but rather are reconstructed as propositional functions (1-place predicates, or intransitive verbs), of type $\langle e, t \rangle$, which combine with entity expressions to form propositions. 2-place predicates, or transitive verbs, are expressions of type $\langle e, \langle e, t \rangle \rangle$, that is, something that combines with an entity expression to form an intransitive verb (which in turn combines with an entity expression to form a proposition). In this way, expressions with any arbitrary number of arguments can be represented, as well as other types of expressions, such as sentence modifiers (of type $\langle t, t \rangle$), verb modifiers (of type $\langle \langle e, t \rangle, \langle e, t \rangle \rangle$), and so forth. How do the types provided by the classical theory map onto the syntactically motivated categories of natural language? Take, for example, a standard set of phrase structure rules such as the following:

- (131) a. $S \rightarrow NP VP$
 b. $VP \rightarrow V$
 c. $VP \rightarrow V NP$

The category S obviously corresponds to expressions of type t, and VP expressions are uniformly of type $\langle e, t \rangle$. Verbs are of course of different types, such as $\langle e, t \rangle$, $\langle e, \langle e, t \rangle \rangle$, $\langle e, \langle e, \langle e, t \rangle \rangle \rangle$, and so on, depending on how many arguments they require. In contrast, the relation between classical type theory and the syntactic representations proposed in this article is quite opaque. The category PrP would of course correspond to the type t of propositions and the category VP to the type $\langle e, t \rangle$ of propositional functions. However, the intervening categories Pr and Pr’ correspond to nothing at all in the semantics. Note that precisely the same difficulty arises under the current assumption that S is the lexical projection of I. Of course, one can always stipulate in an ad hoc fashion the relation between syntactic rules and semantic types, but considerations of learnability strongly suggest that the principles connecting syntax and logical form should be simple and universal. The strongest possible hypothesis would be that, aside from the syntactic and semantic properties of specific lexical items, the child must learn nothing concerning the relation between syntactic rules and categories and semantic types, the mapping being completely determined by principles of Universal Grammar.

I turn now to a rather different approach to the logical semantics of natural language. Following Chierchia (1985, 1989), I shall assume that the representations of logical form

are drawn from a multisorted first-order language with four basic sorts: u , p , π , e (the universal sort), plus the predication relation $\cup: \pi \rightarrow \langle e, p \rangle$ and its inverse $\cap: \langle e, p \rangle \rightarrow \pi$. p is the type of propositions; π is the type of properties; and u is the type of basic entities. Since properties and propositions are basic types in this theory, there is no direct connection between them, as there is in the classical theory. Therefore, in order to predicate a property of some entity to produce a proposition, it is first necessary to turn that property into a propositional function, that is, a “Fregean” unsaturated structure that must combine with an entity expression to form a proposition. That is precisely the function of the predication operation ‘ \cup ’, which maps property expressions onto propositional functions of type $\langle e, p \rangle$. (The inverse operation ‘ \cap ’, which might be termed *nominalization*, maps propositional functions onto properties; it will not concern us further here.) This propositional function then combines with another expression to form an expression of type p , a proposition.

But now notice that given this ontology, there is a straightforward correspondence between the semantics of predication and the syntax of predication proposed here. Assume that the semantic function of Pr is to map properties (expressions of type π) into propositional functions (expressions of type $\langle e, p \rangle$). In other words, assume that the translation of Pr in logical form is simply ‘ \cup ’. Assume in addition that phrases of category VP map onto expressions of type π , as do predicate APs, NPs, and PPs. It follows that if r is the translation of a phrase of category YP , of type π (regardless of its syntactic category), then the translation of $[_{Pr} Pr YP]$ is simply $\cup r$, of type $\langle e, p \rangle$, and the translation of PrP is $\cup ru$ (u an individual of any sort), of type p . There is thus a straightforward, one-to-one mapping between the categories of syntax and the types of their translations in logical form. Given a property semantics of this kind, it immediately becomes possible to assign a precise meaning in logical form to the hypothesized functional category Pr and to its X-bar projections Pr' and PrP .

