

A Semantic Constraint on Extraction  
out of Noun Phrases\*

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0. Since the late 1960's, linguists concerned with the theory of transformational grammar have studied and discussed the problem of what constitutes conditions or constraints on transformations, because of the fact that transformations, which, if not constrained at all, would be extremely powerful, must be constrained in power in one way or another. What have so far been proposed as such constraints may be divided largely into two types: one is syntactic and the other semantic (or pragmatic, in a certain sense).<sup>1</sup>

In this line of inquiry, I will attempt here to propose what seems to be considered a semantic constraint on transformations--more specifically, a semantic constraint involved in extraction out of noun phrases of the form (1) in Japanese and English.

(1) [<sub>NP<sub>0</sub></sub> NP<sub>1</sub> P NP<sub>2</sub>]

(P represents the particle no in Japanese or a preposition in English.)

1. Let us begin by observing the following pair of sentences:

(2) a. Zoo wa hana ga nagai.

elephant THEME nose NOM long

"As for an elephant, its nose is long."

b. Zoo no hana wa nagai.

GEN

"An elephant's nose is long."

In (2a), as is well known, the particle wa serves the function of the particle no as well (cf. Mikami (1960)); that is, (2a) is cognitively synonymous with (2b). On the other hand, the two sentences differ in the thematized NP: the theme of (2a) is zoo while that of (2b) is zoo no hana.

According to Kuno's (1973, ch. 3) analysis, this fact can be accounted for in the following way. First, suppose that the sentences in (2) have the same deep structure (3):

(3) [<sub>S</sub>{<sub>NP</sub> Zoo no hana} nagai].

Subject Marking applies to this structure, attaching ga to zoo no hana:

(4) Zoo no hana ga nagai.

(4) is then subject to Thematization, which is formulated by Kuno as follows:

(5) Thematization [optional]:

Add wa to an NP+particle, and prepose the NP+particle +wa to the beginning of the sentence (Kuno, 1973, p. 71).

In (4), if zoo no is thematized, (6a) is yielded; if zoo no hana ga is thematized, (6b) is yielded.

(6) a. Zoo no wa hana ga nagai.

b. Zoo no hana ga wa nagai.

Since wa can serve the function of ga as well as that of no (cf. Mikami (1960)), the particle preceding wa in (6) is deleted. Then, (2a) derives from (6a) and (2b) from (6b). Thus, the cognitive synonymy between the sentences in (2) is accounted for by the identity of their deep structures, their

difference is accounted for by the fact that the underlying structure (4), an input to Thematization, can be properly analyzed in two ways with respect to the rule.

We now generalize constructions (2a) and (2b) as in (7):

- (7) a. NP<sub>1</sub> wa NP<sub>2</sub> ga ...  
 b. [<sub>NP<sub>0</sub></sub> NP<sub>1</sub> no NP<sub>2</sub>] wa ...

Comparing these two constructions, we see from the following examples that (7a) is more restricted than (7b):

- (8) a. Taroo wa atama ga ookii.  
                   head       big  
           "As for Taroo, his head is big."  
 b. Taroo no atama wa ookii.  
           "Taroo's head is big."
- (9) a. \*Taroo wa kyabetu ga ookii.<sup>2</sup>  
                   cabbage  
           "As for Taroo, his cabbage is big."  
 b. Taroo no kyabetu wa ookii.  
           "Taroo's cabbage is big."
- (10) a. \*Taroo wa inu ga ookii.  
                   dog  
           "As for Taroo, his dog is big."  
 b. Taroo no inu wa ookii.  
           "Taroo's dog is big."

Kuno (1973) says that "it is not clear what types of NP's can be made themes and what types cannot be" (p. 71, n. 7), and presents no principle that explains the ungrammaticality of (9a) and (10a).

