A Note on Relative Clause Extraposition★

Takeshi Furukawa

0. Introduction.

Several analyses concerning so–called extraposition from NPs have been proposed within a framework of the generative grammar. One of the main issues of the discussions is how "the extraposed elements" (EX) should be related to the head NPs. That is, how can (1) be related to (2) in grammar ?

(1) A man came into the room $[_{EX}$ who was from London$]$.
(2) A man who was from London came into the room.

There are two approaches in analyzing EX. One is a movement analysis, which assumes that (1) is syntactically derived from (2) by Move α,[1)] and the other is ar interpretive analysis, which claims that the alleged extraposed element in (1) is base–generated, not derived by movement, but it is related to the head NP by an interpretive rule : the Complement Principle.[2)]

In this paper, we will demonstrate that the syntactic properties of (1) can follow naturally from the Minimalist Program of Chomsky 1992. The question whether or not Move α associates an extraposed relative clause (REX) with its head NP is not our main concern here. We will refer to EXs as "extraposed" elements except REXs.

In section 1, we will show some differences between REX and EX and propose that they should be treated differently. Section 2 will deal with some problems of REX in terms of Predication. In section 3, we will propose an alternative.

1. Some Differences between REX and EX

Some syntactic differences between the REX and the EX are observed by several researchers (Johnson 1985 among others).

1. 1 Definiteness Effects

It is not possible to associate extraposed PPs with definite NPs, as it is case with *wh*–movement. Compare the following examples.[3)]

(3) a. ★[The review *t*] came out yesterday [of John's book].
b. [A review *t*] came out yesterday [of John's book].
(Fiengo 1980 : 151)

(4) a. ★I remember [John's friend *t*] yesterday [from Chicago].
b. ★I ate [every dish *t*] on Tuesday [from Cantor's].
(Johnson 1985 : 102)

(5) a. ★Who did you remember [John's friend of *t*]?
(vs. Who did you remember [a friend of *t*]?)
b. ★Who did you buy [every picture of *t*]?
(vs. Who did you buy [a picture of *t*]?) (Johnson 1985 : 102)

Likewise, appositive clauses related to definite NPs are ruled out.

(6) a. I spread [★your / a rumor *t*] yesterday [that Mary is in town].
b. I read [★your / a proof *t*] last night [that Godel's Incompleteness Theorem is incomplete]. (Johnson 1985 : 106)

However, REXs are ruled in when they are related to definite NPs.[4)]

(7) a. [The man *t*] came in [that we talked about].
b. [The fact *t*] remains [that we lost]. (Fiengo 1980 : 151)

(8) a. I met [your friend *t*] yesterday [who knew him quite well].
b. I brought [my book *t*] along [that tells everything about everything]. (Johnson 1985 : 107)

1. 2 Predicate Restrictions

Furthermore, in case of EXs related to subject NPs, we can see variations of acceptabilities according to types of predicates. In case of pure transitive and pure intrasitive verbs, EXs related to subjects are ill–formed.

(9) a. ★[A man *t*] ate the oranges [with green eyes].
b. ★[A woman *t*] left the room [with green eyes].
c. ★[A child *t*] screamed [with green eyes]. (Johnson 1985 : 103)

In contrast, EXs related to derived subjects of unaccusative and passive verbs are well–formed.

(10) a. [A man *t*] entered [with green eyes].
b. [A woman *t*] walked in [with a scarlet carnation].
c. [A child *t*] was seen [with a yo–yo]. (Johnson 1985 : 103)

The derived– nonderived "subject" asymmetries are also observed in case of appositive EXs.

(11) a. [A rumor *t*] was spread [that Mary is in town].
b. ★[A rumor *t*] means that Gary is wrong [that Mary knew Godel well]. (Johnson 1985 : 106)

(12) a. [A proof *t*] has been published [that Godel's Incompleteness Theorem is incomplete].
b. ★[A proof *t*] implies that Godel was lazy [that Godel's Incompleteness Theorem is incomplete]. (Johnson 1985 : 106)

But it is not true of REXs.

(13) a. ?? [A man *t*] knows Godel [who understands his Incompleteness Theorem].
b. ?? [A woman *t*] said that Gary had arrived [who knew him quite well]. (Johnson 1985 : 107)

2. Relative Clauses and Predication

We have seen that there are sharp contrasts between REX and EX, and we will propose that these contrasts can be accounted for by Predication; REXs related to a subject NP and a definite NP are allowed due to Predication; whereas PP and appositive EXs related to a non–derived subjcet NP and a definite NP are not.

Following Johnson 1985 and Furukawa 1991, we will assume that EX is syntactically derived by Move. α and related to its associate NP by a trace left by the movement.[5] [6] On the other hand, following Browning 1987, among others, we will assume that the relation between a restrictive relative clause and its head is basically equivalent to a subject–predicate relation.[7] [8] Thus, the relation is identified by Predication.

