PP Extraposition Revisited

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0. Introduction

In Furukawa 1991, we have argued that so-called extraposition structures, as in (1), are derived from structures like (2) by Move with recourse to LF reconstruction within the framework of Chomsky 1986.

(1) A man came into the room [from London].
(2) A man [from London] came into the room.

However, in Furukawa 1994, we have cast a doubt on so-called movement analyses of elements extraposed from NPs (EXs), with respect to optionality, clause-boundedness, and predicate restrictions on elements extraposed from subject NPs (SXs).

The purpose of this paper is to reformulate Furukawa 1991 within the Minimalist framework (Chomsky 1992, 1994, and 1995, among others) with some modifications, and to show that some marked properties of extraposition can follow naturally from the Minimalist framework.

1. Movement Analyses

Movement analyses of extraposition inherently pose several problems, as discussed in Furukawa 1994. Let us briefly review them.

First, optionality of extraposition must be accounted for. If extraposition is a movement operation, there should be a strong feature

to drive overt movement within the Minimalist framework, but there is none.[1)]

Second, if extraposition is a movement operation, specifically, an adjunction operation, why is successive adjunction barred in case of extraposition? We need an additional mechanism that determines the landing site of EXs.[2)]

Third, under certain circumstances, the Subject condition is violable in case of PP extraposition. Furukawa 1991 has dealt with this problem, on the lines of Johnson 1985, who claims that PP extraposition is a movement operation while relative clause extraposition is not, but licensed by Predication.

The first two conceptual problems could be solved if we adopt the proposals of Fukui 1993 and Nakajima 1989, among others.[3)]

The third problem above is dealt with in Furukawa 1991 with LF reconstruction.

2. A Reconstruction Analysis

Next, let us go on to consider how the reconstruction analysis works.

2.1. Predicate Restrictions on SXs

Johnson 1985 first notes that the PP extraposition from subject NPs is allowed only in case of derived subjects, such as those of passives, unaccusatives, and psych-predicates.[4)]

(3) a. A child was seen with a yo-yo.
    b. A man entered with green eyes.
    c. A woman walked in with a scarlet carnation.
    d. Books impressed me about Nicaragua's struggle.

(4) a. *A man died with blue eyes.
    b. *A man ate the oranges with green eyes.

c. *A woman left the room with green eyes.

d. *A child screamed with green eyes.

To explain the predicate restrictions on SX, Furukawa 1991 has put forward the following derivation under the unaccusative hypothesis: First, SX is extracted from derived subject at its base-position by Move, as indicated in (5 a), and then, NP-movement applies to this structure, yielding (5 b). At LF, by virtue of reconstruction, the subject NP is moved back to its base-position to escape from ECP violation, since at S-structure, the subject NP is not L-marked, hence a barrier for movement and government under Chomsky 1986.[5)]

(5) a. $[_S e\ [_{VP}$ appeared $[_{NP}$ a man $t_i]]$ $[$with long hair$]_i]$

extraposition

b. $[_S\ [$a man $t_i]_j\ [_{VP}$ appeared $t_j]\ [$with long hair$]_i]$

NP-movement

c. $[_S\ e\ [_{VP}$ appeared $[_{NP}$ a man $t_i]]\ [$with long hair$]_i]$

reconstruction antecedent-government

2.2. A-Movement and Reconstruction

However, this analysis also raises some problems.

Reconstruction is a curious process, in that this process returns an overtly moved element to its base-position; thus, two instances of Move, overt raising and covert lowering, are involved in reconstruction. Therefore, to eliminate the reconstruction, Chomsky 1992 proposes the copy theory of movement; the trace left behind by Move is a copy of the moved element, and the copy can remain at LF but must be deleted at

PF; thus, the reconstruction process need not be postulated at LF. However, Chomsky 1992, 1994 and 1995 assume that reconstruction is a reflex of the operator-variable formation, restricting the process to the special case of A'-chains that involves operators. The trace left by A-movement is not a copy,or even if it is, it is deleted at LF component before the binding theory applies. On the other hand, A'-movement leaves a copy, which can remain at LF.