According to Onoe (1977), what has been thought of hitherto as explaining the ungrammaticality of such sentences



- b. Taroo no aiken wa kuruma ni hikareta sooda.  
 "I hear Taroo's pet dog was run over by a car."
- (13) a. \*Taroo wa inu ga kuruma ni hikareta sooda.  
           dog  
 "As for Taroo, I hear his pet dog was run over  
 by a car."
- b. Taroo no inu wa kuruma ni hikareta sooda.  
 "I hear Taroo's dog was run over by a car."

What is interesting here is the difference in grammaticality between (12a) and (13a). We have to explain why this difference is brought about by the replacement of inu with aiken.<sup>4</sup> In this connection, we should bear in mind that the relation between Taroo and aiken is close, in a certain sense, to that between Taroo and otoosan. In what follows, I will discuss how to solve these two problems.

With regard to the first problem, we may take advantage of Kuno's transformational analysis mentioned above. Recall that to derive sentences of the form (7a) or (7b), we apply the rule of Thematization in (5) to the following structure (cf. (4)):

- (14) [<sub>NP<sub>0</sub></sub> NP<sub>1</sub> no NP<sub>2</sub>] ga ...

Kuno (1973) formulates Thematization as a movement rule that preposes a certain constituent to sentence-initial position. The thematization involved in construction (7a) can be regarded as the operation of extracting NP<sub>1</sub>+no out of NP<sub>0</sub> in (14); the thematization involved in construction (7b) is concerned with NP<sub>0</sub> as a whole and has nothing to do with extraction out of it.

With this consideration in mind, I now propose that the condition of whole-part relation not be imposed on the structure

in (7a) as before, but on extraction out of  $NP_0$ . Then, it is automatically explained why that condition holds in construction (7a), but not in construction (7b). Furthermore, since it is generally known that extraction out of certain syntactic domains in general must be restricted in one way or another,<sup>5</sup> my proposal here is not of a novel sort in the least.

This is my solution to the first problem, and it seems to me very persuasive.

Let us turn to the second problem. In considering this problem, we should keep in mind that we cannot reject the traditional notion of whole-part relation as totally insignificant and useless; although this notion is not sufficient to account for the grammaticality of (11a) and (12a), yet it serves well to account for the ungrammaticality of (9a), (10a), and (13a). Therefore, we ought to think of a more comprehensive (semantic) notion which may include not only the whole-part relation but also the relation between Taroo and otoosan in (11) and that between Taroo and aiken in (12).

What seems to me appropriate as such a notion is the notion of "inalienable possession".<sup>6</sup> Taroo and otoosan have a son-father relationship--more generally, a child-parent relationship--which is by nature inalienable. The relation between Taroo and aiken, as noted above, is close to that between Taroo and otoosan, in a certain sense. Our use of the word aiken in place of inu may imply conventionally that its referent is too favored and too much loved to be alienated; so we can say that aiken has an inalienable relation to Taroo. Furthermore, the whole-part relation as well seems to be included in the inalienable relation. To the extent that removal of a part of something makes the whole unviable, that

part is generally unseparable; in this sense, we can say that a part of something is inalienable for the whole. The relation between a body and a part of it is a case in point (cf. (2) and (8)): it is normally impossible to alienate a part of one's body. Thus, NP<sub>1</sub> and NP<sub>2</sub> in (2), (8), (11), and (12) intrinsically have an inalienable relation.

On the other hand, Taroo and kyabetu in (9) do not have such a relation any more than Taroo and inu in (10) and (13): kyabetu and inu are by no means necessarily connected with Taroo, and hence they have an alienable relation to it.

At this point, the reader may notice that I am using the term "inalienable" in a broader sense than it has been generally conceived of. Moreover, I am referring to "inalienable relation" rather than "inalienable possession". So for the purposes of the present discussion, I would better define the notion "inalienable relation" more clearly in my own terms. Strictly speaking:

- (15) X and Y have an inalienable relation if and only if the existence of either X or Y necessarily implies the existence of the other; otherwise, X and Y have an alienable relation.

The inalienable relation as defined this way is a kind of "implicational relation", so to speak.