2. 1 Predication

Predication is a structural condition on a subject– predicate relation, which states that *a predicate and ite associate NP must m– command each other* and that Predication involves coindexing between a subject and its predicate. The relevant notions to Predication are as follows.

(14) m–command

α m–commands β if and only if α does not dominate β and every maximal projection dominating α dominates β.

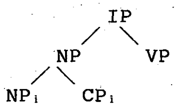
(Chomsky 1986b : 8)

(15) dominance

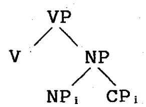
α is dominated by β only if it is dominated by every segment of β. (Chomsky 1986 b : 7)

Let us consider how Predication works in relative clause structures. First, several analyses on the treatment of restrictive and non–restrictive relative clauses have been proposed based on the syntactic and semantic differences; however, in this paper, we will just focus on restrictive relative clauses and tentatively assume that the restrictive relative configurations are like the following tree diagrams.[9]

(16) a.



b.

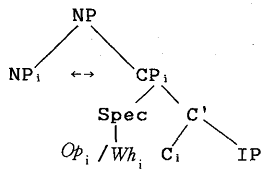


Restrictive relative clause CP is Chomsky–adjoined to its head NP, so

NPs and CPs are in a mutual m–command relationship. In (16) the m–command domains of NPs and CPs are IP (a–example) and VP (b–example), respectively.

Furthermore, following Browning 1987, we will assume that a non θ–related subject–predicate relation can be established if the subject agrees with a chain contained in the predicate. In the case of relative clauses the agreement chain is established as in the following diagram :

(17)



NP and CP agree by virture of satisfying the structural condition on a subject–predicate relation ; CP agrees with C, since CP is a projection of C, and then *Wh*$_i$ or null operator *Op*$_i$ agrees with C, via SPEC–head relation. Consequently, the head NP and a chain contained in the predicate agree.

2. 2 REX and Predication

Before examining how Predication works in REX and its head, we will briefly review observations with respect to some syntactic tests for adjunction sites of REX.

2. 2. .1 Positions of REX

We will explore whether the REXs are inside VP or outside VP by applying syntactic operations, such as VP–deletion, VP–preposing, and *wh*–clefting.

These operations indicate that REXs related to object NPs (OXs) are included in VP, since they accompany and do not strand OXs.

(18) a. John *met a man last week* [*who was from Philadelphia*], and George did [$_{VP}$ *e*] too.

b. ★John *calls people* [whom he has never met before] , and Bill does [$_{VP}$ *e*] [whom he has never met before]. (Guéron 1980 : 642)

(19) a. John said that he would meet a man at the party [who was from Philadelphia], and [$_{VP}$meet a man at the party [who was from Philadelphia]] he did t_{VP}.(Rochemnot and Culicover 1990 : 34)

b. ★John said that he would meet a man at the party [who was from Philadelphia], and [$_{VP}$meet a man at the party] he did t_{VP} [who was from Philadelphia].

(Culicover and Rochemont 1990 : 28)

(20) What John did was bring a book along [that tells everything about everything]

We conclude that OXs are and must be within VP.

On the other hand, REXs related to subject NPs (SXs) are stranded by the operations, supporting that SXs are within IP, outside VP.

(21) a. Although nobody would *ride with Fred* [who knew just him], people would [$_{VP}$ *e*] [who knew his brother].(Guéron 1980 : 641)

b. Many people have *left the party* [who John despises], but few have [$_{VP}$ *e*] [who Mary admires]. (Guéron and May 1984 : 3)

(22) a. They said that a man would come in, and [$_{VP}$ come in] a man did t_{VP} [who had lived in Boston].

b. ★They said that a man would come in, and [$_{VP}$ come in] [who had lived in Boston] a man did t_{VP}.

(Culicover and Rochemont 1990 : 35)

(23) a. ? What someone did [who had lived in Boston] was come into the room.

b. ★What someone did was come into the room [who had lived in Boston]. (Culicover and Rochemont 1990 : 37)

However, as argued by Culicover and Rochemont 1990, and Rochemont and Culicover 1990, SXs can be inside VP. VP–deletion accompanies them when subject NPs are stressed.[10]

(24) a. A MAN *came in* [*who had lived in Boston*], and a WOMAN did [$_{VP}$ *e*] too.

b. Although none of the MEN did [$_{VP}$ *e*], several of the WOMEN *went to the concert* [*who were visiting from Boston*].

(Culicover and Rochemont 1990 : 30)

We assume that the SXs can be either in IP or in VP, and that OX must be inside VP.

