

The Generalized Thematic Constraint on X-Shift*

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0. Introduction

The purpose of this paper is to propose a general principle that governs those phenomena relevant to rightward movement from postverbal position. We will call the principle the Generalized Thematic Constraint on X-Shift. By X-Shift, we mean, roughly, a rule which moves postverbal phrasal categories to the end of sentences. Thus, PP Shift and Heavy NP Shift will be taken to be special cases of X-Shift.

Before going directly into the issue of X-Shift itself, we will briefly see what PP and Heavy NP Shift are like in sections 1 and 2, respectively. Section 3 is concerned mainly with a certain thematic constraint on Heavy NP Shift, which, to our knowledge, was first put forth by Fukuchi (1977). In section 4, we will generalize this constraint to cover other cases of X-Shift, including PP Shift, and thus propose the Generalized Thematic Constraint, which will be shown to be borne out by ample evidence.

1. PP Shift

PP Shift is a rule which moves a postverbal PP complement to the end of a sentence, as in (1) and (2):

- (1) a. John gave the book to Mary yesterday.
b. John gave the book \emptyset yesterday to Mary.

- (2) a. I talked to Mary about those things yesterday.
 b. I talked \emptyset about those things yesterday to Mary.

As for the verbal expression in (2), i.e. talk to someone about something, where two PP complements are contained, previous analyses such as Postal (1971) and Berman (1973) treat the to-complement as always preceding the about-complement at D(eep)-structure. In the present discussion, however, we do not adopt this treatment; rather, we assume, following Stowell (1982) and Chomsky (1981), that PP complements are freely ordered at D-structure, and hence that the to-complement need not precede the about-complement at the D-structure of the verbal phrase in question. That is, the sequence talk about something to someone can appear in this order at D-structure, along with the one in the reverse order of the complements, as in (2a); and PP Shift may apply to either string, yielding opposite results.

2. Heavy NP Shift

Heavy NP Shift is a rule which moves so-called heavy NPs,¹ including complex NPs, to the end of sentences. More specifically, this rule relates the sentences in (3) to those in (4):

- (3) a. He attributed the fire which destroyed most of my faculty to a short circuit.
 b. I told those things which happened yesterday to Mary.
- (4) a. He attributed \emptyset to a short circuit the fire which destroyed most of my faculty.

- (4) b. I told \emptyset to Mary those things which happened
 yesterday.

Since Ross's (1967) pioneer work, however, it has often been argued that some constraint is needed to accommodate the fact that the postverbal NP in such a sentence as (5a) cannot be moved rightward, even if it is heavy enough:

- (5) a. I told a man who had a kind face that we were
 in trouble.
 b. *I told \emptyset that we were in trouble a man who had
 a kind face.

Notice that the constraint involved is not a syntactic one, since the derivational process of (5b) is virtually the same as that of the grammatical sentences in (3).

We will therefore explore the constraint on Heavy NP Shift from a semantic (or thematic) point of view, and generalize it to cover other rightward movement rules, including PP Shift.

3. A Thematic Constraint

Let us begin by observing the examples in (6), as compared with those in (7):²

- (6) a. I gave the girl who was studying linguistics
 a book yesterday.
 b. *I gave t a book yesterday the girl who was
studying linguistics.
 (7) a. I gave a book to the girl who was studying
 linguistics yesterday.

- (7) b. I gave a book t yesterday to the girl who was studying linguistics.

In (6), the postverbal NP, though heavy enough, cannot be moved rightward, but in (7), the corresponding PP can. The important point to note here is that while these sentences are different in syntactic structure, they describe the same situation, namely, change of possession of a book--or, in physical terms, motion of a book from the speaker to the girl who was studying linguistics.

As is well known, Jackendoff (1972; 1976) proposes a theory of thematic relations, in which the phrase denoting the moving object is defined as the Theme of the sentence, the phrase denoting the Theme's initial position as the Source, and the phrase denoting the Theme's final position as the Goal.

In terms of this theory of Jackendoff's, we can take the thematic roles of the three NPs contained in (6) and (7) as follows: a book is Theme, I is Source, and the girl who was studying linguistics is Goal.

