

Adjunct Predicates, Small Clauses, and a Theory of Control

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1. Introduction

This paper presents an analysis of the two types of adjunct predicates that are italicized in (1). (Through the discussion in this paper, subscript indices are used to stand for the modification relation holding between an adjunct predicate and its antecedent (or host NP), except for cases with a notice.)

- (1) a. John_i left the room *happy*_i.
b. John ate the meat_i *raw*_i.

Following Iwasawa's (1985) classification of adjunct predicates, we refer to these adjunct predicates as temporal predicates: predicates like (1a) are labeled Subject-oriented Temporal Predicates (hereafter, STPs) and ones like (1b) Object-oriented Temporal Predicates (hereafter, OTPs).¹

It is a well-known fact that example (1a) is not synonymous with the sentence with a manner adverb in (2):

- (2) John left the room happily.

(1a) entails that the individual in question was in fact happy; (2) does not. Thus the difference in acceptability between the following sentences follows:

- (3) a. *John left the room happy, but he wasn't really happy.
b. John left the room happily, but he wasn't really happy.

This fact means that there does exist semantic dependency between an adjunct predicate and its antecedent.² At the same time, these predicates count as adjuncts, like adverbs, in that they are not selected by the main predicates (*leave* and *eat* in (1)) and do not select any elements in the main clauses. That is, these sorts of predicates have adverbialhood as well as predicative force. The goal of this paper is to identify the source of this duplicity which the adjunct predicates have.

Our main concern is with the syntactic and semantic analysis of STPs and OTPs within clauses and nominal expressions: to solve the question of where the predicates occur and the question of how to analyze the semantic dependency that holds between those predicates and their antecedents. Our conclusion is that an STP and an OTP are generated in the maximal projections of different heads. Furthermore, I will argue that the adjunct predicates in question are not directly predicated of their host NPs; rather, they are in a predication relation with PRO, which is, in turn, controlled by the host NPs of the predicates. In other words, we will attribute the predication relation in

question to control of PRO. In addition, we will see the assumption that the small clause containing an adjunct predicate functions as an adverbial has several consequences for the analysis of the adjunct predicates.

This paper is organized as follows. Section 2 will be devoted to discussing the syntactic positions of STPs and OTPs in accordance with X-bar theory. In doing so, we will introduce the theory of clause architecture proposed in Bowers (1993). In section 3, we will tackle the problem of how to explain semantic dependency between adjunct predicates and their antecedents. In the latter half of that section, we will discuss problematic cases to the explanation presented in section 3.2 and seek for a solution. Some concluding remarks are made in section 4.

2. Structural Positions of STPs and OTPs

2.1. Preliminary Remarks

In this section we discuss the structural positions of STPs and OTPs. Many linguists argue that both STPs and OTPs occur within VP (see McNulty (1988), Roberts (1988), Tsuzuki (1988,1989), among others). More specifically, STPs and OTPs are analyzed as adjoined to VP and V', respectively. Their arguments are mainly based on the VP-constituency tests proposed in Andrews (1982). Let us begin by reviewing some of the previous discussions briefly.

(4) VP-Preposing

- a. We expected John_i to visit us sober_i, and [_{VP} visit us sober_i] he_i did. (STP)
- b. *We expected John_i to visit us sober_i, and [_{VP} visit us] he_i did sober_i. (STP)
- c. John said that he would eat the meat_i raw_i and in fact [_{VP} eat the meat_i raw_i] he did. (OTP)
- d. *John said that he would eat the meat_i raw_i and in fact [_{VP} eat the meat_i] he did raw_i. (OTP)

(Tsuzuki (1989: 35) with slight modification)

(5) *Though*-Movement

- a. [_{VP} Leave the room happy_i] though John_i may . (STP)
- b. *[_{VP} Leave the room] though John may happy_i. (STP)
- c. [_{VP} Drink the beer_i flat_i] though John may . (OTP)
- d. *[_{VP} Drink the beer_i] though John may flat_i. (OTP)

(Roberts (1988: 705))

(6) Pseudo-cleft

- a. What John_i did was [_{VP} leave the room happy_i]. (STP)
 b. *What John_i did happy_i was [_{VP} leave the room]. (STP)
 c. What John did was [_{VP} drink the beer_i flat_i]. (OTP)
 d. *What John did flat_i was [_{VP} drink the beer_i]. (OTF)

(Roberts (1988: 705))

The domain to which all the syntactic operations exemplified in (4) - (6) apply is taken to be a constituent VP. Notice that in all of these examples, both STPs and OTPs have to undergo the syntactic operations with VP. Thus, it may be concluded that STP and OTPs are generated within VP.

In addition, the relative word order of STPs and OTPs and the *do-so* substitution test reveal more precise structural positions of STPs and OTPs.

- (7) a. John_i ate the meat_j raw_j drunk_i. (OTP-STP)
 b. *John_i ate the meat_j drunk_i raw_j. (STP-OTP)
 (8) a. John_i may visit us sober_i, or he_i may do so drunk_i. (STP)
 b. *John often eats apples_i whole_i, but I often do so sliced_i. (OTP)

(7a,b) show that OTPs occur closer to V than STPs. In addition, according to Jackendoff (1977), the minimal domain to which the *do-so* substitution test applies is V'. Therefore, the ungrammaticality of (8b) appears to indicate that OTPs are in V'. On the other hand, the grammaticality of (8a) appears to constitute evidence for the assumption that STPs are adjoined to VP.

The conclusion that both STPs and OTPs are generated within VP, however, raises some difficulty with regard to cooccurrence with VP-adverbs, which leads us to revise the analysis. Consider the following:

- | | | | | | |
|------|-----------|-----|---------------------|-----|-------|
| (9) | John will | ___ | eat the meat raw | ___ | (OTP) |
| | perfectly | | * | ?? | |
| | quickly | | OK | OK | |
| (10) | John had | ___ | sung the song drunk | ___ | (STP) |
| | perfectly | | * | * | |
| | quickly | | ?? | ?? | |

The generalization is that OTPs can cooccur with *quickly*-type adverbs but not with *perfectly*-type adverbs in the postverbal position, while STPs can cooccur with neither of them.

In order to explain the distributional pattern shown in (9) and (10), it might be sufficient to assume that: (a) *quickly*-type adverbs, like STPs, are adjoined to VP and

perfectly-type adverbs, like OTPs, are adjoined to V', and (b) multiple adjunction to the same node is prohibited. The assumption (a), however, faces a problem under a licensing mechanism for adverbials. According to Travis (1989), an adverb is licensed by an appropriate head, and they must be in an one-to-one relation. If the assumption (a) were correct, under Travis' licensing mechanism for adverbs, the two types of adverbs should be licensed the same head, namely V, and it would be predicted that they cannot cooccur. This prediction cannot be borne out, however, as shown by (11).

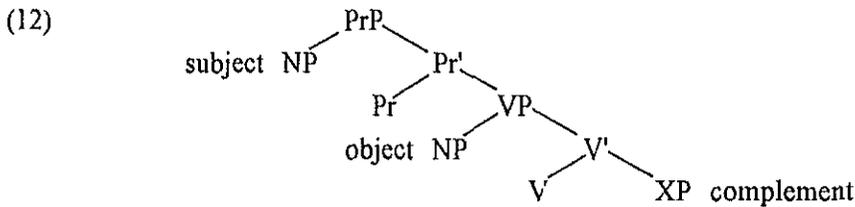
- (11) a. John quickly learned French perfectly.
 b. John learned French perfectly (very) quickly.