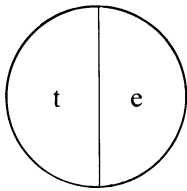
Phrases of the category PrP involve what I have termed *primary predication*, to which we have now given a formally precise definition at the level of logical form. Phrases of category VP , on the other hand, I have suggested are properties, expressions of type π . These property expressions can themselves contain one or more arguments, and I suggested in the text that there is a certain syntactic parallelism between the formation of PrP and the formation of transitive VP , in the sense that both involve combining an NP with some phrase to form a new phrase. To account for this parallelism at the semantic level, I assume that a transitive V' is of type $\langle e, \pi \rangle$, what might be termed a *property function*. I have suggested that the process by which transitive VPs are formed might appropriately be referred to as *secondary predication*. Even though they are formally parallel in certain respects, however, there are also fundamental differences between PrP and VP . A PrP is what Chomsky (1986) has termed a *complete functional complex* (CFC), meaning that it can stand on its own as a complete “thought,” or “information unit,” as it is termed by Chierchia and Turner (1988). A transitive VP , in contrast, is not a CFC in this sense. This difference is accounted for by virtue of the fact that

propositions are of type p , and therefore have truth values, whereas transitive verbs, which are of type π , do not. As was pointed out in footnote 5, syntactic theories in which the primary and secondary subject are assigned to phrases of the same category have no obvious way (apart from stipulation) of explaining this fundamental difference between primary and secondary predication. The theory proposed here, in contrast, explains both the formal parallels between primary and secondary predication and their fundamental differences.

At this point, let me summarize the previous discussion by comparing the different types of entities assumed in the classical theory (132a) and Chierchia's property theory (132b), along with the kinds of syntactic categories they naturally map onto.

(132)

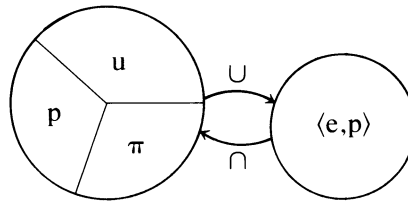
a.



entities: e
 propositions: t
 properties: $\langle e, t \rangle$

$S \leftrightarrow t$
 $IV \leftrightarrow \langle e, t \rangle$
 $TV \leftrightarrow \langle e, \langle e, t \rangle \rangle$
 $TV/T \leftrightarrow \langle e, \langle e, \langle e, t \rangle \rangle \rangle$

b.



basic entities: u
 propositions: p
 properties: π
 propositional functions: $\langle e, p \rangle$