Even in terms of this definition, Taroo and otoosan have an inalienable relation because Taroo's existence necessarily implies his father's existence, whether he is already dead or not. (Or the existence of one who is called otoosan necessarily implies that he has at least one child, who is called Taroo, in this case.) The same is true of the relation between

Taroo and aiken: the existence of a pet dog necessarily implies that of one who loves it (i.e. Taroo, in this case). Similarly, a part and its whole have an inalienable relation, since the former's existence necessarily implies the latter's existence and vice versa. In contrast, it is clear that there is no inalienable relation between Taroo and kyabetu in (9) nor between Taroo and inu in (10) and (13): Taroo's existence does not necessarily imply the existence of cabbage or a dog, nor vice versa.

I have argued, with respect to the second problem, that the notion of inalienable relation is more pertinent than the notion of whole-part relation.

To summarize what I have discussed so far, we should place the following semantic constraint on extraction out of noun phrases:

- (16) No element which is within the noun phrase structure  $[_{NP_0} NP_1 \text{ no } NP_2]$  can be extracted out of  $NP_0$  by a transformation if  $NP_1$  and  $NP_2$  intrinsically have no inalienable relation.<sup>7</sup>

By virtue of this constraint, we can explain simply the fact that while the (a) and (b) sentences in (2), (8), (11), and (12) are both grammatical, those in (9), (10), and (13) differ in grammaticality: (9a), (10a), and (13a) violate the constraint in (16).

The notion of possession when we speak of inalienable possession may well apply to not only concrete but abstract things. For example, human beings have a variety of abilities, characters, and so on, which obviously are inalienable. Then, thematization of Taroo in (17) should not violate the constraint

in (16).

(17) a. Taroo no eigo wa subarasii.<sup>8</sup>

English excellent

"Taroo's English is excellent."

b. Taroo no sunaosa wa hyooban da.

docility well-known

"Taroo's docility is well known."

As predicted, we obtain the grammatical sentences:

(18) a. Taroo wa eigo ga subarasii.

"As for Taroo, his English is excellent."

b. Taroo wa sunaosa ga hyooban da.

"As for Taroo, his docility is well known."

In this way, the constraint in (16), though not a far-reaching principle, certainly provides a basis for a unified account of relevant linguistic phenomena. In what follows, I will demonstrate that a similar constraint is required in English as well.

2. In the case of English, P in the structure [<sub>NP<sub>0</sub></sub> NP<sub>1</sub> P NP<sub>2</sub>] represents a preposition. First, consider the following examples:

(19) a. I like [<sub>NP</sub> the gears in that car].

b. Which car do you like the gears in?

c. The car which I like the gears in is over there.

(20) a. I like [<sub>NP</sub> the girl in that car].

b. \*Which car do you like the girl in?

c. \*The car which I like the girl in is over there.

These examples, except (19c), are taken from Cattell (1976).



inalienable relation by definition includes the part-whole relation. Concerning (19), since removal of the gears from a car makes it unviable in function, we can say that they are inalienable for it; or to put it in terms of (15), a car and the gears have an inalienable relation because the existence of the former necessarily implies that of the latter. As regards (20), the girl is not necessarily connected with a car and hence has no inalienable relation to it.

These observations suggest that in English as well, extraction out of noun phrases of the form in question is allowed only if NP<sub>1</sub> and NP<sub>2</sub> in them intrinsically have an inalienable relation.

Similarly, we can explain the following examples:<sup>9</sup>

- (23) a. We painted [<sub>NP</sub> the side of the house].  
 b. The house which we painted the side of is over there.
- (24) a. We waxed [<sub>NP</sub> the top of the table].  
 b. (?)The table that we waxed the top of was blue.
- (25) a. We waxed [<sub>NP</sub> the shoes on the table].  
 b. \*The table that we waxed the shoes on was blue.