In fact, Chomsky 1992, 1994 and 1995 present some evidence against the reconstruction of A-movement:

(6) The claim that $John_i$ was asleep seems to him_i [*t* to be correct].
(7) *I seem to him_i [*t* to like $John_i$].

As you can see, *him* can bind *John* in (7); (7) violates Condition C of the binding theory. If there were a copy left behind by A-movement, then *him* could bind *John* in (6), since *t* in the embedded sentence is the copy of the matrix subject, and thus it is wrongly predicted that the binding theory rules out (6).[6]

Simple passive sentences pose a problem of the copy theory of A-movement in light of the binding theory.

(8) a. He was hit. → He was hit [$_{COPY}$ *he*].
b. John was kicked. → John was kicked [$_{COPY}$ *John*].

If the traces left by passives are copies, then (8 a) and (8 b) violate Condition B and C of the binding theory, respectively.

However, there is some evidence in favor of the reconstruction of A-movement.

The raising construction also exhibits the reconstruction effects.

(9) a. [Replicants of themselves$_i$]$_j$ seemed to the boys$_i$ [t_j to be ugly].
b. [Friends of each other$_i$]$_j$ seem to [John and Mary]$_i$ [t_j to be nice].
c. [Friends of each other$_i$]$_j$ seemed [t_j to amuse the men$_i$].

(10) a. *[Replicants of themselves$_i$]$_j$ promised the boys$_i$ [PRO$_j$ to become ugly].
b. *[Friends of each other$_i$]$_j$ wanted [PRO$_j$ to amuse them$_i$].

The matrix subjects containing anaphors should be reconstructed; thus, A-movement also leaves a copy of the moved NP at LF.

Rizzi 1990 shows that the asymmetry of deep vs. derived subjects in terms of French pronominal clitic *en* is attributed to reconstruction. Consider the following contrast:

(11) a. [La premiére partie t_i]$_j$ en$_i$ a été publiée t_j en 1985.
'The first part of-it has been published in 1985.'
b. *[La premiére partie t_i] en$_i$ montre que...].
'The first part of-it shows that ....' (Rizzi 1990: 37)

As in the case of extraposition, only the derived subject allows the cliticization, and hence given the LF reconstruction in (11 a), it follows that, unlike (11 b), *en*$_i$ can c-command the matrix subject containing t_i in the base position at LF. This analysis supports our analysis of PP extraposition as well as the claim that A-movement also leaves a copy.

Furthermore, psych-predicates exhibit the reconstruction effects to "object" positions if the analysis proposed by Belletti and Rizzi 1988 is correct.

(12) a. The picture of himself$_i$ in the musium bothered John$_i$.

b. Stories about each other$_i$ frighten [John and Mary]$_i$.

In Belletti and Rizzi 1988, it is assumed that Condition A of the binding theory is an anywhere condition: it holds at D-structure or at S-structure. If *John* is structurally higher than the anaphor in (12 a) at D-structure, it can bind the anaphor. The Minimalist framework (Chomsky 1992, among others), however, assumes that the binding conditions hold only at LF interface, since D-structure and S-structure are dispensed with. Therefore, it could be concluded that the matrix subject has its copy in a position structurally lower than *John* in (12 a) at LF if we assume a copy in the object position.[7)]

Under the copy theory of movement, how can we explain the data presented against the claim that A-movement leaves a copy?

Let us explore the behavior of raising and control structures in light of scope ambiguity to motivate the claim that A-movement leaves behind a copy in its trace position.

May 1985 observes scope ambiguities in raising constructions. Consider the following example.

(13) A hippogryph is likely to be apprehended.

The quantified NP in (13) can be understood as having narrow or broad scope with regard to the predicate. Thus, the sentence is roughly interpreted as follows:

(14) a. There is a hippogryph which is likely to be apprehended.

b. It is likely that a hippogryph will be apprehended.

May 1985 argues that the scope ambiguity in question is due to the different LF representations, derived by either quantifier raising or lowering.

(15) a. A hippogryph$_i$ [t_i is likely [t_i to be apprehended]].

b. t_i is likely [a hippogryph$_i$ [t_i to be apprehended]].