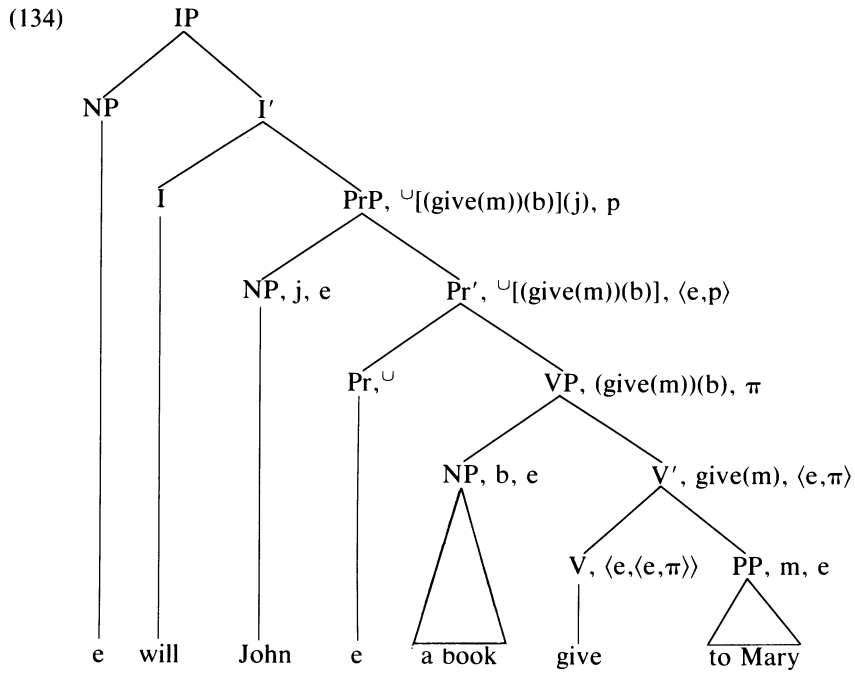
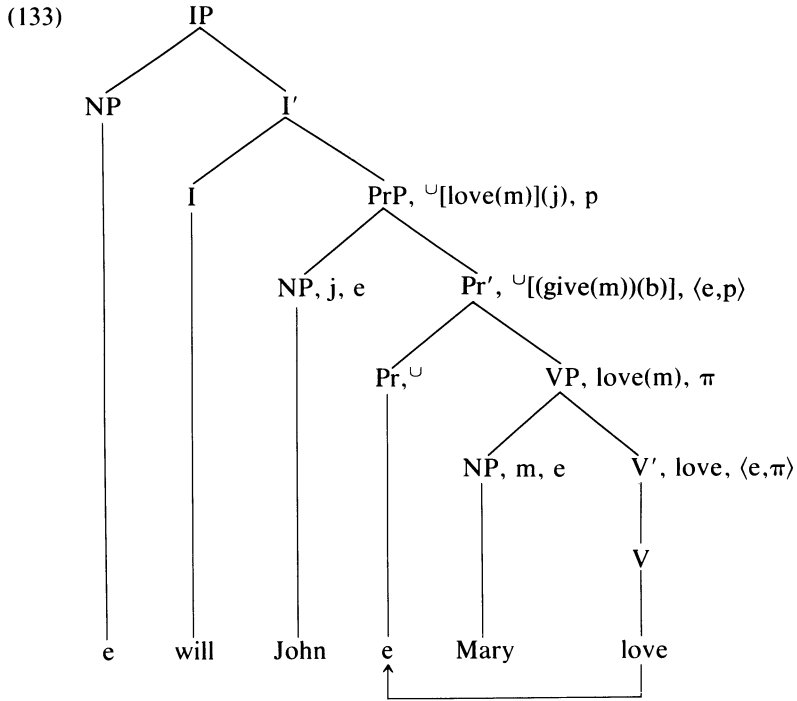
$PrP \leftrightarrow p$
 $Pr' \leftrightarrow \langle e, p \rangle$
 $Pr \leftrightarrow \cup: \pi \rightarrow \langle e, p \rangle$
 $VP \leftrightarrow \pi$

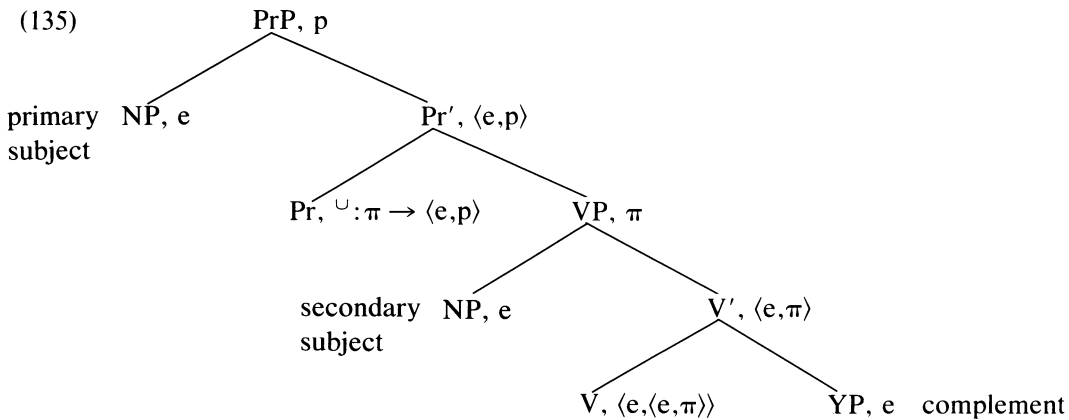
predication(\cup): $\langle \pi, \langle e, p \rangle \rangle$
 nominalization(\cap): $\langle \langle e, p \rangle, \pi \rangle$