Since Chomsky 1986 b, it has been assumed that the only possible adjunction is to a maximal projection, as stated in (25).[11]

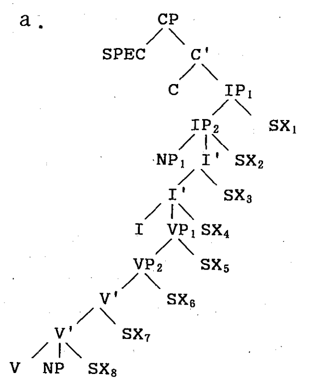
(25) Adjunction is possible only to a maximal projection that is a nonargument.[12] (Chomsky 1986 b ; 6)

Since Kayne 1983, binary branching has been the only possible option in X' theory, hence sister-adjunction is not allowed. Therefore, given (25) and the binary branching condition on X'-theory, it follows from the observations above that the SX Chomsky-adjoins to IP or VP, while the OX must adjoin to VP, adopting Culicover and Rochemont's papers.

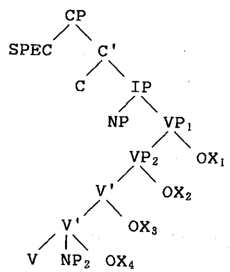
2. 2. 2 Application of Predication

We will investigate whether Predication can correctly predict syntactic positions of REX and reject all the possible adjunction sites of REX, in terms of Predication. Consider the following possible adjunction sites.

(26) a.



b.



When SX adjoins to IP, SX_1 is not dominated by every segment of IP: a maximal projection dominating NP_1, because the IP_2 segment does not dominate SX, as we can see (26a). Thus, SX_1 and NP_1 are not in a mutual m–command relation; as a result, Predication makes a wrong prediction on SX.

Suppose that SX does not adjoin to IP but appears within IP or Chomsky–adjoins to VP. In cases of SX_2–SX_5, mutual m–command relations between NP_1 and these SXs can be established. However, (25) and the binary branching condition on the X'–theory exclude the possibilities of SX_2 sister–adjoining to IP, SX_3 Chomsky–adjoining to I' and SX_4 sister–adjoining to I'.[13] Therefore, the only possible structure which satisfies the mutual m–command requirement will be adjunction to VP: SX_5. Predication would wrongly predict that the only possible adjunction site of the SX must be VP, incompatible with the observations supporting that SXs can be in IP.

It is true of SX_6–SX_8. These cases contradict the fact that SX can appear in IP and do not satisfy any conditions on Predication, the theory of adjunction, and the binary branching condition on X'–theory.

The same things can be applied to OXs. The constraint (25) on adjunction and the binary branching condition on the X'–theory only determine that OX must adjoin to VP.[14] NP_2 and OX_1 are, however, not in a mutual m–command relation: NP_2 does not m–command OX_1, since OX_1 is not dominated by every segment of the VP: VP_2, the lower segment of the VP, does not dominate OX_1.

The definition of m–command based on every segment Dominance would be amended to the one based on Containment (27) so that the REXs and the head NPs could m–command each other.

(27) α contains β if some segment of α dominates β.
(Chomsky 1992 : 15)

OX_1 would be dominated by the VP, which is made up with VP_1 and VP_2, because every segment of the VP does not dominate OX_1 but VP contains OX_1 since VP_1 segment of the VP dominates it, hence NP_2 and OX_1 would be in a mutual m–command relation if we adopt the definition based on (27). As far as OX is concerned, the revision of m–command seems to be desirable.

Then what about SX ? In case of case of Sx's adjunction to VP, NP_1 and SX_5 do not m–command each other, since the VP dominating SX_5 does not contain NP_1. Therefore, the VP adjunction analysis of SX is incompatible with m–command in terms of the Containment. Given the notion of m–command based on the Containment, then it follows that it would be the only case that SX adjoins to IP, and hence, Predication would make wrong prediction again.

Suppose that Predication is defined as mutual c–command, as originally assumed by Williams 1980. We cannot avoid adopting the non–binary branching phrase structures, and hence SX and OX must sister–adjoin to IP and VP respectively, resulting in insufficient predictions of adjunction sites of REXs. Therefore, Williams' Predication provides no account for the fact that SX can adjoin to VP.

Furthermore, the mutual c–command restriction on Predication under the VP Internal Subject Hypothesis (ISH) forces Predication to apply at D–Structure (DS), and SX must sister–adjoin to VP and OX must sister–adjoin to V' [15) Here, sister–adjunction must be assumed again, thus situations would not be improved.

(28) a. b.

Suppose that under ISH, Predication is satisfied at D–Structure (DS) and that SX is raised from a VP internal position to a higher position: since SX is sometimes in IP, SX must move to a higher positon from a DS position. In this case, we would have to postulate an extra mechanism to explain the boundedness of the relation between REXs and their heads; hence, we have a conceptually undesirable result in terms of simplicity of grammar.