The nouns side and top, like father and sister, express inherently relational notions,<sup>10</sup> and nouns of this sort have an inalienable property (cf. Fillmore (1968, p. 61)). Therefore, we can extract NP<sub>2</sub> out of the object noun phrase in (23a) and (24a); hence the grammaticality of (23b) and (24b). In (25), on the other hand, shoes is not necessarily connected with table: it just happened that the shoes were on the table. So we can say that (25b) is ungrammatical<sup>11</sup> because the table has been extracted despite the fact that shoes intrinsically has no inalienable

relation to it.

I now propose a generalized semantic constraint as in (26), which holds in English as well as in Japanese:

- (26) No element which is within the noun phrase structure  $\{_{NP_0} NP_1 P NP_2\}$  (where P represents the particle no in Japanese or a preposition in English) can be extracted out of  $NP_0$  by a transformation if  $NP_1$  and  $NP_2$  intrinsically have no inalienable relation.

One thing we should pay attention to about this constraint is that it is not a sufficient but a necessary condition on the extraction operation in question. I will say a few words on this point below, confining myself to the case of English.<sup>12</sup>

The English expression a picture of John, as is commonly known, does not mean "a picture that John has": it does not have the sense of alienable possession, but rather the sense of inalienable possession, so to speak. Hence (27b) is grammatical:

- (27) a. He saw a picture of John.  
 b. Who did he see a picture of?

However, the (b) sentences in the following examples are ungrammatical:

- (28) a. He saw Mary's picture of John.  
 b. \*Who did he see Mary's picture of?
- (29) a. He  $\left\{ \begin{array}{l} \text{destroyed} \\ \text{lost} \end{array} \right\}$  a picture of John.  
 b. \*Who did he  $\left\{ \begin{array}{l} \text{destroy} \\ \text{lose} \end{array} \right\}$  a picture of?

We should note that (28b) and (29b) are in no way counterexamples to the constraint in (26); they do observe it. It is for other

reasons that they are ungrammatical. There is independent evidence, which I will not review here, that the ungrammaticality of (28b) is concerned with the presence of the possessive Mary's and that of (29b) with a certain semantic property of the verbs destroy and lose. (For a more detailed discussion, see Erteschik (1973) and Nakau (1981), which independently give a semantic account of these sentences.) Therefore, it is reasonable--and in fact, the case--to suppose that (28b) and (29b) are ungrammatical on grounds "external" to the NP<sub>0</sub> domain even though they observe the constraint in (26). On the other hand, such sentences as (20b), (20c), (22), and (25b) ungrammatical on "internal" grounds: they violate (26). These considerations show that the converse of (26) is not (always) true; thus, the constraint constitutes not a sufficient but a necessary condition on the extraction operation in question. This will by no means diminish its significance, however.

3. Finally, I consider the question: why is it that two elements which intrinsically have an inalienable relation are syntactically separable? In a word, this seems to be because these elements intrinsically have a close semantic connection that is hard to sever even by their syntactic separation. In contrast, the semantic connection between those elements which have an alienable relation is guaranteed by nothing but their syntactic connection (i.e. constituent-relation). Hence, as soon as their syntactic connection is severed, their semantic connection is severed, too; this may be why two elements having an alienable relation are syntactically unseparable.

The inalienable relation may be looked upon as the semantically unseparable relation, and the alienable relation as the

semantically separable relation. Consequently, I conclude that those elements which have a semantically unseparable relation are syntactically separable while those which have a semantically separable relation are syntactically unseparable,<sup>13</sup> as shown in the following table:

(30) A General Relationship between Two Elements in Syntactic and Semantic Separability

Semantic separability	—	+
Syntactic separability	+	—

(The "+" symbol means "separable" or "easy to separate"; the "-" symbol means "unseparable" or "hard to separate".)

This table suggests that syntax and semantics are complementary in the separability of two elements.

It may be safe to say that the proposed semantic constraint (26) has some universal flavor, since it is required in the two typologically quite different languages, Japanese and English. Furthermore, this constraint seems to be incorporated into the more far-reaching, unifying principle expressed in (30), whose empirical validity, however, I am not very sure of, at present.<sup>14</sup>

NOTES

\* I am especially grateful to Katsunori Fukuyasu, Norimi Kimura, Minoru Nakau, and Masaki Sano for their important comments on an earlier version of this paper.