However, in the Minimalist framework, it is assumed that movement is a last resort operation driven by some feature. In this respect, it seems that this quantifier movement is not forced by any features at LF.[8] If LF quantifier movement is not allowed, how can we explain scope phenomena ?

Note that in control structures such as (16) quantified NPs only allow broad scope over the predicate.

(16) a. A hippogryph is anxious to be apprehended.

b. Some agent tried to be a spy for the other side.

Why is LF lowering is barred in (16)? The contrast between (13) and (16) can be captured if we assume copies left behind by A-movement. Consider the following examples:

(17) a. It is likely that Philip is a spy.

b. *It is anxious that Philip is a spy.

(18) a. Philip$_i$ is likely [t_i to be a spy].

b. Philip$_i$ is anxious [PRO$_i$ to be a spy].

Matrix subjects of the control structures like (16) are not raised from

the embedded sentences by A-movement, as you can see in (17 b); hence, the unambiguous nature of control structures with regard to the predicate can be ascribed to the fact that there is no copy of the matrix subject left in the embedded clauses, as in (18 b). It follows, then, that scope of quantification is not determined by quantifier movement but copies involved.

Several additional assumptions are necessary to explain the whole range of quantifier scope phenomena, but we only consider some notions directly relevant to our discussion.

Following Hornstein 1995, we assume the following generalization deducible from the principle fo Full Interpretation (FI).[9]

(19) At the Conceptual-Intentional (CI) interface, an A-chain has at most one and at least one lexical link. (Hornstein 1995: 154)

Accordingly, Hornstein 1995 assumes that any member (copy) of an A -chain can be freely deleted as long as Diesing's 1992 Mapping Hypothesis stated in (20) is respected; hence, all but one must be deleted at LF.

(20) A definite argument must be outside the VP shell at the CI interface. (Hornstein 1995: 155)

If there is more than one quantifier, relative scope of quantifier scope is determined at LF in terms of c-command.

(21) A quantified argument Q_1 takes scope over quantified argument Q_2 iff Q_1 c-commands Q_2 (and Q_2 does not c-command Q_1). (Hornstein 1995: 154)

To recapitulate, we have argued that to accomodate the copy theory of movement to reconstruction effects in constructions where A-movement is involved, A-movement leaves a copy in its trace position as well as A'-movement (contra Chomsky), with copies freely deleted by the requirements stated in (19) and (20). Therefore, SXs can be treated on a par with elements extraposed from object NPs (OXs).

2.3. Countercyclic Movement

If extraposition from derived subject NPs is possible, as in (3), why is *wh*-extraction from derived subjects precluded? Consider the following example:

(22) *Who$_i$ was [a picture of t_i]$_j$ taken t_j by Bill?

Examples like (22) are ruled out by the extention requirement assumed in Chomsky 1992, or other economy principles, proposed by Collins 1994 and Kitahara 1994 b, among others, so as to eliminate the extention requirement.[10] However, proposals like these would wrongly predict that extraposition from subject NPs is also disallowed under the movement analyses. See Furukawa 1994 for relevant discussions

3. A Minimalist Approach to PP Extraposition

In Furukawa 1994, we have argued that, as long as Predication is respected, so-called extraposed relative clauses should be freely introduced by Merge, which is not an operation triggered by some strong features, thus optional. On the basis of argument-adjunct asymmetries in binding phenomena, why is it not possible that Merge introduces PPs to a position external to their head NPs, if we assume that extraposed PPs, like relative clauses, are adjuncts, not complements to their heads ?

(23) a. Which claim that John$_i$ made did he$_i$ later deny *t*?
b. *Whose claim that John$_i$ likes Mary did he$_i$ deny *t*?
(Lebeaux 1990:320)

(24) Which pictures near John$_i$ does he$_i$ like *t*? (*ibid.*)

3.1. Merge or Move, or Both ?

Suppose then that Merge introduces extraposed PPs to their appropriate adjunction sites during the derivation, as in the case of the relative clause extraposition.[11] It follows that optionality of extraposition and the Chomsky-Collins paradox can be explained, since Merge *per se* is optional and PPs are not extraposed by Move. Furthermore, to account for the differences between PP extraposition and relative clause extraposition,[12] we propose that the PP covertly move to its head NP, in case of PP extraposition, adopting the following version of Move, proposed by Takahashi 1995.