Or another possibility would be to assume that Predication must be satisfied not only at DS but also at S–Structure (SS) or LF. However, it is not possible for head NPs to c–command REXs, as we have seen before, for the only available option that the theory of movement allows in this case is adjunction, not substitution. A movement operation of SX is, if it exists, not to a SPEC position but to an IP–adjoined position.

In sum, we have assumed that Predication identifies head NPs and relative clauses; however, we have shown that it is not possible to treat REXs by virtue of any versions of Predication, in the light of the adjunction sites of the REX, the X'–theoretic assumptions, and the possible configurational restrictions on Predication.

3. Solution

In the last section, we have seen that no possible versions of Predication can explain the adjunction sites of REXs properly.[18] The next question to examine is whether the adjunction sites of REXs which we have concluded to assume are right or not.

On the basis of the discussion so far, in order for REXs to satisfy Predication, we reach the generalization as in (29).

(29) $\ldots [_{\alpha}$ NP $\ldots [_{\beta 1} [_{\beta 2} \ldots]$ REX$]] \ldots$
where α and β are maximal projections and no maximal projections intervene between α and β.

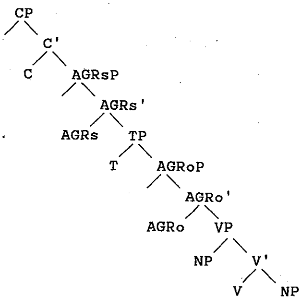
In (29), α dominates NP and REX, while β does not dominate NP and REX. β_2, the segment of β, does not dominate REX. Thus, the first maximal projection dominating REX is α, not β. α is the only maximal projection which dominates both NP and REX in (29). Therefore, NP and REX m–command each other, satisfying Predication.

3. 1 The Minimalist Model

We will briefly outline some assumptions in the Minimalist Model, which are relevant to our discussion.

Chomsky 1989, 1992 extends Pollock 1989 and proposes a sentence structure.

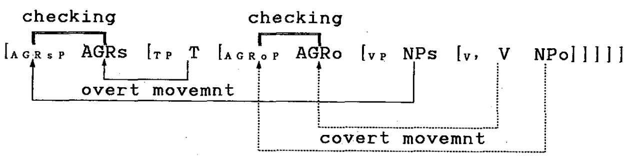
(30)



Every lexical (V, N, A, P) and functional category (C, T, AGR) has features to be checked. Chomsky regards both agreement and structural Case features as manifestations of the SPEC–head relation. Such Case properties depend, for example, on characteristics of T and the V head of VP. Therefore, T raises to AGRs and V raises to AGRo.

Features are assumed to have strong–weak distinctions: strong features are checked in overt syntax, while weak features are checked in covert syntax.[17] Hence, according to Chomsky 1992, subject NP originates in a VP–internal position, namely, a SPEC–VP position, then raising to a SPEC–AGRsP position to check strong CASE (agreement and Case–features) in overt syntax, while object NP must move to a SPEC–AGRoP for weak feature–checking in covert syntax. These processes are schematized as follows.

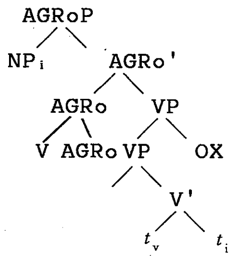
(31)



3. 2 Some Consequences

Suppose that Predication applies in covert syntax, following Ike–uchi 1990 and Demirdache, 1991, among others.[18] If OX adjoins to VP, as many syntactic tests verify, object NP and OX are in a mutual m–command relation, since object NP must move to a SPEC–AGRoP for the feature checking in covert syntax.

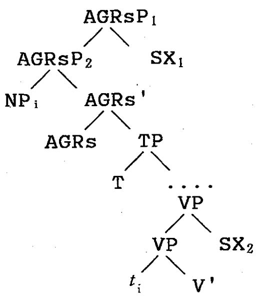
(32)



Thus the Predication relations can be adequately established in covert syntax, because the structure meets the generalization in (29).

Let us consider SX. Recall that SX adjoins either to IP or VP. In case that SX adjoins to VP, (29) stands if we adopt the clause structure assumed in section 2. Given (30), however, in both cases, Predication is violated in overt and covert syntax. Consider (33), where SX adjoins to AGRsP (=IP) or VP.

(33)



In (33) the relation between SXs and NP_i or t_i does not meet (29).

To solve this problem, we adopt Branigan's 1992 sentence structure like the following.