(Bowers (1993: 606))

The acceptability of (11a,b) suggests that the two types of adverbs should be licensed by distinct heads. This, in turn, requires an alternative explanation of the facts given in (9) and (10). In the next subsection, we reconsider the structural position of STPs and OTPs in the framework of Bowers (1993).

2.2. Bowers' Predication Phrase and the Structural Position of STPs and OTPs

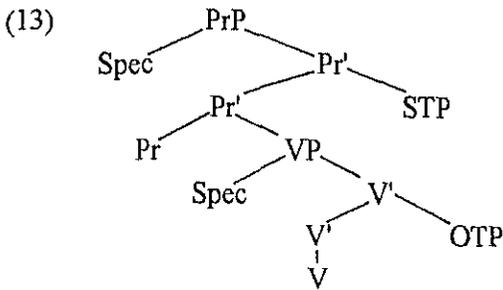
Bowers (1993) argues for the existence of a functional category that is the complement of INFL (I) or TENSE (T)³ and takes VP as its complement: Predication Phrase (PrP). He further argues, adopting the insight of the so-called Internal Subject Hypothesis, that subjects of clauses (primary subjects) are base-generated in [SPEC, PrP], and objects (secondary subject in his term) are in [SPEC, VP], and other arguments such as Dative are in complement position of V. Schematically, his proposal is represented as in (12).



(Bowers (1993: 601) with slight modifications)

In Bowers' theory, a verb, generated in V, assigns a relevant θ -role and Accusative Case to an object, then obligatorily moves into Pr by head-to-head movement in order to assign a relevant θ -role to subjects. As for subjects, they move into [SPEC, IP] for a Case theoretic reason.^{4,5}

Now, we are at the point of presenting our structural analysis of the adjunct predicates in question. Adopting Bowers' PrP hypothesis, we assume that STPs and OTPs are adjoined to Pr' and V', respectively. Schematically, this idea is represented as in (13).⁶



We can provide an account for the examples given in (4)-(8) in the following way: from the assumption about the structural positions of STPs and OTPs represented in (13), the fact that the latter precedes the former, as shown in (7), naturally follows; by assuming that the so-called VP-constituency tests exemplified in (4)-(6), in fact, apply to PrP, not to VP, it is predicted correctly that STPs and OTPs undergo these operations with PrP-constituents; by assuming that the *do-so* substitution test in (8) applies to VP, it is predicted correctly that STPs are outside the (minimal) domain to which the operation applies, while OTPs must be within the domain.

2.3. Empirical Arguments

Supporting evidence that Bowers presents for his analysis includes, among others, distributional properties of two types of manner adverbs and some conjoined structures, which are especially relevant to our purpose. In this subsection, we will take them up in turn so as to illustrate some consequences of our analysis of STPs and OTPs based on Bowers' PrP hypothesis.

2.3.1. Licensing of Adverbs and Adjunct Predicates

First, we discuss the issue of licensing of adverbs. According to Bowers (1993), some kind of manner adverb is permitted to occur only in postverbal position, while others can occur in either preverbal or postverbal positions in a sentence. The former are exemplified by *perfectly*, *poorly* and *beautifully*, and the latter are by *quickly*, *completely* and *confidently*.⁷ This is illustrated by the sentences given below.

(14) a. John learned French perfectly.

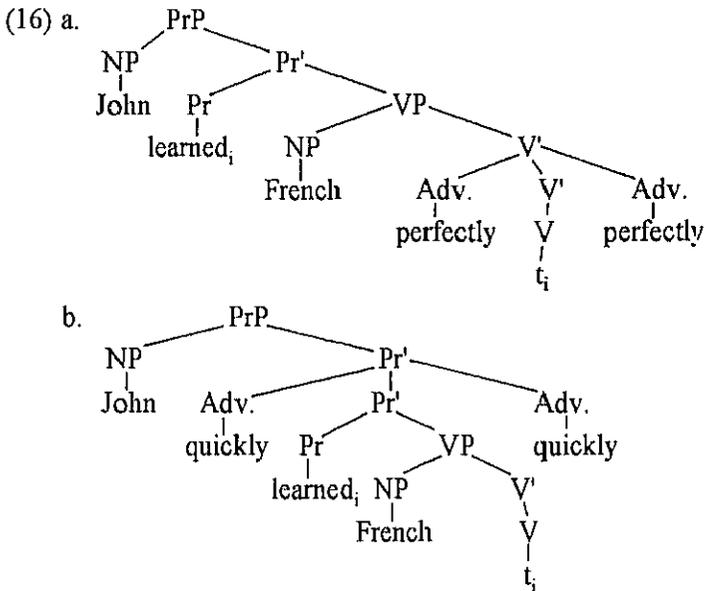
b. *John perfectly learned French.

(15) a. John learned French quickly.

b. John quickly learned French.

Bowers assumes a stricter licensing mechanism for adverbs than the one in Travis (1989): adverbs are licensed by appropriate heads and they are in an one-to-one relation. Specifically, he assumes that the adverbs that occur only in postverbal position, like *perfectly*, are licensed by V, and those which can occur in either preverbal or post-

verbal position are licensed by Pr. The distributional patterns shown in (14) and (15) are represented as in (16a) and (16b), respectively.



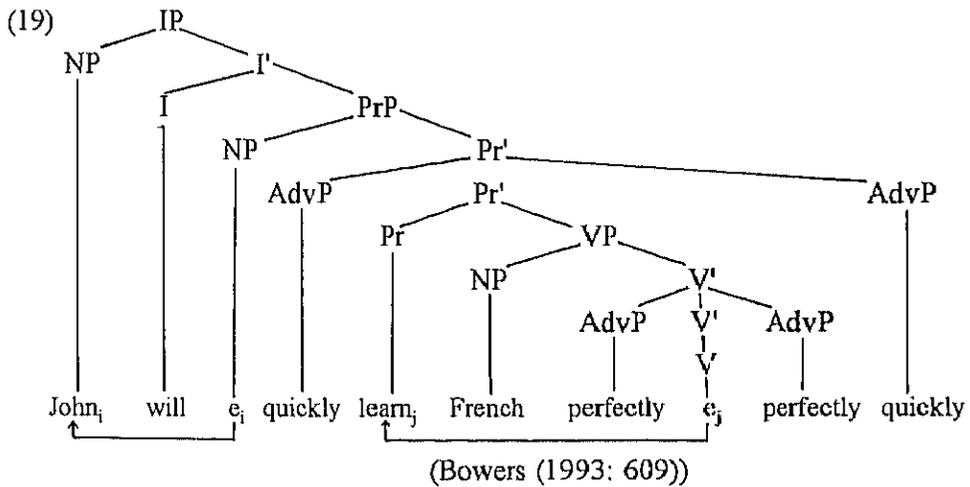
His analysis correctly predicts the distributional patterns given in (11), and the patterns given in (17)-(18) as well:

- (17) a. John quickly learned French perfectly.
 b. John learned French perfectly (very) quickly.
 (18) a. *John perfectly learned French quickly.
 b. *John learned French quickly perfectly.