(25) Move α is to a position that either c-commands α or is c-commanded by α.

(26) *John asked t_i [$_{CP}$ who$_i$ C [$_{IP}$ Mary left]].

Consequently, lowering is allowed in principle. Examples like (26) are ruled out by virtue of the ban against vacuous quantification or free variable, as Lasnik and Saito 1992 point out.

Suppose further that in case of an extraposed form like the data (27), formal feature of the extraposed PP is weak, and that the EX is, then, forced to covertly lower to its head NP by the principle of FI, or otherwise, the derivation will crash. Nonextraposed PP as in the case of (28) is introduced by Merge but Move is not involved.

(27) A woman appeared with short hair.

(28) A woman with short hair appeared.

Then we have the following derivation of PP extraposition.[13)]

(29) a. $[_{VP}$ appeared a man$]$.

b. $[_{IP}$ A man $[_{VP}$ appeared $[_{copy}$ a man$]]]$.

c. $[_{IP}$ A man $[_{VP}$ appeared $t_i]$[with short hair]].

d. $[_{IP}$ (A man) $[_{VP}$ appeared [a man][with short hair]$_i$] ([with short hair]$_i$)].

Under the unaccusative hypothesis, *a woman* is introduced to the sister position of *appeared* in (29 a), and subsequently raised to the subject position, leaving behind a copy in (29 b). PF deletion applies to (29 b), and *with short hair,* the extraposed PP, is introduced countercyclically, yielding (29 c). Under the copy theory, LF movement and LF deletion yield (29 d) as a possible LF representation which is basically the same as the case of PP extraposition from object NPs or non-extraposed forms.

3.2. Boundedness of Extraposition

The next question to ask is how this analysis can capture the boundedness of extraposition. We argue that the boundedness follows from Chomsky's economy principle, Minimal Link Condition (MLC). MLC is defined in terms of the following notions:

(30) a. The category α dominates β if every segment of α dominates β.

b. The category α contains β if some segment of α dominates β.

(Chomsky 1992: 15)

(31) Max (α) is the least full category maximal projection dominating α. (*ibid.*)

(32) For any X^0-chain CH (α_1,..., α_n);

a. the domain of CH = the set of nodes (i.e. categories) contained in Max (α_1) that are distinct from and do not contain any α_i.

b. the minimal domain of CH =
the smallest subset K of the domain of CH such that for any $\Gamma \epsilon$ the domain of CH, some $\beta \epsilon$ K reflexively dominates Γ.

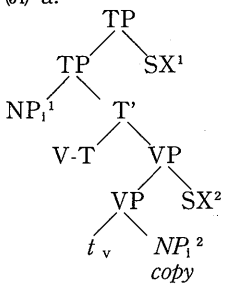
(Chomsky 1992: 16)

(33) MLC

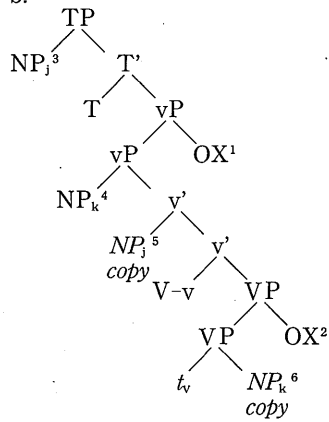
If α, β are in the same minimal domain, they are equidistant from γ. (Chomsky 1992: 24)

MLC roughly states that Move must attach α to the nearest target, which is defined in terms of equi-distance. Thus, if the extraposed element lowers to its head NP by Move at LF, then this LF lowering operation is subject to MLC; in other words, the extraposed element and its head NP are in the same minimal domain. Extraposed elements and thier head NPs in (34) are all in the minimal domains of CH (V), under the bare phrase structure theory adopted in Chomsky 1995.[14]

(34) a.



b.



MLC predicts that SXs adjoin to TP or VP, while OXs adjoin to VP, precisely the same as Rochemont and Culicover's 1990 observations.