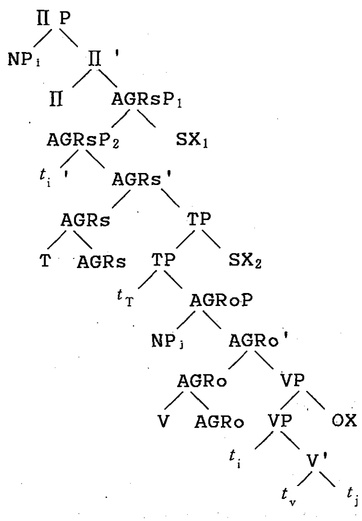
(33) [$_{CP}$ C [$_{\Pi P}$ Π [$_{AGRsP}$ AGRs [$_{TP}$ T [$_{AGRoP}$ AGRo [$_{VP}$ NP [V......]]]]]]]

Branigan 1992 introduces a new maximal projection between CP and AGRsP in order to account for subject–object asymmetries, such as *that*–trace effects and so–called "vacuous" movement effects.[19] Branigan calls this maximal projection ΠP. His basic idea is that if both subject NP and object NP occupy a SPEC–AGRP position in covert syntax, there is no accounting for the subject–object asymmetries. Therefore, the difference in syntactic behaviors between subjects and objects is ascribed to the positions that they occupy.

If Predication determines adjunction sites of REXs, then SX adjoins to either AGRsP or TP with Branigan's clause structure, and consequently, these adjunction sites of SXs meet the generalization in (29).

If this claim is on the right truck, it follows that SX is structurally higher than OX, which adjoins to VP.[20] Therefore, we have the following structure in covert syntax.

(34)



Each pair of REXs and their head NPs in (35) satisfies Predication: SX_1 and NP_i, SX_2 and t_i , and OX and NP_j are in mutual m–command relations. Note that OX and t_i in the SPEC–VP position is not in a mutual m–command relation.

Furthermore, this structure is empirically proven.

(35) a. A man came into the room last night [$_{OX}$ that I had just finished painting] [$_{SX}$ who had blond hair].
b. ★A man came into the room last night [$_{SX}$ who had blond hair] [$_{OX}$ that I had just finished painting]. (Nakajima 1992 : 314)

Provided that both SX and OX could adjoin to VP, this contrast would be explained not structurally, but with recourse to an interpretive dependency rule called the Interpretive Nesting Requirement, proposed in Rochemont and Culicover 1990[21] If we assume the adjunction sites of REXs as in (34), (35) is straightforwardly accounted for by virtue of the claim that SXs are structurally higher than OXs. Let us go on to reconsider the data presented in the last section to support our claim that SX can adjoin to VP or IP.

3. 2. 1 VP—Deletion

Recall that the VP–deletion operation accompanies but does not strand OX in (18), demonstrating that OX adjoins to VP.

(18) a. John [$_{VP}$ *met a man last week* [*who was from Philadelphia*]], and George did [$_{VP}$ *e*] too.
b. ★John [*calls people*] [whom he has never met before] , and Bill does [$_{VP}$ *e*] [whom he has never met before].

On the other hand, VP–deletion can strand SX. Our analysis does not pose any problems because we assume that SX adjoins to higher positions than VP: TP or AGRsP.

(21) a. Although nobody would *ride with Fred* [who knew just him], people would [$_{VP}$ *e*] [who knew his brother].

However, with regard to the data like (24), our analysis of SX would confront a problem.

(24) a. A MAN *came in who had lived in Boston,* and a WOMAN did $[_{VP}\ \underline{e}]$ too.

(24) indicates that SX can adjoin to VP as well, because VP–deletion can erase SX, yet we assume that it can adjoin to TP or AGRsP to satisfy Predication in covert syntax.

To solve this problem, we will incorporate VP–deletion into the Minimalist Model. Following Lobeck 1990 and Martin 1992 among others, we will assume that only a constituent that is the complement of a functional head that agrees with its specifier may be deleted, based upon the taxonomy of functional categories of Fukui and Speas 1987, who divide each functional categoy such as T, D and C, according to their agreement abilities.[22)] When agreement or some feature checking takes place via SPEC–Head relation in functional categories, deletion is possible. Consider the following contrasts.

(36) a. John $[_{VP}$ likes basketball] and $[_{TP}$ Bill $[_{T'}$ $[_{T}$ does] $[_{VP}$ *e*]]] too.
b. ★John considered $[_{TP}$ Mary $[_{T'}$ $[_{T}$ to] $[_{VP}$ be clever]]] and Mike considered $[_{TP}$ Sally $[_{T'}$ $[_{T}$ to] $[_{VP}$ *e*]]]. (Martin 1992 : 10)

(37) a. $[_{AGRsP}$ John fell in love with someone], but I don't know $[_{CP}$ who $[_{C'}$ [+wh] $[_{AGRsP}$ *e*]]].
b. ★$[_{AGRsP}$ John claims that Pam loves him], but I don't believe $[_{CP}$ $[_{C'}$ [that] $[_{AGRsP}$ *e*]]]. (Martin 1992 : 10)

Note that in the Minimalist Model, finite T bears Nominative Case and T must be overtly raised to AGRs for Case checking with NP in a SPEC– AGRsP position. In this respect, "VP"–deletion can be regarded as TP–deletion, since it is not VP but TP which is a complement of a functional head (in this case, AGRs) that agrees with its specifier.