If this is correct, then we may say, from the grammaticality difference between (6b) and (7b), that Heavy NP Shift, unlike PP Shift, cannot operate on the phrase functioning as Goal.

This observation is also true of the following examples:

- (8) a. I told a man who had a kind face about that trouble yesterday.
 b. *I told t about that trouble yesterday a man who had a kind face.
- (9) a. I talked to a man who had a kind face about that trouble yesterday.

- (9) b. I talked t about that trouble yesterday to a man who had a kind face.

Here again, the sentences in (8) and those in (9) are different in syntactic structure, but describe virtually the same situation, which might also be expressed--though at a quite abstract semantic level in this case--by a thematic relation in which the Theme moves from the Source to the Goal. Correspondingly, we might characterize the thematic roles of the NPs involved as follows: that trouble is Theme, I is Source, and a man who had a kind face is Goal. To the extent that this characterization is appropriate, we can account for the ungrammaticality of (8b) (and the grammaticality of (9b)) by saying, again, that Heavy NP Shift, unlike PP Shift, cannot operate on the phrase functioning as Goal.

By the same token, we can account for the ungrammaticality of sentence (5b), where the shifted NP is taken to be Goal. We note in passing that the Theme of (5b) is the complement clause that we were in trouble.

Let us now turn to the following examples:

- (10) a. I told those things which happened yesterday to Mary. (=3b)
 b. I told t to Mary those things which happened yesterday. (=4b)
- (11) a. I talked about those things which happened yesterday to Mary.
 b. I talked t to Mary about those things which happened yesterday.

These sentences are the same in choice of verbs as those in (8) and (9), respectively. But here not only (11b) but also

(10b) is grammatical. Comparing (10)-(11) with (8)-(9), we see that the difference between them lies in the thematic role of the shifted phrase: in (8)-(9), it is Goal, as we remarked above, but in (10)-(11), it can be regarded as Theme. This observation suggests that Heavy NP Shift as well as PP Shift can operate on the phrase functioning as Theme.

The same is also the case with the grammatical sentence (4a), which has undergone Heavy NP Shift. A little reflection tells us that the shifted NP in (4a), like that in (10b) (=4b)), functions as Theme.

Furthermore, in (12) as well, which is grammatical, the shifted NP assumes the role of Theme (cf. (6b)):

- (12) I gave t to Ann a copy of the book about thematic relations.

We have shown thus far that while PP Shift can operate on both the Theme and the Goal, Heavy NP Shift can operate on the Theme but not on the Goal.

We will go on to consider the applicability of these two roles to the phrase functioning as Source. Observe the following sentences:


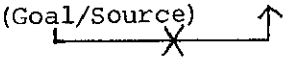
- (13) a. They robbed the bank over there of \$10,000.
 b. *They robbed t of \$10,000 the bank over there.
 (14) a. They walked from here to New York yesterday.
 b. They walked t to New York yesterday from here.

In (13), \$10,000 is Theme; the bank over there is Source. In (14), (to) New York is Goal; (from) here is Source. From the ungrammaticality of (13b) and the grammaticality of (14b), we may conclude that Heavy NP Shift, unlike PP Shift, cannot operate on the Source.

To recapitulate the discussion so far in this section, we have made it clear that Heavy NP Shift, but not PP Shift, is subject to a thematic constraint of this sort:

- (15) Heavy NP Shift may not apply unless the NP is Theme.

To the best of our knowledge, Fukuchi (1977) is the first to have taken notice of the effect of thematic relations on Heavy NP Shift and proposed such a constraint as (15); he formulates it in terms of the following diagrams:

- (16) a. X V NP Y
 (Theme) 
- b. X V NP Y
 (Goal/Source) 
- (Fukuchi, 1977, p. 8)

But we see at once that constraint (16) or (15) is at best of a descriptive character, because it merely describes the fact that Heavy NP Shift cannot operate on the Goal or the Source but only on the Theme; that is, it does not provide a principled explanation as to why this is so. Fukuchi (1977) does not go so far as to enter directly into this matter, although he discusses a functional motivation for (16) in terms of the notion "prominence".