(Bowers (1993: 606f))

The fact that *perfectly*-type adverbs can occur only in postverbal position is explained in terms of V-movement into Pr: V moves over such adverbs and always precedes them. In contrast, *quickly*-type adverbs are adjoined either to the right or to the left of Pr', and V never crosses such adverbs (at S-structure) in English, hence they can occur either to the right or to the left of V. This is represented as in (19) in the next page.

Now, we can account for the problems in (9)-(10) along the line of Bowers (1993). We have assumed that STPs and OTPs are adjoined to Pr' and V', respectively. Let us make a further assumption that the adjunct predicates in question are licensed in the parallel way to the adverbs discussed above: STPs, like *quickly*-type adverbs, are licensed by Pr, and OTPs, like *perfectly*-type adverbs, by V.⁸ Behind this assumption is the idea that STPs and OTPs count as adverbials, like manner adverbs, and they



must be licensed by a category with a semantic content which is compatible with their semantic function (cf. Zubizarreta (1982), Travis (1988), and so on). To put it differently, we are treating STPs as PrP-modifiers and OTPs as VP-modifiers. Given these ideas and the assumption of the one-to-one relation between an adverbial and its licenser, it is not surprising that OTPs cannot cooccur with *perfectly*-type adverbs nor can STPs with *quickly*-type adverbs: an OTP cannot occur with a *perfectly*-type adverb, because their licenser V cannot license both of them at a time; in the case of an STP and a *quickly*-type adverb, their licenser Pr cannot license both of them at a time.

At this point, it may be natural to ask why STPs cannot cooccur with *perfectly*-type adverbs as well. Our explanation is as follows: STPs have to be licensed by Pr and *perfectly*-type adverbs by V, so that the former can never precede the latter in postverbal position. In addition, when a *perfectly*-type adverb immediately precedes an STP, as in examples like *John had sung the song perfectly drunk*, the adverb is forced to modify STPs, so we cannot obtain the intended reading.

In the above discussion, we have said simply that the adjunct predicates in question are licensed as adverbials. As for this point, it should be noted that some linguists, for example, Maruta (1995) and O'Grady (1982), regard the adjunct predicates as (true) adverbs, and their arguments may be to the point to some extent. Contrary to them, however, I argue that what functions as an adverbial is not the adjunct predicate itself but a small clause which consists of the adjunct predicate and a PRO, and that the predicate functions as a predicate of its PRO subject (see the discussion in section 3 and also in note 2). Notice that the analysis presented here implies that

we regard the adjunct predicates as similar to participial constructions in that both of them depend on the main clauses for the interpretation of the subjects (and, probably, tense as well) (cf. Jackendoff (1990a)). (For the sake of convenience, however, we call the small clause containing the adjunct predicate simply an STP and an OTP throughout the following discussions.)

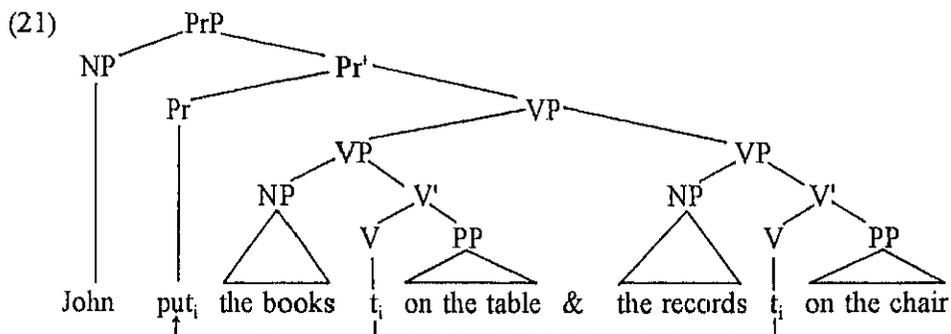
2.3.2. *Coordinate Structures*

We discuss briefly another piece of supporting evidence for Bowers' PrP hypothesis, which is of importance for our topic as well. The following sentences contain the structure that is called "nonconstituent coordination" in Larson (1988, 1990):

- (20) a. Mary considers [John a fool] and [Bill a wimp].
 b. Bill regards [professors as strange] and [politicians as creepy].
 c. Sue will put [the books on the table] and [records on the chair].

(Bowers (1993: 602))

Under the standard analysis of VP, Bowers claims, the structures of these sentences are difficult to explain, because the conjoined elements in square brackets in each example above cannot be regarded as a constituent. In Bowers analysis, in contrast, they are straightforwardly analyzed as instances of the across-the-board (ATB) extraction of V from the conjoined VPs. For example, the structure for (20a) should be represented as in (21).⁹

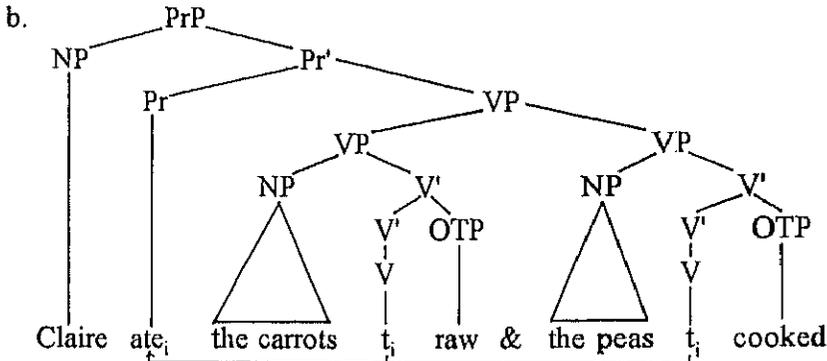


Like (21), the bracketed elements in the other examples in (20) are analyzed as constituents of VPs, and the VPs are conjoined.

Bowers' analysis of (20), combined with the assumption that OTPs are adjoined to V', has a consequence for the analysis of a similar structure containing OTPs. The example in (22a), which is cited from Travis (1989), contains the conjoined constituents consisting of an object and an OTP. Here again, we can regard it as an illustration of

ATB extraction in the parallel way to (20), as shown in (22b).

(22) a. Claire ate the carrots raw and the peas cooked.



From these observations, we may conclude that the analysis proposed so far is well-motivated. Furthermore, as we will see in the next subsection, our analysis has other consequences for the distributional difference between STPs and OTPs with regard to the nominalization.

2.4. *Distributional Properties of STPs and of OTPs within NPs*

Rothstein (1983) observes an interesting fact with regard to the adjunct predicates with nominals: OTPs are fully allowed to occur with derived nominals, while STPs are only marginally allowed, as shown in (23).¹⁰

(23) a. the delivery of the parcel_i unwrapped_i.

b. ?John's_i performance of the song drunk_i.

Taking nominal gerunds into consideration, we obtain an interesting descriptive generalization: OTPs can occur with both derived nominals and nominal gerunds, while STPs are fully allowed to occur with nominal gerunds but marginally allowed to occur with derived nominals. This is illustrated by the following examples:

(24) a. John's delivering the apples_i ripe_i

b. John's delivery of the apples_i ripe_i

(25) a. John's_i performing the song sober_i

b. ?John's_i performance of the song sober_i

In this subsection, we seek to discover an explanation of the matter. In the course of discussion, we will see that the analysis of STPs and OTPs proposed in the previous subsection, interacting with Zucchi's (1993) observations about nominalization in English, provides an interesting account for the issue.