(36) a'. John [$_{TP}$ likes basketball] and Bill [$_{AGRs}$ do–AGRs] [$_{TP}$ e] too.

Therefore, TP–deletion operation can erase SX together as in (24) when SX adjoins to TP, and accordingly, our analysis poses no problem with respect to "VP"–deletion phenomena.

3. 2. 2 VP–Preposing

Let us consider OX in terms of VP– Preposing. Under the standard assumption that a preposed constituent is VP, OX and its associate are not in a mutual m–command relation in (19), as we have seen before.

(19) a. John said that he would [$_{VP}$ [$_{VP}$ meet a man at the party] [who was from Philadelphia]], and [$_{VP}$ [$_{VP}$ meet a man at the party] [who was from Philadelphia]] he did t_{VP}.

b. ★John said that he would meet a man at the party [who was from Philadelphia], and [$_{VP}$ meet a man at the party]he did t_{VP} [who was from Philadelphia].

Thus we assume that Predication applies in covert syntax, where object NP moves up to the SPEC–AGRoP for CASE–checking, and a mutual m– command relation between the Object NP and OX can be established, satisfying Predication requirement. We will propose that to satisfy Predication in covert syntax, "VP"– preposing must be re–analyzed as AGRoP–preposing. This proposal can capture the contrast in (19). Consider the representation of (19) in covert syntax.[23)]

(19)' a. ......, and [$_{AGRoP}$ a man$_j$ [$_{AGRo}$ meet–AGRo] [$_{VP}$ [$_{VP}$ t_i [$_{V'}$ t_V t_j at the party]] [who was from Philadelphia]]] he$_i$ did t_{AGRoP}.

b. ★.... and [$_{AGRoP}$ a man$_j$ [$_{AGRo}$ meet–AGRo] [$_{VP}$ [$_{VP}$ t_i [$_{V'}$,t_V t_k at the party]] [$_{IIP}$ he$_i$ did t_{AGRoP} [who was from Philadelphia]].

In (19' a), *a man*$_j$ and OX are in a mutual m–command relation, whereas in (19' b) OX and its head NP never m–command each other when OX is stranded by the application of AGRoP–preposing.

The contrast of SX in (22) can be explained in our analysis of

AGRoP–preposing.

(22) a. They said that a man would come in, and [$_{VP}$ come in] a man did t_{VP} [who had lived in Boston].

b. *They said that a man would come in, and [$_{VP}$ come in] [who had lived in Boston] a man did t_{VP}.

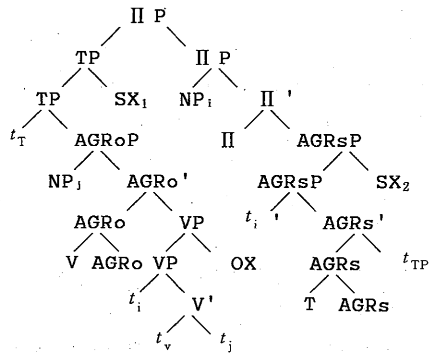
In our analysis, the preposed constituent is AGRoP, not VP, thus the claim that SX adjoins to TP or AGRsP predicts the contrast in (22) correctly, for it is not possible for AGRoP–preposing to prepose SX adjoining to TP or AGRsP together.

What if a constituent preposed by the so–called "VP"–preposing is AGRsP or TP? The first possibility of the AGRsP–preposing analysis cannot stand, because we cannot explain "*do*–support" phenomena in the matrix sentence on the basis of the assumption that T is overtly raised to AGRs for feature–checking and AGRs–T is realized as *do* or *did*. Consider the following representation of AGRsP–preposing structure in covert syntax.

(38) ...... [$_{IIP}$ [$_{AGRsP}$ t_i' T–AGRs [$_{TP}$ t_T [$_{AGRoP}$ NP_j V–AGRo [$_{VP}$ t_i [$_{V'}$ t_V t_j]]]]] [$_{IIP}$ NP_i t_{AGRsP}]].

As far as the second possibility of the TP–preposing analysis is concerned, the TP–preposing analysis can explain the facts in (19) and (22). See the following.