Furthermore, Fukuchi's analysis is limited to Heavy NP Shift and is not concerned with PP Shift (or other rightward movement rules as we will observe them later). But these two rules are evidently of the same type in that both of them move certain postverbal phrasal categories to the end of sentences; therefore, they should be treated as such. In fact, such a treatment gives some clue to the question we

4. The Generalized Thematic Constraint on X-Shift

One way to approach the two questions posed above is by trying to explain constraint (15)=(16) itself in terms of a more general principle from which this constraint follows as a special case and which has other consequences as well.

For this purpose, we reduce PP and Heavy NP Shift to a single rule schema that may be called X-Shift, where X is a phrasal category. X-Shift is a rule which moves a post-verbal X-complement rightward and Chomsky-adjoins it to the S that immediately dominates the VP:

(18) X-Shift:

$$[S \dots [_{VP} V \dots X \dots] \dots] \Rightarrow [S [S \dots [_{VP} V \dots \underline{t \dots}] \dots] X]$$

Thus, the difference between PP and Heavy NP Shift is reducible just to the difference in the category name of X.

We note incidentally that in the case of Heavy NP Shift, the category name of X is simply "NP" rather than "heavy NP", partly because it is very difficult--and we think, even impossible--to regard heavy NP as an independent phrasal category and partly because the concept "heaviness" may pertain to discourse grammar, not sentence grammar. In fact, it is not implausible to assume that the rule of X-Shift itself is generally immune from a constraint to the effect that when X is an NP, this NP must be heavy enough in a certain sense, since it is preferable from a conceptual point of view to distinguish such a constraint from, say, the one given in (15) or (16). For convenience' sake, however, we will continue to use the term "Heavy NP Shift".

Note also that our formulation of X-Shift in principle allows X to be a category other than PP or NP. We will return to this matter later.

It should be observed now that since phrasal category X is by definition a complement of a verb, it must have a certain thematic relation to the verb, even though it is shifted to be out of the VP domain; that is, shifted X must preserve the thematic relation.

On the basis of this observation, we propose a principle that appeals to the concept of "the recoverability of thematic relations.":

(19) The Generalized Thematic Constraint on X-Shift:

The rule of X-Shift, where X is a phrasal category, may not move the constituent X rightward unless the thematic relation of X to the verb associated with it is recoverable.

Underlying this is the idea--which seems not unreasonable--that movement rules subject to a thematic constraint affect the recoverability of thematic relations, so that phrases moved by those rules may not preserve their originally assigned thematic relations in the thematic representation of sentences. This, we believe, might be the case with rightward movement rules in general, that is, not only rules of X-Shift but Subject-NP Postposing, which Iwasawa (1982) shows is also thematically constrained.

We are now in a position to answer the question why PP-Shift is not thematically constrained. If the Generalized Thematic Constraint (19) is correct, it follows that PP-Shift is not thematically constrained because the thematic relation

of a shifted PP, whatever it may be, is always recoverable. In effect, it is because of the presence of a preposition that its thematic relation is recoverable, since prepositions can always represent thematic relations in the most explicit way and hence the thematic relation of PP complements is not affected at all, wherever they may appear.

Let us next turn to the question why Heavy NP Shift can operate on the Theme but not on the Goal or the Source. Here again, if the Generalized Thematic Constraint is correct, it follows that the NP functioning as Theme can be shifted because even if this NP has been shifted, its thematic role as Theme is necessarily recoverable. This is true in the sense in which there must be at least a Theme in the thematic representation of every sentence (cf. Jackendoff (1972: 1976)); that is, the Theme is obligatorily required there, so that its recoverability is always guaranteed, wherever the NP may appear.

On the other hand, we can say, in terms of the Generalized Thematic Constraint, that the NP functioning as Goal or Source cannot be shifted because once it has been shifted, its thematic role as Goal or Source is no longer recoverable, in the sense in which the Goal and the Source, unlike the Theme, are not necessarily obligatory elements required in the thematic representation of a sentence. In fact, it is only by virtue of the structural property of its base-generated syntactic position (i.e. position immediately following a verb) that the NP functioning as Goal or Source is assigned such a thematic relation; it thus follows, naturally, that once this NP has been shifted to a sentence-final non-base-generated position, its thematic relation as Goal

or Source is no longer recoverable. This, we believe, is exactly the reason why Heavy NP Shift cannot operate on the Goal or the Source.