<sup>1</sup> See, for example, Ross (1967) and Chomsky (1973) for the former and Erteschik (1973) and Nakau (1981) for the latter.

<sup>2</sup> This sentence may well be acceptable only if Taroo wa is interpreted as contrastive.

<sup>3</sup> NP<sub>1</sub> need not be [+Animate] or [+Human]. Cf. (i):

- (i) Kono ie wa genkan ga kirei da.  
       this house porch beautiful

"As for this house, its porch is beautiful."

<sup>4</sup> Katsunori Fukuyasu has pointed out to me that unlike (13a), (10a) will not be rendered grammatical by replacement of inu with aiken:

- (i) \*Taroo wa aiken ga ookii.

"As for Taroo, his pet dog is big."

Norimi Kimura also has suggested to me that there is a difference in grammaticality between (iib) and (iiiib):

- (ii) a. Daitooryoo no hisyo wa utokusii.  
        the President secretary beautiful

"The President's secretary is beautiful."

- b. ?\*Daitooryoo wa hisyo ga utokusii.

"As for the President, his secretary is beautiful."

- (iii) a. Daitooryo no hisyo wa kuruma ni hikareta sooda.

"I hear the President's secretary was run over by a car."

- b. Daitooryo wa hisyo ga kuruma ni hikareta sooda.

"As for the President, I hear his secretary was run over by a car."

Note that the predicate of (i) and (ii) represents a state while that of (13) and (iii) (i.e. hikareta) represents an action. This semantic difference may have something to do with the grammaticality difference between (i) and (iib) on the one hand,

and (13b) and (iiib) on the other. In any case, such sentences as (i) and (iib) cannot be properly accounted for by my analysis presented below. I leave this problem open.

<sup>5</sup> E.g. Ross's (1967) Complex NP Constraint.

<sup>6</sup> For this notion, see Fillmore (1968) and Chomsky (1970). But I will use this notion in a broader sense, as described below.

<sup>7</sup> I say "No element ... can be extracted ...," because extraction of the head NP<sub>2</sub> generally is not allowed, either (cf. Chomsky's A-over-A Condition).

<sup>8</sup> In this context, eigo is interpreted as referring to "command of English".

<sup>9</sup> Examples (24b) and (25b) are taken from Bach and Horn (1976). They give no account of their difference in grammaticality. They provide these examples simply to indicate that their NP Constraint to the following effect is too strong: "No constituent that is dominated by NP can be moved or deleted from that NP by a transformational rule" (p. 280). The present discussion surely claims that the NP Constraint be weakened to a certain extent. Incidentally, (24b) fluctuates a little in grammaticality, but it is, without doubt, more grammatical by far than (25b).

<sup>10</sup> The nouns side and top always imply the of-relation, as we speak of "a side of something" and "the top of something".

<sup>11</sup> (25b) is grammatical only if the prepositional phrase on the table is immediately dominated by the verb phrase.

<sup>12</sup> For Japanese, see note 4.

<sup>13</sup> A similar observation is also found in Saito (1979).

<sup>14</sup> Minoru Nakau has pointed out to me that most if not all idiomatic expressions are counterexamples to (30); although the

constituents of idioms are semantically unseparable because of the noncompositionality of their meaning, yet these constituents are generally hard to separate syntactically, as can be seen in the following examples:

- (i) a. John kicked the bucket. ("John died.")
  - b. \*The bucket was kicked by John.
- (ii) a. Someone took advantage of their innocence.
  - b. Advantage was taken of their innocence.
  - c. \*The advantage that he took of her was scurrilous.

There seem to be other factors involved in these cases, which, however, I will not consider here. (See Yamada (1979) for an interesting treatment of these English idioms.) Anyway, (30) should be confined to nonidiomatic expressions whose meaning is compositional.

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