Let us begin by reviewing Zucchi's (1993) discussions. Zucchi argues that derived nominals denote event-like entities, while nominal gerunds denote propositional entities.

The following examples are some pieces of evidence that she presents:

- (26) a. the/a/that performance of the song
 b. the beautiful performance of the song
 c. *the performance of the song beautifully
- (27) a. *the/a/that performing the song
 b. *his beautiful performing the song
 c. his performing the song beautifully
- (28) a. John's performance of the song was slow/was sudden/took a long time
 b. *John's performing the song was slow/was sudden/ took a long time
 (Zucchi (1993: 21f))

The facts given in (26)-(27) are pointed out in Lees (1960): derived nominals allow prenominal adjectives and articles, but not adverbs; nominal gerunds, on the other hand, allow adverbs, but not articles and prenominal adjectives. As for (28), Vendler (1967) observes that, while derived nominals may occur with predicates such as *is slow*, *is sudden*, and *takes a long time*, nominal gerunds cannot occur with these predicates and, in this respect, are parallel to *that*-clauses and *fact* NPs.

- (29) a. *that John performed the song was slow/was sudden/took a long time
 b. *the fact that John performed the song was slow/was sudden/took a long time

Following Vendler, Zucchi argues that the contrast shown in (28) is explained by assuming that derived nominals denote events, while nominal gerunds denote propositional entities. If we assume that predicates like *is slow*, *is sudden*, *takes a long time* semantically select events but not propositional entities, the contrast follows.

Zucchi's insight, interacting with our analysis based on Bowers' PrP hypothesis, plays an important role in interpreting the distributional difference between STPs and OTPs with regard to the two kinds of nominals. Remember that while OTPs may occur both with derived nominals and with nominal gerunds, STPs are fully allowed to occur with nominal gerunds but only marginally allowed to occur with derived nominals. We have already seen that it is a promising way to assume that STPs are licensed by Pr and have to be within PrP, whereas OTPs are licensed by V and have to be within VP. Let us assume that VP is a syntactic category which semantically denotes *eventuality* in Bach's (1986) terms, and, following Bowers (1993), that PrP is the syntactic category which corresponds to proposition in semantics (see Bowers (1993: 650)). If we postulate a close correspondence between syntax and semantics, it seems to be plausible to

identify the syntactic licensing conditions on STPs and OTPs with reflections of their semantic functions: an STP is a proposition-modifier and must select propositional entities as its modification domain, while an OTP is an event-modifier and must select an event-like entity as its modification domain (for a similar approach to semantics of the adjunct predicates in question, see Maruta (1995)). Given these assumptions, the degraded grammaticality of (23b) and (25b) is explained from the viewpoint of the conflict between the semantic entity that STPs select as their modification domain and the semantic entity that derived nominals denote. On the other hand, if we assume that OTPs are licensed by V because of their property to modify eventuality denoted by VP, then it will be natural that they can occur with derived nominals.¹¹

This analysis raises a question: why is an OTP allowed to occur in a nominal gerund? In other words, why is it that an OTP which modifies an event-like entity does not semantically conflict with a propositional entity which a nominal gerund denotes? At this point, I do not have much to say about this question. I simply stipulate, without arguments, that a propositional entity contains an event, a process, or a state (*eventualities* in Bach's (1986) terms) as a core part of its internal semantic structure, and that OTPs with nominal gerunds modify that (internal) event-like entities. In other words, in a case such as (24a), an event-like entity and an OTP modifying it are both subparts of a proposition denoted by a nominal gerund. On the other hand, if we suppose that such a predicate as *is slow* in (28), for example, selects a propositional entity as a whole, and cannot correspond to the internal eventuality of the proposition, then it follows that such a predicate cannot cooccur with a nominal gerund denoting a propositional entity. I have no strong evidence that this must be so, however, and I leave this question pending.

In this section, we have seen that the structural positions of the adjunct predicates in question are appropriately analyzed under Bowers' PrP hypothesis, and that our analysis provides a natural explanation for the distributional properties within NPs which STPs and OTPs exhibit. Another major problem concerning the adjunct predicates, namely the determination of their antecedents, is considered in the next section.

3. Adjunct-Predication Relation

The relation between the adjunct predicate in question and its antecedent has been of much controversy in the literature. Many researches, such as Williams (1980), Rothstein (1985) and McNulty (1988) to name a few, try to define the relation in terms

of some predication rules based on a certain syntactic notion such as c-command or m-command. For example, Williams (1980), in order to cover predication in general and obligatory control, proposes a predication rule and a c-command restriction that are summarized as follows:¹²

- (30) a. Predication Rule: Coindex NP and predicate X.
 b. C-command Restriction on Predication: If NP and X are coindexed, NP must c-command and c-subjacent to X or a variable bound to X.

The predication-theoretic approaches advocated by Williams (1980) and other researchers predict that: (a) the subject of a predicate is represented explicitly in phrase structure, and (b) the predicate and its subject must be in a particular structural relation. In this section, however, pointing out difficulty of the predication-theoretic approach with both (a) and (b), we will show some advantages of a clausal analysis of the adjunct predicates.

3.1. *A Small Clause Analysis*

We propose that an adjunct predicate is predicated of PRO, which is controlled by the host NP which is associated with the predicate, and that the predicate and the PRO subject form a small clause (SC). This means that the relation holding between the predicate and its antecedent should not be regarded as a direct predication relation but be treated as control of PRO. This kind of analysis, called a SC analysis, assigns the sentences in (1) the following structures:

- (31) a. John_i left that room [_{SC} PRO_i angry_i].
 b. John ate the meat_i [_{SC} PRO_i raw_i].

This line of approach, which is defended by Chomsky (1981), Stowell (1981), and Hornstein & Lightfoot (1987), conflicts with the predication-theoretic analysis mentioned above, which directly relate the adjunct predicates to their antecedents by a predication rule. Let us see some advantages of the SC analysis over the predication-theoretic analysis.

First, it is noteworthy that the SC analysis makes possible a straightforward explanation of the agreement phenomena between adjunct predicates and their host NPs in some languages. In Spanish and Portuguese, adjunct predicates explicitly agree with their host NPs in gender and number, just like main predicates do with subjects in tensed clause. Let us take two examples in Spanish pointed out by McNulty (1988).

- (32) a. Juan_i se marchó [_{SC} PRO_i enfadado/*enfadada/*enfadados/
left the room m.s. f.s. m.pl.
nude
*enfadadas_i].
f.pl.
- b. Juan comió la carne; [_{SC} PRO_i cruda/*crudo/*crudos/ *crudas_i].
ate the meat f.s. m.s. m.pl. f.pl.
raw

(McNulty (1988: 99) with modifications)

According to the current syntax, overt agreement entails involvement of the functional category, Agr. The SC approach seems to be appropriate for these agreement phenomena of adjunct predicates with their host NPs, because the phenomena are naturally identified with the agreement between verbs and subjects in tensed clauses (see, for example, the study of small clause in French and English by Kikuchi & Takahashi (1991)). In Chomsky (1991), the agreement phenomenon between a subject and a verb is analyzed as Spec-Head Agreement via Agr: it establishes between the subject that has appeared in [SPEC, AgrP] and the verb adjoined to Agr. If we assume the SC analysis and regard a small clause as AgrP (at least in Spanish and Portuguese), this explanation applies naturally to the agreement phenomena illustrated in (32): the adjunct predicate has an agreement form with the antecedent through its agreeing with the PRO in [SPEC, AgrP]: the PRO subject which has been generated in [SPEC, PrP] moves to [SPEC, AgrP], the adjunct predicate generated in Pr is adjoined to Agr, hence the Spec-Head Agreement between them. (As noted earlier, we continue to use the terms of STPs and OTPs to indicate the small clauses throughout the following discussions.)