In sum, the concept of "recoverability (of thematic relations)" used in (19) can be characterized as follows:

(20) In the structure to which X-Shift has applied (cf. (18)), the thematic relation of shifted X to the verb is recoverable if and only if

(i) or (ii):

(i) The head of X is a preposition (because prepositions can represent thematic relations explicitly).

(ii) X functions as Theme (because there must be a Theme in the thematic representation of every sentence).

Now we would like to enumerate a number of interesting consequences that can be drawn from the Generalized Thematic Constraint (19), by way of showing that this constraint, as opposed to constraint (15)(=(16)), does provide a principled basis for explaining those phenomena relevant to rightward movement from postverbal position.

First, we can derive constraint (15) from the Generalized Thematic Constraint: the former is a special case of the latter in which X is specified as (heavy) NP and must meet the recoverability condition (20ii).

Second, the Generalized Thematic Constraint, unlike constraint (15), explains why Heavy NP Shift can operate only on the Theme but not on the Goal or the Source (i.e. the first of the two questions posed in the preceding section):

Heavy NP Shift is a special case of X-Shift in which X is specified as (heavy) NP and which violates the Generalized Thematic Constraint unless shifted X meets the recoverability condition (20ii).

Third, the Generalized Thematic Constraint also explains why PP Shift is not thematically constrained: PP Shift is a special case of X-Shift in which X is specified as PP and which always observes the Generalized Thematic Constraint because of the recoverability condition (20ii).

Fourth, putting together the second and third points just made, we can explain why it is that Heavy NP Shift is thematically constrained, but not PP Shift (i.e. the second of the two questions raised in the preceding section): this asymmetry is reducible to the asymmetry in the recoverability of the thematic relation of shifted X, as is shown in (20).

So far, we have confined ourselves to assuming the category X in X-Shift to be either PP or NP. However, as we noted earlier, our formulation of X-Shift in principle allows X to be a category other than PP or NP. With this in mind, let us go on.

Fifth, the Generalized Thematic Constraint predicts that there is no rule like "AP-Shift". According to Jackendoff (1972, p. 31-32), adjectives can function as either "abstract" Location or Source or Goal, though not as Theme. For example, by analogy with the sentences in (21), where the PPs represent a "physical" Location or Goal, we can say that the AP in (22a) is Location and those in (22b, c) are Goals:

- (21) a. John was in New York last night.
 b. Bill got to New York yesterday.

(21) c. Tom threw a kiss to the girl of five years
twice yesterday.

(22) a. John was very angry last night.

b. Bill got very angry yesterday.

c. That made her very happy twice yesterday.

Suppose now that there is a rule like "AP-Shift". Then, this rule would be taken to be a special case of X-Shift in which X is specified as AP and which violates the Generalized Thematic Constraint unless shifted X meets the recoverability condition (20ii). Bearing this in mind, observe the sentences in (24) as against those in (23):

(23) a. John was t last night in New York.

b. Bill got t yesterday to New York.

c. Tom threw a kiss t twice yesterday to the girl of five years.

(24) a. ??John was t last night very angry.

b. ??Bill got t yesterday very angry.

c. *That made her t twice yesterday very happy.

The sentences in (23), which have undergone PP-Shift, are grammatical for the reason now familiar to us. On the other hand, the sentences in (24), which have undergone "AP-Shift", are ungrammatical because of their violation of the Generalized Thematic Constraint; that is, since the shifted APs in (24) function as Location or Goal, they do not satisfy the recoverability condition (20). If there were a rule like "AP-Shift", the Generalized Thematic Constraint, together with the recoverability condition (20), would allow the rule to apply if and only if the AP functions as Theme. But actually, APs cannot function as Theme, as we mentioned above.

It thus follows that there is no rule like "AP-Shift".

Needless to say, the grammar of English must preclude such sentences as those in (24) in one way or another. To our knowledge, however, no principle was proposed in the past which, as it were, could do this job. We conclude, therefore, that it is only by appealing to our Generalized Thematic Constraint that we can rule out sentences like those in (24), thus explaining the contrast in grammaticality between (23) and (24).