(39)



In terms of OX, we have no problems under our TP–preposing analysis. Indeed, it is possible to prepose TP including SX_1; however, in the resultant structure, neither NP_i nor t_i' is in a mutual m–command relation with SX_1, violating Predication. Therefore, after "VP"–preposing, the only available structure that Predication predicts is the case where SX is stranded, adjoining to AGRsP: NPi and SX_2 m–command each other. Our proposal, then, poses no problems in light of "VP"–preposing, either.[24)]

3. 2. 3 *Wh*—Clefting

We have seen in the last section that data with respect to interactions with REX and *wh*– clefting indicate that SX is inside IP and outside VP, whereas OX is inside VP.

(20) What John did was bring a book along [that tells everything about everything].

(23) a. ? What someone did [who had lived in Boston] was come into the room.
b. ★What someone did was come into the room [who had lived in Boston].

We must regard VP in the focus position as AGRoP or TP, as we have assumed in terms of derivation of "VP"– deletion and "VP"– preposing operations, because for feature–checking, V goes to AGRo and complement to V goes up to SPEC–AGRoP in covert syntax. Thus, in (20), the mutual m–command requirement can be satisfied in covert syntax if OX adjoins to VP.

In (23 b), SX is not properly related to its head NP *someone*, because whether SX adjoins to VP or AGRoP in a focus position, a mutual m–command relation cannot be established. Even if the focused constituent in (23) is assumed to be TP, Predication is violated in (23 b) based on the fact that each m–command domain of SX and its head is restricted to the focus position and the subject clause, respectively.

In this section, we have proposed that REX is subject to Predication in covert syntax. Our claims that SX adjoins to TP or AGRsP and that OX adjoins to VP with Branigan's clausal structure solve the structural problems in light of Predication, and our analysis of REX does not contradict several syntactic phenomena, such as "VP"–deletion, "VP"–preposing, and *wh*–clefting.

4. Concluding Remarks

In this paper, we have dealt with problems of the so–called extraposition of restrictive relative clauses from NPs. We have seen that the mutual m–command requirement of Predication can best capture the adjunction sites of REXs in the clausal structure proposed by Branigan 1992.

We have not pursued the question whether the extraposition is a movement operation or not. Note, however, that in either case, REX and its head must be licensed by Predication, required by Principle of Full Interpretation (Chomsky 1986 a, 1989, 1992).

Adjoin α, advocated by Lebeaux, 1991 or Generalized Transfomation, in the sence of Chomsky 1992, is a possible derivation of REX. In overt syntax, REX can adjoin anywhere as long as Predication is respected. Or, it is also possible to say that extraposition is, in fact, a movement operation and that Predication can save an illicit extraction from a subject NP. We leave these possiblies open.

Further research will be required to complete our research.

Notes

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1) For details of proposals of movement analyses on extraposition from NP, see Baltin 1981, Furukawa (1991), Johnson 1986, Nakajima 1989, 1992, and Suzuki 1993.

2) See Culicover and Rochemont 1990, and Rochemont and Culicover 1990 for motivation. We will not discuss which analysis of the two (that is, movement and interpretive) analyses is superior to the other in this paper.

3) For expository purposes, we assume "*t*" to indicate the relation between EXs and their associate NPs. Whether movement is involved in this construction, we will leave open in this paper. See the papers cited in note 1) and 2).

4) However, Y. Suzuki (personal communication) has kindly pointed out to us that Chomsky 1981 observes that REX exhibits a kind of opacity effect:

(i) a. *[John's novel *t*] arrived last week [that you ordered].
b. [A certain book *t*] arrived last week [that you orderd].
c. [The books *t*] arrived last week [that you ordered].
(Chomsky 1981: 219)

On the basis of the data (ia), it may be possible to arugue that movement is involved in REX and that the trace by the movement is subject to Binding theory, as analyzed by Nakajima 1989. But this possibility cannot be extended to the data like (7). We will leave this question open.

5) See Furukawa 1991 for a proposal to explain the predicate restriction on EX based on ECP and LF reconstruction.

6) There are some differences between leftward and rightward movement observed. One of the most crucial differences is concerned with locality between moved elements and their traces. Several proposals on the boundedness between EXs and their head NPs have been put forward. For a Binding theoretic proposal, see Nakajima 1989, 1990. For approaches based on Bounding theory, see Baltin 1981, Johnson 1986. For Government approaches, see Guéron 1980, Guéron and May 1985, Culicover and Rochemont 1990, and Rochemont and Culicover 1990.

7) See Browning 1987 for details of motivation. See also Rizzi 1990.

8) Some similarities and differences between REXs and secondary predicates are discussed in Johnson 1985 and Suzuki 1993.

9) We will not deal with structures of relative clauses any further. See Borsley 1992, Demirdache 1991, and Fabb 1990 for discussions on the differences between restrictive and non–restrictive relative clauses.