3.3. Predicate Restrictions on SXs and Specificity Effects

However, this MLC approach cannot explain the fact that only derived subjects allow extraposition from subject NPs, since, for example, NP¹ and NP², in the same minimal domain, are both possible adjuction sites of EXs in (34 a). We must, therefore, restrict the relation between an extraposed element and its head NP so as to exlcude NPs in specifier positions (namely, NP¹, NP³, NP⁴, and NP⁵ in (34)) as a target of Move. One possible solution to this problem is to assume that targets of LF lowering must be elements in complement positions, extending Mahajan 1992, who attempts to derive the specificity effects from a condition like the Subject condition or the condition on extraction domain (CED).

(35) a. *Who did you see [the picture of *t*]?
b. *Who did John read [every story about *t*]?
c. *Who did Mary make [most movies about *t*]?
d. Who did you see [pictures of *t*]?

e. Who did Mary read [a story about *t*]?

f. Who did Mary make [many movies about *t*]?

(Mahajan 1992: 510)

On the basis of Hindi, Mahajan 1992 assumes that features of specific NPs are checked by a spec-head relation while features of nonspecific NPs are checked by a head-complement relation. Thus extraction out of specific NPs, which are assumed to be in specifier positions under Mahajan 1992, is ruled out by a condition like CED.[15]

PP extraposition also exhibits specificity effects.

(36) a. A review appeared of *The Joy of Cooking.*

b. Many reviews appeared of *The Joy of Cooking.*

c. *Every review appeared of *The Joy of Cooking.*

d. *Most reviews appeared of *The Joy of Cooking.*

(Diesing 1992: 134)

(37) a. *I remember John's friend yesterday [from Chicago].

b. *I ate every dish on Tuesday [from Cantor's].

(Johnson 1985: 102)

The copy theory of movement does not seem to capture the difference in acceptability with respect to specificity effects, provided that copies of A-movement are both left behind in their original positions: the base positions are the same, the complement positions to the Vs in (36) and (37), under the unaccusative hypothesis.[16] However, recall that we have assumed in 2.2. that under Diesing's 1992 Mapping Hypothesis, "reconstruction into VP-shells" is possible only if nonspecific NPs head A-chains, following Hornstein 1995. In (36 c, d) and (37), the copies of the head NPs in the VP complement positions must be deleted, violating

the CED; on the other hand, deletion of the nonspecific NPs is possible in the specifier positions in (36 a, b) under the Mapping Hypothesis, avoiding the CED violation.

3.4. VP Preposing

If our analysis is on the right track, it follows that SXs can adjoin to either TP or VP, as long as MLC holds and LF lowering targets NPs occupying complement positions.

Let us consider the VP-constituency test involving extraposition from subject NPs which apparently raises a problem to our analysis.

(38) a. ..., [$_{VP}$ appear], [$_{S}$ a man did t_{VP} [with long hair]].
b. *..., [$_{VP}$ appear][with long hair], [a man did t_{VP}].

Under the copy theory and the unaccusative hypothesis, examples like (38) are mapped to the following LF representaions like (39), respectively, assuming that EXs are counter-cyclically introduced as in the case of relative clause extraposition.

(39) a. ...([appear [$_{COPY}$ a man]])[(a man) did [$_{COPY}$ appear [$_{COPY}$ a man]][$_{EX}$ with long hair]].
b. *...[[appear [$_{COPY}$ a man][$_{EX}$ with long hair]][(a man) did [$_{COPY}$ appear [$_{COPY}$ a man]]].

We assume that as a requirement of the principle of FI, preposed elements must be deleted under identity by a condition like the Proper Binding condition or the Chain condition.[17] Thus, the preposed predicate in (39 a) is deleted under identity. In (39 b), on the other hand, the deletion under identity is barred, since lowering of EX into the matrix is not allowed by the definition of Move stated in (25).

4. Concluding Remarks

In this paper, we have shown that EXs are countercyclically introduced by Merge and that formal features of PPs force EXs to lower to their head NPs at LF. We have demonstrated that optionality and boundedness of extraposition can be naturally accounted for by Merge and MLC. We have uniformly dealt with the predicate restrictions on SXs and the specificity effects of PP extraposition, following Hornstein 1995 and Mahajan 1992.