$intr V \leftrightarrow \pi$
 $trans V \leftrightarrow \langle e, \pi \rangle$
 $ditrans V \leftrightarrow \langle e, \langle e, \pi \rangle \rangle$
 $pred NP, AP \leftrightarrow \pi$

Finally, putting the syntax proposed in this article together with the semantics discussed above, the syntactic structure of a transitive sentence such as *John will love Mary*, along with its translation in logical form and the corresponding type assignments, will be represented as in (133).

A ditransitive sentence such as *John will give a book to Mary will*, on the other hand, have the structure and type assignments shown in (134). More generally, then, propositions will universally have a uniform syntactic structure (and type assignments) of the form shown in (135).





If any relation is semantic, it is surely the predication relation. Almost without exception, model-theoretic accounts of predication have adopted the “Fregean” view that the act of predication consists of “saturating” or “completing” structures that are inherently “unsaturated” or “incomplete.” (But see Aczel 1980, Bealer 1982, Jubien 1985, for example, for an alternative, non-“Fregean” approach to predication.) At the same time, there appears to be strong semantic evidence (Chierchia 1984, 1985, 1989, Chierchia and Turner 1988) that properties in natural language cannot simply be identified with propositional functions, but must be able to function as individuals, as well. If the arguments in this article are correct, then it turns out, quite remarkably, that the syntactically motivated structures required to support a structural theory of predication match up in a simple, “transparent” fashion with the types of entities and operations required in a richer logical language of the sort envisioned by Chierchia. Imagine that similar results could be achieved in other areas of syntax and semantics (see Bowers 1991, for arguments that this is in fact possible in the case of nominal structures). Though this would be remarkable, it would surely not be surprising. A priori, it seems quite unlikely that the structural representations required to represent the syntactic phenomena of natural language will turn out to be related in random and essentially unpredictable ways to the types and operations required to support an explicit semantics for natural language. Probably, everyone would assent to the assumption that an adequate semantic theory must be compositional. The requirement of compositionality ensures that each syntactic rule or substructure will be matched by a corresponding semantic rule or type. However, as Chierchia and Turner (1988:277) note, “everything else being equal, one would prefer not to have to specify for any given grammar, the pairing of syntactic rules with the corresponding semantic one, on a case-by-case basis. One would like such a pairing to follow from general principles.”

The considerations put forward in this article strongly suggest that the pairing of syntactic and semantic rules is in fact quite general and universal. I have argued, in particular, that the basic structural relations in sentences are universally specifiable by

applying an extremely restricted version of X-bar theory to a small number of lexical and functional categories. The pairing of syntactic categories with semantic types and of syntactic relations with semantic operations is, I claim, fixed within very narrow limits by the principles of Universal Grammar. Specifically, I have tried to show that the category 'Pr', whose translation is simply ' \cup ', along with its phrasal projections, provides a uniform account of the syntax and semantics of every kind of predication relation encountered in natural language. Given this category and its translation in logical form, the structure and interpretation of the phrasal categories it can project are completely determined by the principles of X-bar theory in the syntax and by the principle of functional application in the semantics.

Similarly, I have shown that expressions of the category VP, uniformly paired with properties (expressions of type π), have an asymmetrical structure, mirrored in the corresponding logical representations, which is precisely parallel to the structure of PrP. In particular, the so-called direct object asymmetrically c-commands the complements of the verb. Semantically, the V' constituent is an unsaturated expression (as is Pr') that yields a property expression when applied to the direct object constituent. I have tried to show that this remarkable parallelism between the internal structures of PrP and VP is empirically supported by a wide range of syntactic and semantic considerations.

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