10) For more examples to motivate that SX can adjoin to VP, see Culicover and Rochemont 1990, and Rochemont and Culicover 1990. See Suzuki 1993 for further discussons on the data supporting the VP–adjunction possibility.

11) Of course, a head can adjoin to another head as long as some principles of grammar allow it to do so. See Chomsky 1986 b, 1989, 1992, and Chomsky and Lasnik 1991.

12) Indeed, (25) is imposed on adjunction as a movement operation. Strictly speaking, as for base-generated adjuncts, we must revise (25) so as to allow them:

(i) Adjunction is possible only to a maximal projection.

Therefore, we must assume (25) and (i). Whether REX is syntactically dereived or not, (25) and (i) will restrict adjunction sites of REX to maximal projections.

13) Y. Suzuki (p. c) has pointed out to us that there are some data supporting X′–adjunction. One of such examples would be the tollowing.

(i) Sara undoubtedly has dog for a walk. (Branigan 1992:80)

In this regard, SX_3 should be allowable. If it were, Predication could not predict the adjunction site proprely, since in some cases, SX can be inside VP. See Branigan 1992 for discussion on the data like (i).

14) As S. Fujimoto (p. c) has pointed out to us, OX_2 might be allowable; however, subject-object asymmetries in terms of extraction phenomena from extraposed PPs indicate that OX_2 is not a possible adjunction site, under Chomsky 1986 b. See Furukawa 1991.
If we adopt VP internal subject hypothesis, OX_2 will be ruled out by the binary condition. See below.

15) See Koopman and Sportiche 1988, Fukui and Speas 1986 and references cited there.

16) Indeed, under ISH, it might be possible to predict the adjunction sites of REXs with Predication based on the Containment. However, when SX adjoins to VP, this version of Predication cannot capture the data presented in 2.1.1., in terms of VP-preposing and *wh*-clefting: SXs may not be accompnaied and must be stranded by these operations. Consider the following structures.

(i) a. *..., $[_{VP}\ [_{VP}\ t_i\ [_{V'}\ V\ldots]]\ SX_1]$, NP_i did t_{VP}.
b. *What NP_j did was $[_{VP}\ [_{VP}\ t_i\ [_{V'}\ V\ldots]]\ SX_2]$

Even though SXs and subject traces in a SPEC-VP (t_i and t_j) are in mutual m-command relations, the strings in (i) are ill-formed. Hence, we reject this possibility. See our discussion in 3.2. below.

Furthermore, OX and a subject trace in a SPEC-VP are also in a mutual m-command relation under this vertion of Predication. Predication relations should be unambiguous, since some theta-relations are entablished under Predication. See McNulty 1988 for the simlar claim.

17) See Chomsky 1992 for details of the weak–strong feature distinction. Overt syntax representation is basically equivalent to SS, and covert syntax is equivalent to LF in the Government and Binding framework.

18) For details of these proposals, see Ike–uchi 1990, Demirdache 1991, and Guéron and May 1985. They argue for their proposals on different grounds.

19) See Chapter 4 of Branigan 1992 for details of discussion and motivation for this category.

20) However, Koizumi 1993 assumes that AGRP is not a possible adjunction site. See Koizumi 1993. We will not discuss this possibility in this paper.

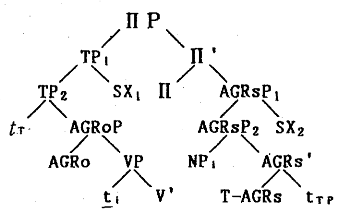
21) See Nakajima 1992. Nakajima 1992 discusses some problems of the Interpretive Nesting Requirement of Rochemont and Culicover 1990 and proposes an alternative based on Relativized Minimality in the sense of Rizzi 1990.

22) See Fukui and Speas 1985 for more details of their framework.

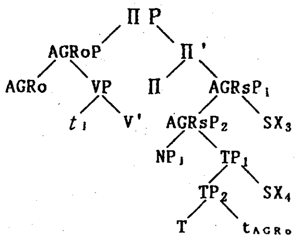
23) We tentatively assume that "VP"-preposing is an sdjunction operation to ΠP. Z n fact it is also possible to assume that "VP"-preposing is I substitution operation to a SPEC-ΠP, as Branigan 1992 assumes in case of locative inversion. But see note 24) below.

24) However, given the possibility that "VP"-preposing is a movement to a SPEC-ΠP, no appropriate Predication relation will be established in case of SX when we assume that a preposed constituent is TP. Consider the following structures.

ⅰ) a.



b.



In this case, SX_4 is only SX that satisfies Predication, because SX_4 and NP_j m-command each other. Hence, the substitution analysis of the preposing does not contradict the data either, only if we assume that the preposed element is AGRoP.

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