In contrast, under the predication-theoretic approach, it is difficult if not impossible to provide some syntactic account for the agreement phenomena exemplified in (32). In fact, McNulty (1988) simply treats them as PF phenomena.

Second, to reduce the relation between adjunct predicates and their host NPs to the control of PRO subjects by the NPs is useful for explaining the parallelism found among the examples like (33).

- (33) a. The game was played [PRO to prove a point].
b. The game was played [PRO wearing no shoes].
c. The game was played [PRO drunk/nude/angry].

Roeper (1987) points out that implicit arguments may control PRO in the rationale and gerundive clauses as in (33a,b). In (33c), an implicit argument, the player(s) of *the game*, is construed as the antecedent of the adjunct predicates. Whatever a correct

mechanism for control by implicit arguments is, it seems to be relatively unproblematic to posit PRO in rationale and gerundive clauses. In the same vein, it seems to be tenable to assume that the adjunct predicates take PRO subjects. Roeper claims that the fact that adjunct predicates allow control by implicit arguments favors the view that adjunct predicates, rationale clauses, and gerundive clauses all share the same property: involvement of PRO. As pointed out by Okada (1992a), the fact that an implicit argument can be taken to be the antecedent of an adjunct predicate is at odds with the predication-theoretic approach: under this approach, the antecedent of an adjunct predicate is required to be expressed in phrase structure.¹³

Third, a predication-theoretic analysis cannot give any straightforward explanation to the examples in (34) and (35b).

- (34) a. John stared [_{PP} at Mary_i] nude_i.
 b. ?Mary was watched [_{PP} by Bill_i] naked_i.
 (35) ?It's snowing thick.
 (cf. Snow_i is falling thick_i.)

Each of *Mary* in (34a) and *Bill* in (34b) is embedded in PP and can neither c-command nor m-command its predicate. In (35), the adjunct predicate is allowed, though somewhat degraded, and it does not have any explicit antecedents. These examples pose a problem to the predication-theoretic analysis which directly associates an adjunct predicate with its host NP in terms of some strict syntactic notion.

In this subsection, we have seen that a SC analysis for the adjunct predicates in question has some advantages over a predication theoretic analysis.

3.2. Determination of Controller

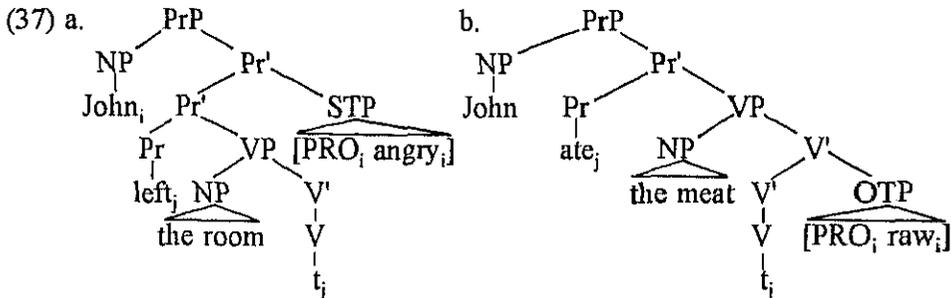
It should be noticed here that (34a,b) and (35) in the previous subsection can be problematic also to the SC analysis: if we adopt the prevailing assumption of the c-commanding controller, no explanation will be obtained for the adjunct predication relation in these examples, and we have to seek for some alternative.¹⁴ Among several analyses of control, there are two approaches which seem to be helpful. One is that in which the theory of control is assumed to belong to the semantic component, as argued for by Jackendoff (1990a), and the other is that argued for by Williams (1985) in which control is taken to apply directly to θ -roles, rather than to structural positions. When we integrate the two approaches into our study successfully, we will obtain an account for these problematic cases, as well as for the other examples already observed. We discuss this issue in the rest of this section.

3.2.1. C-commanding Controller

The notion of c-command has been used to treat a number of phenomena including control. Postulating PRO subjects in adjunct predicate constructions, Bowers (1993) suggests that PRO be controlled by the closest c-commanding NP. In our approach each of (36a) and (36b) is assigned a structure as in (37a) and (37b), respectively.

(36) a. John left the room angry.

b. John ate the meat raw.



In (37a) the subject *John* is the c-commanding NP closest to PRO, so it is the appropriate controller; in (37b) the object *the meat* is the closest c-commanding NP, so it is qualified as the controller.

Apparently, our assumption based on Bowers' PrP Hypothesis about the structural positions of STPs and OTPs has two advantages over previous studies. First, in some case, our analysis can make it simpler to associate adjunct predicates with their antecedents: in Bowers' framework, direct (accusative) objects are generated in the Spec of VP and able to c-command PRO subject of corresponding adjunct predicates. Note that if we adopted the standard VP structure and assumed that OTPs are adjoined to V', the closest c-commanding NPs to the predicates would be the subject NPs.

Second, as pointed out by Bowers himself, we can explain in simple structural terms why Goal and Source arguments cannot be antecedents of OTPs.

(38) John gave the dog_i Mary_j dead_{v'}_j.

This fact has been observed in Williams (1980) and Rothstein (1983). Recall that, in Bowers' framework, Goal and Source arguments are generated in the complement position of V, as shown in (12) in 2.2. As a result, they cannot c-command OTPs, or, more precisely, the PRO subjects of OTPs, from there, so they are inappropriate for the antecedents.

As we have observed in 3.1, however, there exist some cases to which we cannot give any explanation in purely syntactic terms. For example, how should we treat the case in which the antecedent NP is embedded within PP? One of such cases has been

given in (34a), which we repeat here as (38) with a slight modification.¹⁵

(39) John stared [_{pp} at Mary_i] [PRO nude_i].

In (39) *Mary* cannot c-command the PRO subject of the adjunct predicate, so it would not be qualified as the controller, contrary to the fact.

One might claim, however, that the NP is not embedded within PP, in view of the fact that (39) can be (pseudo-)passivized as shown in (40):

(40) Mary_i was stared at (by Bill) nude_i.

In Bowers' approach A-movement operations such as passivisation are restricted to Spec-to-Spec movement, namely from [SPEC, VP] to [SPEC, PrP]. The object of the preposition *Mary* would have been generated in [SPEC, VP]. Then, where would the preposition *at* be generated? An option available might be to appeal to some obligatory operation by which the sequence of V+P is reanalyzed as a single term which is in turn generated in V.¹⁶ Although the operation of Reanalysis has often been presumed without specification, the nature and the validity of the operation seem to be still uncertain. For example, what happens in the case where an adverb is inserted between V and P?

(41) John stared raptly at Mary.