Sixth, the Generalized Thematic Constraint predicts that even a postverbal \bar{S} complement can be moved rightward if and only if it functions as Theme; in this case, the relevant rule is a special case of X-Shift in which X is specified as \bar{S} and which violates the Generalized Thematic Constraint unless shifted X satisfies the recoverability condition (20ii). Consider the following examples, where each underlined \bar{S} complement is moved from the position preceded by the verb to the sentence-final position:³

- (25) a. They made t clear that John was a spy.
 b. I took t for granted that you would come to the party.

Here the \bar{S} complements both can be taken to be Themes, with the phrases clear and for granted as "abstract" Goals, respectively. In terms of the Generalized Thematic Constraint, then, we may conclude that these sentences are grammatical because the shifted \bar{S} , in both cases, functions as Theme and hence satisfies the recoverability condition (20ii).

Finally, there might remain a possibility that the category X is specified as VP (or \overline{VP}). This possibility, however,

would be relevant only when one follows the \overline{VP} -analysis of infinitives (cf. Bresnan (1978)), in terms of which the infinitival complements in (26), for example, are taken to be \overline{VP} s rather than \overline{S} s:

- (26) a. Bill tried to climb that tree.
 b. I wanted to win the race.

In contrast, under the \overline{S} -analysis (cf. Chomsky (1981) and Koster and May (1982)), which assumes that all infinitives are \overline{S} s, the complements in (26) are taken to be \overline{S} s; in this case, the possibility that X is specified as \overline{VP} would be excluded on independent grounds. Thus, according as we adopt the \overline{VP} -analysis of the \overline{S} -analysis, we may think of the following sentences as instances of \overline{VP} -Shift or \overline{S} -Shift:

- (27) a. Bill tried t very hard to climb that tree.
 b. I wanted t very much to win the race.

In any case, the important point here is that the Generalized Thematic Constraint predicts that postverbal infinitival complements can be moved rightward if and only if they function as Theme, irrespective of whether they are regarded as \overline{VP} s or \overline{S} s. In terms of the Generalized Thematic Constraint, therefore, we may say that such sentences as those in (27) are grammatical because the shifted infinitival complement functions as Theme and hence satisfies the recoverability condition (20ii).

To summarize the discussion on this section, we have demonstrated, by presenting ample evidence, that the Generalized Thematic Constraint on X-Shift (19), which makes use of the notion "the recoverability of thematic relations", provides a principled explanation for those phenomena rel-

evant to rightward movement from postverbal position, thus revealing a linguistically significant generalization.

Still a few questions might remain. For example, is it possible to reduce the Generalized Thematic Constraint itself to a much deeper principle of grammar that has more far-reaching effects? Or what influence, if any, does the notion of the recoverability of thematic relations have on the Projection Principle proposed by Chomsky (1981; 1982)? Or is there any connection between the recoverability of thematic relations and the so-called recoverability of deletion? Although it may be worth while to consider these questions, it is beyond the scope of our present discussion and so we leave all of them open.

NOTES

* This is a slightly revised and abridged version of a paper read at the Third Annual Meeting of the Tsukuba English Linguistic Society on November 14, 1982. Although the original version contained a number of arguments that what we will refer to here as X-Shift is a stylistic rule rather than a transformational rule in the strict sense of the term, yet we have decided, for the sake of consistency and conciseness, not to incorporate them into the present version. We wish to thank Minoru Yasui, Minoru Nakau, Shosuke Haraguchi, Masaki Sano, Katsuhiko Iwasawa, and many others for important comments and suggestions.

¹ The "heaviness" of an NP might be defined in terms of its length, stress, and so on. At present, however, we do not have any good idea about its proper definition. In any

case, as we will see later in section 4, our treatment of Heavy NP Shift does not depend upon the concept of "heaviness".

² Hereafter, \bar{t} represents the trace of a moved constituent.

³ These sentences should not be confused with those in which \bar{S} complements are "extraposed":

- (i) They made it clear that John was a spy.
- (ii) I took it for granted that you would come to the party.

These cases should be dealt with in a different way, since they do not fall under X-Shift.

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