

# Long-Distance Scrambling via Partial Compaction

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In this paper, I propose a novel analysis of long-distance scrambling constructions in Japanese that is linguistically more adequate than those previously suggested in the literature. At the heart of my proposal is the view, suggested in Yatabe (1993a), that there is a theoretically significant parallelism between long-distance scrambling in Japanese and extraposition in languages like English. I present some additional evidence for this view in Section 1, and then describe in Section 2 how the parallelism in question can be captured within a framework in which syntactic structure and linear order are mediated not via encodings of hierarchical relations but instead via order domains.

## 1. Parallelism between extraposition and long-distance scrambling

The sentence in (1) is a typical example of long-distance scrambling.

- (1) [Sono hon ni] Ken ga [Naomi ga sawatta to] itta.  
[that book DAT] Ken NOM [Naomi NOM touch-PAST COMP] say-PAST  
'Ken said that Naomi had touched the book.'

In this sentence, the sentence-initial dative noun phrase *sono hon ni* is said to have been scrambled out of the embedded clause. Most analyses of this

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construction are based on the view that sentences like (1) are generated by a movement operation of some sort, a view defended at length in Saito (1985). It will be my contention that those analyses are on the wrong track.

I submit that examples such as (1) should be seen as cases of extraposition, analogous to an English sentence like *A man entered who was wearing a black cloak* (an example taken from McCawley (1988)), where the relative clause *who was wearing a black cloak* is said to have been extraposed out of NP. The basic idea behind this proposal is that Japanese has an operation that extraposes expressions out of clauses (as well as an operation that extraposes expressions out of NPs, as we will see shortly) whereas English has only an operation that extraposes expressions out of NPs.

The fact that long-distance scrambling in Japanese involves leftward dislocation does not pose a problem for the proposed account. Examples like those in (2), whose resemblance to familiar English extraposition constructions is evident, lend support to the view that, unlike extraposition in English, extraposition in Japanese shifts expressions to the left.

- (2) [Tanaka sensei no], tabun kore ga [saigo no chosho ni]  
 [Prof. Tanaka GEN] probably this NOM [last GEN book DAT]  
 naru darô.  
 become-PRES it seems  
 ‘It seems that this will probably become Prof. Tanaka’s last book.’

According to the theory presented in this paper, (1) is generated by extraposing of a dative NP (*sono hon ni*) out of an embedded clause and (2) is generated by extraposing a genitive NP (*Tanaka sensei no*) out of a dative NP.

It can be shown that there is a theoretically significant parallelism between long-distance scrambling in Japanese and extraposition in English. Consider the contrast between (3a) and (3b).

- (3) a. [Sono tegami o], Tarô ga, [[Jirô ga kakushite iru  
 [that letter ACC] Taro NOM [[Jiro NOM hide-GER be-PRES  
 to iu], rei no shuchô o] shita.  
 to the effect that] familiar claim ACC] do-PAST  
 ‘Taro made the familiar claim that Jiro was hiding the letter.’
- b.\*[Sono tegami o], Tarô ga, [rei no, [Jirô ga kakushite  
 [that letter ACC] Taro NOM [familiar [Jiro NOM hide-GER  
 iru to iu] shuchô o] shita.  
 be-PRES to the effect that] claim ACC] do-PAST

Both (3a) and (3b) involve an NP ‘the familiar claim that Jiro was hiding the letter’, in which the head noun ‘claim’ is preceded by two dependents, a complement clause and a modifier. The only difference between the two is the order between the prenominal complement clause (‘that Jiro was hiding the letter’) and the prenominal modifier (‘familiar’). The sentence in (3a), in which the leftmost element of the NP (‘the familiar claim that Jiro was hiding the letter’) has been scrambled out of that NP, is acceptable. On the other hand, the sentence in (3b), in which something that is not the leftmost element of the NP has been scrambled out of that NP, is unacceptable. The pair of sentences shown in (4a) and (4b) exhibit the same pattern.

- (4) a. [Tokyo made], kare ga, [[yo-jikan tarazu de tadoritsuita],  
 [Tokyo up to] he NOM [[less than 4 hours INST reach-PAST]  
 genki na hito o] mitsuketa rashii.  
 energetic COP.PRES.ATTR person ACC] find-PAST it seems-PRES  
 ‘It seems that he found an energetic person who managed to reach  
 Tokyo in less than 4 hours.’
- b.\*[Tokyo made], kare ga, [genki  
 [Tokyo up to] he NOM [energetic  
 na, [yo-jikan tarazu de tadoritsuita] hito o]  
 COP.PRES.ATTR [less than 4 hours INST reach-PAST] person ACC]  
 mitsuketa rashii.  
 find-PAST it seems-PRES

These sentences both involve an NP ‘an energetic person who managed to reach Tokyo in less than 4 hours’, in which the head noun ‘person’ is preceded by two relative clauses. The sentence in (4a), in which the leftmost element of the NP (‘an energetic person who managed to reach Tokyo in less than 4 hours’) has been scrambled out of that NP, is acceptable, whereas the sentence in (4b), in which something that is not the leftmost element of the NP has been scrambled out of that NP, is unacceptable.