To what extent is it plausible to stipulate that Reanalysis obligatorily applies in (37), but not in (40)? Baker (1989) challenges the Reanalysis approach, pointing out the fact that a number of speakers find such examples as in (42) moderately acceptable:

- (42) a. John was voted eagerly for by most conservatives.
b. Bill was talked bitterly to.

(Baker (1989: 42))

The fact that these examples are acceptable is problematic to the Reanalysis approach: in each of them reanalysis would not apply because an adverb intervenes between V and P, and as a result, we predict that passivization would not take place, contrary to the fact.

More problematic is the example given in (35), repeated as (43).

(43) ?It's snowing [PRO thick].

If we search for the element that can be an implicit controller in the case of (43), we cannot find it anywhere but in the lexical or conceptual information of the verb *snow*.

The observations made in this subsection indicate that purely syntactic approach to the control problem is not a reliable one, and that we have to seek for some alternative.

3.2.2. A Semantic Approach to Control Problem

Farkas (1988), Jones (1988), and Jackendoff (1990a) among others, take a semantic approach to the control problem, and their analyses seem to be very promising. Although the comprehensive review of their arguments is beyond my ken, let us apply the insight shared by them to our topic.

The fundamental insight of their arguments may be summarized as in (44):

- (44) The controller of PRO is the participant who is “most relevant” to the situation denoted by an infinitive clause, and that it is determined based on semantic and pragmatic information given from the infinitive clause and the main predicate.

The following examples, which are cited from Jackendoff (1990a: 68), are very illustrative (in the following example, coindexation is used to stand for the coreferential relation between the elements):

- (45) a. John_i gave Sue_j a promise PRO_i to leave.
 b. John_i got from Sue_j a promise PRO_j to leave.

As Jackendoff argues, there is no apparent syntactic condition that can determine the proper controller of PRO, and the examples indicate that it is irrelevant whether the controller can c-command PRO or not.

However, the sentences differ in a semantic and pragmatic respect. In these cases, the participant who is most relevant to the situation denoted by the infinitive clause *to leave*, is the issuer (or the Source argument) of a promise, and he/she undertakes an obligation to perform the action described by the infinitive clause. Jackendoff argues that part of the lexical meaning of *promise*, interacting with the θ -role assignment property of *give* and *get*, makes this determination procedure of the controller available.

In addition, it has been widely observed that passivisation in the infinitive clause of *promise* affects control relations. Consider:

- (46) a. John promised Mary to be allowed to leave.
 b. John promised Mary to leave.

In (46a), the person *to be allowed to leave* is most naturally taken to be *Mary*, not *John*. When we compare (46a) with (46b), this fact is problematic to any purely syntactic approach: the structural relations does not seem to be different between (46a) and (46b), and here again a purely syntactic approach to the control problem fails to provide any principled account. Now, we can see that the control problem cannot be solved until we take into consideration lexical meanings and our pragmatic knowledge of the world.

It seems that a similar account applies to the case of adjunct predication. That is, it may be reasonable to assume that the antecedent of an adjunct predicate is the most relevant participant for the situation denoted by the small clause with the predicates. Let us consider some examples.

- (47) a. John ate the meat raw.
- b. John met Mary angry.
- c. John stared at Mary nude.
- d. ?It's snowing thick.

In (47a), the antecedent for *raw* is uniquely determined, namely *the meat*. This is because only *the meat* is relevant to the situation in which something is raw. On the other hand, in (47b) the antecedent of *angry* can be either *John* or *Mary*, because both of them can be regarded as most relevant to the situation in which someone is angry. In (47c), however, the antecedent of *nude* is most naturally construed with *Mary* even if either *John* or *Mary* can be equally considered to be most relevant to the situation in which someone is nude. This might appear to be a problem. However, when we reflect on the meaning of the main predicate *stare at*, it will not be surprising. To *stare at* someone/something implies that the object that is stared at has some property or cause which attract someone's eyes, so the participant who is taken to be most relevant to the situation denoted by the SC containing the adjunct predicate is *Mary*, who arrests John's eyes. In (47d), only the substance of snow, which is a part of the meaning of the verb *snow*, is most relevant to the situation.

3.3. Problematic Cases and a Modification

The explanation developed in 3.2. is not, in fact, completely correct, in that there is a problem that it cannot deal with appropriately. So we have to modify our explanation.

3.3.1. Control in Derived Nominals

Safir (1987) points out interesting examples in which an implicit argument of a derived nominal may control an adjunct predicate, as illustrated in (48). (The judgement of acceptability is due to Safir and my informant judged (48) as slightly degraded.).

- (48) Discussion of these issues *stoned* rarely produces satisfactory results. (Safir (1987: 582))

It is still controversial whether an implicit external argument that a nominal head takes should be represented syntactically or not. When we take the affirmative, (48) is assigned such a representation as in (49):

(49) [_{NP}PRO_i discussion of the problem [PRO_i stoned_i]] rarely produces ...
The PRO of *discussion* controls the PRO subject of the adjunct predicate, *stoned*.

However, citing an example like (50) from Williams (1985), Safir claims that implicit arguments in nominals are not PRO.

(50) Yesterday's discussion of the issues stoned didn't clarify matters.
Under the common analysis of NP, there is nowhere to put the PRO in the NP which should control the PRO subject in the SC.¹⁷ Safir's analysis is similar to that of Williams (1985), in which implicit arguments of nominals are treated as a lexical property of the nominal heads.

According to the analysis developed in the earlier sections, it does not matter whether to posit PRO or not: the controller of the PRO subject of *stoned* is the participant in the discussion who is most relevant to the situation denoted by *nude*.

There exist problematic examples to the analysis, however. Consider the following:

- (51) a. *Bill's_i treatment naked_i started a riot.
b. John's treatment of Bill_i naked_i started a riot.

Under the analysis presented in 3.2.2, *Bill* in (51a) could be taken as the antecedent of the adjunct predicate, because in the expression *Bill's treatment*, the theme interpretation of *Bill* is the most preferred reading and *Bill* would be the participant in the discussion who is most relevant to the situation denoted by *nude*.

Safir (1987) points out, however, that (51a) is not construed as referring to the treatment that Bill received while he was naked, whereas (51b) receives such an interpretation, in which *Bill* is construed as the antecedent of the adjunct predicate. This difference in interpretation between (51a) and (51b) leads Safir to the proposal of the following descriptive generalization:¹⁸

- (52) Only when an internal argument of a nominal head (*of NP*) is represented, an external argument syntactically active and can control the adjunct predicate.

To solve this problem, we make some modifications to our analysis, integrating the insight of Williams (1985) that control applies to θ -roles in argument structures, rather than to syntactic positions. This is the topic in the next subsection.

3.3.2. Syntactically Active Arguments and Inert Participants

Williams (1985), in order to treat the control found in nominals like (53), proposes the mechanism which he calls "argument association mechanism", though he has a negative view to apply this to the control found in clauses.

examination, while in (57b), where the complement is represented, the genitive NP can have an interpretation related to the argument structure of the head noun *examination*, being interpreted as the agent of the action.