We have not treated interactions of PP and relative clause extraposition and secondary predicates, as discussed in Rochmont and Culicover 1990 and Nakajima 1992.

Further research will be required to complete our research.

Notes

1) See Kaan 1992 for further discussion.
2) For boundedness of rightward movement, see Johnson 1985, Nakajima 1989, Suzuki 1995 and Kayne 1993, 1995, among others.
3) For optionality of extraposition, see Fukui 1993, who proposes the parameter value preservation measure to account for optional movement in general, such as Japanese scrambling and English rightward movement within the framework of the Minimalist Program. For boundedness of extraposition, see Culicover and Rochemont 1990, Guéron 1980, Gûeron and May 1994, Rochemont and Culicover 1990, Kayne 1993, 1995, Nakajima 1989, Suzuki 1995, and Truckenbrodt 1995.
4) See Guéron 1980, Nakajima 1993, and Truckenbrodt 1995, among others, for alternative explanations of the contrast like (3) and (4). See also Levin and Rappaport Hovav 1995 for unaccusativity.
5) See Chomsky 1986 for relevant notions.
6) Copy theory of A-movement poses another problem. Consider the fol-

lowing LF representaion of a simple sentence assumed in the Minimalist framework:

(i) $[_{AGRSP}$ SUBJ $[_{TP}$ $[_{AGROP}$ OBJ $[_{VP}$ t_{SUBJ} V $t_{OBJ}]]]]$

Given the copy theory of movement, it would be expected that OBJ could bind SUBJ in (i), but this prediction is not born out.

(ii) a. *Replicants of themselves$_i$ criticized the girls$_i$.
b. *Each other$_i$'s friends hit them$_i$.

For possible solutions, see note 7) and discussion below.

7) On the basis of the fact that short scrambling in Korean and Japanese does not exhibit reconstruction effects, Lee 1995 assumes that theta-positions, as non-checking positions, are not represented at the LF interface. Thus copies in checking positions, including the subject positions of infinitival clauses, may remain, while copies in the other positions, such as VP-internal subject and object positions, may not. Therefore, this analysis can predicts that reconstruction to subject positions of infinitives is possible, whereas it is not to reconstruct moved elements to their traces of object positions in the case of passives and unacsussatives.

However, as we have seen, French cliticization, PP extraposition, and psych-predicates force reconstruction to the object position.

8) See Hornstein 1995 and Beghelli 1993 for discussion against quantifier movement.

9) See Hornstein 1995 for further motivation.

10) See Collins 1994, Chomsky 1994, 1995 and Kitahara 1994 b, among others for details of their prposals of economy of derivation.

11) Indeed, some PPs are complements to N, hence cyclically introduced by Merge. Note, furthermore, that extraposition does not seem to affect binding possibilities.

(i) a. ? They$_i$ said that a story appeared yesterday about themselves$_i$.
b. ? They$_i$ said that a story about themselves$_i$ appeared yesterday.
(Johnson 1995: 104)

(ii) a. *They$_i$ said that the woman walked in angry with themselves$_i$.
b. *They$_i$ said that the woman bought a dress for themselves$_i$.
(*ibid.*)

This contrast shows that extraposition is derived by Move, hence exhibits reconstruction effects. There seem to be several possible solutions to this problem, but we leave this question open.

12) See Johnson 1985 and Furukawa 1993.

13) For adjunction sites of EXs, see below. Parentheses here indicate deleted

items at LF, required by the principle of FI (19) and Mapping Hypothesis (20).

14) In Chomsky 1994 and 1995, different VP-structures between transitive and intransitive verbs are assumed. Chomsky 1995 adopts multiple specifiers and abolishes AGR-based Case-checking. See Chosmky 1995 and references cited there.

15) We need to reformulate the condition within the Minimalist framework. We leave this question open, since this issue is beyond the scope of this paper.

16) Given weak or strong features, D or N features of PPs can also capture the differences.

17) See Takano 1995 for an analysis of predicate fronting under the copy theory of movement.

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