The unacceptability of (3b) and (4b) can be captured by the constraint stated in (5), which I will refer to as the Left Periphery Constraint.

- (5) The Left Periphery Constraint (on long-distance scrambling in Japanese):  
 A string  $\alpha$  can be long-distance-scrambled out of an expression  $\beta$  only if  $\alpha$  constitutes the left periphery of  $\beta$ .

The contrast between (6a) and (6b) is also correctly captured by the Left Periphery Constraint.

- (6) a. Shi-go-nin, Tarô ga, [gakusei ga hon o katta to]  
 4 or 5 people Taro NOM [student NOM book ACC buy-PAST COMP]  
 itteta yo.  
 be saying-PAST I tell you  
 ‘Taro was saying that 4 or 5 students had bought books.’
- b.?\*Shi-go-nin, Tarô ga, [hon o gakusei ga katta to]  
 4 or 5 people Taro NOM [book ACC student NOM buy-PAST COMP]  
 itteta yo.  
 be saying-PAST I tell you
- (7) a. Shi-go-nin gakusei ga hon o katta.  
 4 or 5 people student NOM book ACC buy-PAST  
 ‘4 or 5 students bought books.’
- b.?\*Shi-go-nin hon o gakusei ga katta.  
 4 or 5 people book ACC student NOM buy-PAST

The low acceptability of sentence (6b) can be seen as a consequence of the low acceptability of (7b),<sup>1</sup> given the Left Periphery Constraint. Likewise, the acceptability of (6a) can be seen as a consequence of the acceptability of (7a).

The fact that a constraint like the Left Periphery Constraint is operative lends support to the view that long-distance scrambling in Japanese is essentially the same phenomenon as extraposition in English, as extraposition in English obeys the constraint stated in (8), which is evidently a mirror image of (5).

- (8) The Right Periphery Constraint (on extraposition in English):  
 A string  $\alpha$  can be extraposed out of an NP  $\beta$  only if  $\alpha$  constitutes the right periphery of  $\beta$ .

The statement in (8) captures (among other things) the fact that prenominal APs cannot be extraposed out of NPs in English (see Kathol and Pollard (1995) and the references cited there).

In example (9a), two syntactic constituents have been scrambled out of the embedded clause, and the second one *hanmin to* obviously could not have constituted the left periphery of the embedded clause. But (9a) is not a counterexample to the Left Periphery Constraint, because the string made up of the two scrambled expressions could have constituted the left periphery of the embedded clause. The same can be said about (10a).

<sup>1</sup> See Miyagawa (1989), Yatabe (1990), and Gunji and Hasida (1994) for various attempts to explain the low acceptability of sentences like (7b).

- (9) a. [Ken no koto o] [hannin to] Tanaka ga keisatsu ga  
 [Ken GEN matter ACC] [culprit COMP] Tanaka NOM police NOM  
 shinjikonde iru to omotte iru (koto)  
 believe-GER be-PRES COMP think-GER be-PRES (fact)  
 ‘(the fact that) Tanaka thinks that the police firmly believe Ken  
 to be the culprit’
- b.\*[Hannin to] [Ken no koto o] Tanaka ga keisatsu ga  
 [culprit COMP] [Ken GEN matter ACC] Tanaka NOM police NOM  
 shinjikonde iru to omotte iru (koto)  
 believe-GER be-PRES COMP think-GER be-PRES (fact)
- (10) a. [Kankyaku ga] [sû-hyaku-nin o] Tarô wa  
 [spectators NOM] [hundreds of people ACC] Taro TOP  
 kazoeta to itte ita.  
 number in-PAST COMP say-GER be-PAST  
 ‘Taro was saying that spectators numbered in the hundreds.’
- b.\*[Sû-hyaku-nin o] [kankyaku ga] Tarô wa  
 [hundreds of people ACC] [spectators NOM] Taro TOP  
 kazoeta to itte ita.  
 number in-PAST COMP say-GER be-PAST

The assumption behind the Left Periphery Constraint is (i) that long-distance scrambling is an operation that displaces a contiguous string out of an expression, and (ii) that long-distance scrambling is not allowed to displace more than one string out of an expression. (9a) is acceptable because the sentence-initial string *Ken no koto o hannin to* could have constituted the left periphery of the embedded clause, as shown in (11a), and (9b) is not acceptable because the sentence-initial string *Hannin to Ken no koto o* in this example could not have constituted the left periphery of the embedded clause, as shown in (11b). Likewise, the contrast between (10a) and (10b) reduces to the contrast between (12a) and (12b).