Now, we return to our topic. Under the proposal in (56), the difference in the acceptability found in (50) receives a natural account. Our explanation goes as follows: in (51b), the genitive NP *John('s)* is a syntactically active (external) argument and can control the PRO subject of the adjunct predicate *naked*, because the relevant nominal *treatment* takes its complement (*of*) *Bill* and has its argument structure into which the (external) argument associated with *John* is projected. On the other hand, in (51a) the genitive NP *Bill('s)* is syntactically inert and cannot control the PRO subject of the adjunct predicate, because the relevant nominal does not have an argument structure; hence the ungrammaticality. A parallel account applies to the following examples:

- (58) a. *the boat's destruction to impress the general
 b. the destruction of the boat to impress the general

The fact that in (58b) the complement of the derived nominal *destruction* is realized suggests that the head noun has argument structure, and thus the (implicit) external argument listed there can act as the controller of the PRO in the rationale clause. In (58a), on the other hand, because of lack of the complement, the derived nominal has no argument structure which contains an appropriate argument which can act as the controller of the PRO, (though this explanation is different from that in Williams (1985)).

The modification made here does not affect the explanation for the examples discussed in 3.2, since every predicate involved in those examples has argument structure, which means that an proper argument for the controller of a PRO exists.

It is noteworthy that not all the understood arguments that a predicate takes are syntactically active: there do exist the cases in which an understood argument of a predicate cannot be construed as an antecedent for the adjunct predicate in question. The middle construction is an example of such cases. It is well known that there is an understood agent in the middle construction, but such an argument cannot be realized as *by*-phrase, as shown in the following:

- (59) This book reads easily (*by children).

In this respect, the middle construction stands in contrast to the passive sentence.

- (60) Mary was stared at (by John_i) open-mouthed_i.

These facts lead us to the conclusion that the middle verb lacks the agent position in its argument structure, rather than has a suppressed agent position as the passivized

independently.) Therefore, the middle construction does not allow an adjunct predicate, as exemplified in (61a), nor a rationale clause, as exemplified in (61b):

- (61) a. *This door opens easily sober.
 b. ?*This book reads frequently to get knowledge of physics.

Another kind of example relevant to the discussion here is the implicit complement discussed in Rizzi (1986). He observes that the understood object in Italian is syntactically active while the null object in English appears to be syntactically inert, as shown in (62):

- (62) a. *In general, that famous painter portraits _ dressed in white.
 b. *This leads _ [PRO to conclude what follows].
 (cf. This leads people [PRO to conclude what follows].

(Rizzi (1986: 503,505))

In Italian, the counterparts of the above examples are grammatical. The unacceptability of the examples in (62) suggests that each of the verbs, namely, *portrait* in (61a) and *lead* in (62b), is completely intransitive and lacks an internal argument in its argument structure. Therefore, the PRO subjects cannot find a controller anywhere.

In this section, we have seen that a small clause analysis is an appropriate approach to the adjunct predicates, and that what is responsible for the determination of the antecedent of the adjunct predicate is semantic/pragmatic information that we get from lexical items and syntactically active arguments projected into argument structure. That is, the controller of the PRO subject within the small clause containing the predicate is determined in the collaboration of semantics with syntax.

5. Concluding Remarks

In this paper, we have proposed to analyze the adjunct predicates called STPs and OTPs here as small clauses with a PRO subject, and have argued that the small clauses are licensed as adverbials in a parallel way to so-called VP adverbs. In addition, we have also seen that the semantic dependency that holds between an adjunct predicate and its antecedent is attributed to control, and that both semantic/pragmatic information of lexical items contained in the relevant construction and the idea of argument structure play a crucial role in determining the antecedent of an adjunct predicate.

A final remark is to be added with regard to a theoretical evaluation of our approach. The autonomy of syntax that has been widely accepted in the field of generative grammar would reject our proposal which combine (44) with (56). For it mixes up the concept of argument structure as a syntactically relevant level and the

theory of control which seems to belong to the semantic component. However, when we take the position argued for in Jackendoff (1990a) on the issue of the autonomy of syntax and the modularity of the components of grammar, the conclusion drawn here will sound more natural. In Jackendoff's framework, the syntactic component and the semantic component are both autonomous and they interact with each other. Given such a perspective on grammar, it seems to be tenable that argument structure belonging to the syntactic component cooperates with semantic and conceptual information of a lexical item in control.

Notes

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¹In Iwasawa (1985), another subclass of depictive predicate (conditional/causal depictive predicates) is discussed. The type of predicates is not discussed here, because of their distinct syntactic and semantic properties from the adjunct predicates in question. For detail, see Iwasawa (1985) and Tsuzuki (1988).

²Maruta (1995) argues against this view. His claim is that this kind of adjective is not a predicate but an adverb. Such an approach, however, fails to account for not only the difference in meaning between (1a) and (2) but the ambiguity in meaning of examples like (i):

(i) John arrived late.

Larson & Segal (1995) point out that (i) is ambiguous: on one reading, *late* is an adjective and predicated of *John*, and on the other, *late* is an adverb and modifies the event of John's arrival. According to them, in the former reading what is late is John and John's arrival is not necessarily late, that is, it may happen in the morning; in the latter, what is late is John's arrival.

³In this paper, we will not be concerned with the functional categories above PrP, for example, INFL (or TENSE) and Agr, which Bowers (1993) postulates in his

To borrow Bowers' words, 'the theory outlined above provides a principled account of the idea, implicit in the rules of (iv) (his (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.' (Bowers (1993: 597)).

⁶In the course of the discussion of double object and dative constructions, Bowers (1993) touches on the issue of the syntactic positions and the determination of the antecedents of the adjunct predicates in question. However, his concern is limited to the case of what we call here OTPs and no mention has been made of STPs. Thus his analysis seems to be insufficient.

⁷The latter type of manner adverb is mentioned as an instance of those which show no discernible change in meaning by Jackendoff (1972: 49). Even Travis (1989), who argues against Jackendoff that some change in meaning is observed as to the adverb, fails to make it explicit how its meaning changes indeed. Thus, we ignore the effect of the position of adverbs on the meaning.

⁸Ken'ichiro Nogawa (personal communication) has pointed out to me that the following sentence appears to be problematic for the analysis proposed here:

(i) *John_i happy_i left the room.

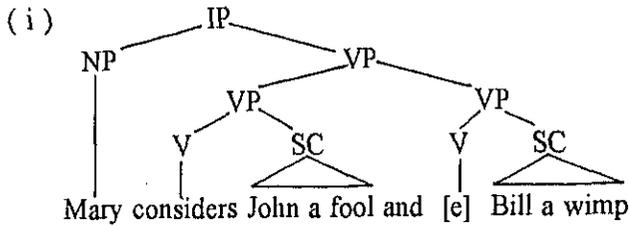
In (i) if the STP *happy* can be adjoined to the left of Pr' as well, just like *quickly*-type adverbs can, the sentence would be wrongly predicted to be grammatical. At this point, I have no principled account for this problem, and instead, let me point out a well-known fact which suggests similarity of STPs to *quickly*-type adverbs. Consider the following:

(ii) Quickly/Happy, John left the room.

cf. *Perfectly/Raw, John ate the meat.

STPs, just like *quickly*-type adverbs, can be preposed to the sentence-initial position. This fact seems to be a piece of evidence in favor of our analysis of the structural position of STPs.

⁹Bowers' explanation is essentially analogous to the one by Larson (1988, 1990). Jackendoff (1990b) disagrees with this sort of explanation and argues against that the examples in (20) can be analyzed as the result of Gapping. The Gapping approach analyzes the structure of (20a) as that in (i), where *e* represents the position of the gapped verb:



Such examples like (20a-e) have lively debate in the literature, with a variety of analyses, and it might be safe to take the issue as unsettled (see, for example, Jackendoff (1971), Hudson (1982,1889), Sag (1976), and so on). In regard to this issue, however, Bowers (1993) argues against the gapping analysis, pointing out the examples given in (ii) and (iii):

- (ii) a. *Mary put the books on the table and Sue [e] the record on the chair.
 b. *John persuaded Mary to leave and Bill [e] Sue to stay.
 c. *Mary considers John a fool and Sue [e] Bill a wimp.

(Bowers (1993: 605 (20a-c))

- (iii) a. I wrote a letter to Mary in the morning and a note to Max during the afternoon.
 b. John gave the book to Mary at Christmas and the records to Sue on New Year's Eve.

(Bowers (1993: 605 (21a,c))

Note that, as shown in (ii), gapping is, quite generally, bad when the gapped constituent contains more than two constituents, while instances of VP-coordination are not subject to such restriction, as in (iii).

Furthermore, Larson (1990) points out that the existence of Right Node Raising sentences containing of VPs of the form in question provides independent support for the claim that objects and their complements, together with a V-trace, are constituents ((iv a,b) from Erteschik-Shir (1987) and (iv c,d) from Bowers (1993)):

- (iv) a. Smith loaded, and his widow later donated, [a valuable collection of manuscripts to the library].
 b. I borrowed, and my sister stole, [large sums of money from the Chase Manhattan Bank].
 c. Sue moved, and Mary also transferred, her business to a different location.
 d. Most people probably consider, even though the courts didn't

actually find, Klaus von Bulow guilty of murder.

Finally, as pointed out in Larson (1990), an ATB account is at least plausible in principle, given similar facts in the language that do appear to involve V-Raising. Larson cites the analysis in Neijt (1979) of Dutch examples given in (v), which are regarded by Neijt as the result of the application of the ATB V-Raising to the verb-second position:

- (v) a. Jan gaf [Marie een appel ti] én [Piet a peer ti].
 'John gave Mary an apple and Pete a pear.'
 b. Jan legde [de worteltjes in de gootste ti] én [het brood op tafel ti].
 'John put the carrots in the sink and the bread on the table.'

I am grateful to Yukio Hirose (personal communication) for bringing this point to my notice.

¹⁰Rothstein (1983) rules out this kind of example for an entirely theoretical reason: her theory predicts that in principle, predication cannot be established within NP. She defines predication in English as in (i):

- (i) Rules of Predicate-linking
 a. Every non-theta-marked XP must be linked as S-structure to an argument which it immediately c-commands and which immediately c-commands it.
 b. Linking is from right to left (i.e., a subject precedes its predicate).

(Rothstein (1983: 27))

That is, she regards predication as the relation which establishes only between maximal projections. Because she does not take DP Hypothesis, predication relation cannot be established, by definition, within NP. Notice, however, that this is merely a theoretical problem: if we take DP Hypothesis, the predication relation can hold for the element in Spec of DP and the NP which is the complement of D.

¹¹One may wonder why STPs and OTPs are allowed to occur in NPs, in spite of their licensing mechanism as adverbials. Concerning this point, the analysis of bare NP adverbs by Emonds (1987) is suggestive, where a bare NP adverb is analyzed as a preposition phrase with an empty preposition: these adjunct predicates behave in a parallel way to prepositional phrases with an implicit preposition, not to real adverbs.

¹²Williams (1980) defines the notion of c-command and c-subjacent as (i a) and (i b), respectively.

- (i) a. A c-commands B iff every branching node which dominates A dominates B.
 b. B is c-subjacent to A iff A is dominated by at most one branching node which does not dominate B.

¹³Williams (1985) tries to explain examples like (36c) by claiming that the (semantic) subject of *nude* is not the implicit argument but the game, since 'one may call a game nude if it is played by nude people.' But it is unclear whether the same account holds for the following examples presented in Okada (1992a, 193):

- (i) a. This project should not be attempted (by beginners) [PRO unaided].
 b. When drinking is suspected, the police make the driver perform tests that can only be accomplished [PRO sober].
 c.(?)Motor vehicles should never be operated [PRO drunk].
 d. You will be stared at (by them) [PRO open-mouthed].

¹⁴Okada (1992a) makes an apparently attractive claim that the reason why the PRO subjects in such cases like (33c) and (34b) need not have an explicit controller is that they are nonobligatory control PROs. Following Hornstein & Lightfoot (1987), Okada assumes that PRO is anaphoric (and must be obligatorily controlled) when it is governed while it is pronominal (and can be non-obligatory control PRO) when not governed. In Okada's analysis, STPs, like [PRO *drunk/nude/angry*] in (33c) and [PRO *nude*] in (34c), are adjoined to VP, where the PRO subject of the SC is not governed by V under the notion of government by Chomsky (1986). Therefore, theoretically, the PRO subject in (33c), for example, can freely refer. Okada is forced to introduce the semantic constraints on the controller of PRO given in (ii) in view of the fact that native speakers of English judge that the controller of [PRO *naked*] in (i) is no one but *John*.

- (i) John left the room [PRO *naked*].
 (ii) a. The controller must be Agent or Theme of the main verb.
 b. Selectional restriction must be met.

(Okada (1992a: 192))

However, the validity of the first constraint is uncertain. Consider the following, which is cited from Jackendoff (1990):

- (iii) John_i received the letter [PRO_i drunk_i].

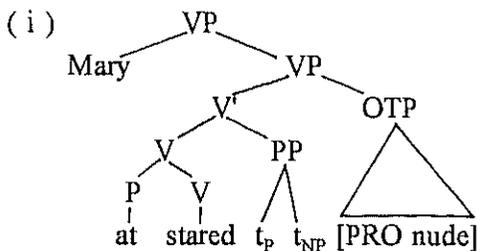
This sentence is acceptable even if *John* is Goal, according to Jackendoff.

¹⁵One might think that in examples like (41), *Mary* and *nude* constitute a small

clause, as in the ordinary case like *consider* [NP XP]. However this is not the case, as shown by the relative word order between by phrases and italicized predicates in the following:

- (i) a. Mary was stared at by John *nude*.
 b. Bill is considered *a fool* by Sue.

¹⁶For example, the view of reanalysis in Branigan (1992) makes it possible for *Mary* to c-command the PRO subject of *nude*. According to her the preposition *at* is incorporated into the V *stared* at LF, and the NP embedded within the PP, *Mary*, is raised to the some projection of V for its Case checking. After the process, the structure of VP of (38) is represented as follows:



¹⁷This claim does not hold true for the DP analysis which is advocated by Abney (1987).

¹⁸Safir (1987) analyzes an implicit argument as an argument which is projected, but not linked, defining the notion PROJECTED and LINKED as in the following:

- (i) An argument is
 a. *linked* if it is mapped onto a structural position at D-structure,
 b. *projected* if it is syntactically non-inert at D-structure.

According to his theory, an external argument of a nominal head is projected only when an internal argument (of NP) is linked. Therefore, *Bill* in (45a) cannot be qualified as a projected external argument of *treatment* as well.

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