- (11) a. [Ken no koto o] [hannin to] keisatsu ga shinjikonde  
 [Ken GEN matter ACC] [culprit COMP] police NOM believe-GER  
 iru.  
 be-PRES  
 ‘The police firmly believe Ken to be the culprit.’
- b.\*[Hannin to] [Ken no koto o] keisatsu ga shinjikonde  
 [culprit COMP] [Ken GEN matter ACC] police NOM believe-GER  
 iru.  
 be-PRES

- (12) a. [Kankyaku ga] [sû-hyaku-nin o] kazoeta.  
 [spectators NOM] [hundreds of people ACC] number in-PAST  
 ‘Spectators numbered in the hundreds.’
- b.\*[Sû-hyaku-nin o] [kankyaku ga] kazoeta.  
 [hundreds of people ACC] [spectators NOM] number in-PAST

Notice, incidentally, that the unacceptability of sentences like (3b) and (4b) cannot be ascribed to the presence of center-embedding. The sentences in (13), which involve as much center-embedding as (3b) and (4b), are perfectly acceptable.

- (13) a. Tarô ga, [<sub>NP</sub> rei no, [<sub>S</sub> sono tegami o Jirô ga kakushite iru] to iu shuchô o] shita.  
 ‘Taro made the familiar claim that Jiro was hiding the letter.’
- b. Kare ga, [<sub>NP</sub> genki na, [<sub>S</sub> Tokyo made yo-jikan tarazu de tadoritsuita] hito o] mitsuketa rashii.  
 ‘It seems that he found an energetic person who managed to reach Tokyo in less than 4 hours.’

The discussion so far is obviously far from conclusive, but in the remainder of this paper, I will pretend to have established that long-distance scrambling in Japanese is a type of extraposition.

## 2. A linearization-based analysis of long-distance scrambling

### 2.1. Order domains

Now, the parallelism between long-distance scrambling and extraposition can be captured straightforwardly within a certain extension of HPSG that has been suggested by Kathol and Pollard (1995). In Kathol and Pollard’s theory, the portion of syntactic structures that determines grammatical dependency relations is represented by means of unordered trees, that is, trees with no specifications as to the ordering of its constituents. The information as to the order of various constituents is contained in what are called *order domains* (or *domains* for short), each of which is associated with a node in an unordered tree. An order domain is a list of domain elements, and is given as the value of the DOM feature. A domain element is, roughly speaking, an expression, i.e. a word or a phrase; unlike an expression, however, it does not carry any information as to its internal morphosyntactic structure.

Let me take a concrete example. Figure 1 shows part of the structure assigned to the English sentence *The man bought it*. What is shown in this figure is an unordered tree. There is actually no linear precedence

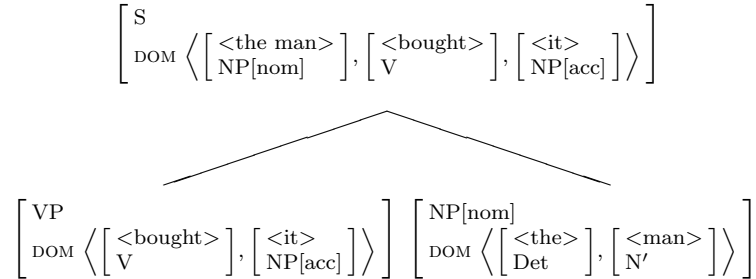


Figure 1: Total compaction of an NP

relation between the VP node and the NP node; I placed the VP node to the left of the subject NP node in order to underscore the insignificance of the apparent linear order between the two. The order domain (i.e. the DOM value) of the VP node consists of two domain elements, one that is pronounced *bought*, and the other one that is pronounced *it*. The order between these two domain elements *is* significant; it indicates that this VP is to be pronounced *bought it*, rather than *it bought*. Likewise, the order domain of the NP node tells us that this NP is to be pronounced *the man*, and the order domain of the S node tells us that the S node is to be pronounced *The man bought it*.

Let us take a closer look and see how the order domain of the S node is related to the order domains of the NP node and the VP node in Figure 1. The two domain elements in the VP's order domain are both integrated, unaltered, into the order domain of the S node. Notice that the order between the two domain elements is the same in the VP's order domain and the S's order domain; the domain element that is pronounced *bought* precedes the domain element that is pronounced *it* in the S's order domain as well as in the VP's order domain. This is a consequence of the constraint given in (14).

- (14) The Persistence Constraint (see Kathol (1995)):  
 Any precedence relations holding of domain elements in one order domain are also required to hold of those elements in all other order domains that they are members of.

Next, let us see how the NP's order domain is related to the S's order domain in Figure 1. The order domain of the NP node contains two domain elements, but this NP node contributes to the order domain of the S node only one domain element, which is pronounced *the man*. What is at work here is an operation called *total compaction*.<sup>2</sup> (15) illustrates the way the

<sup>2</sup> Kathol and Pollard define compaction as a relational constraint, but I am going to define it as an operation, for ease of exposition. The total compaction operation that I

total compaction operation takes an expression and turns it into a single domain element.

(15) Total compaction:

$$\left[ \begin{array}{l} \alpha_0 \\ \text{DOM} \left\langle \left[ \begin{array}{l} < \beta_1 > \\ \alpha_1 \end{array} \right], \dots, \left[ \begin{array}{l} < \beta_n > \\ \alpha_n \end{array} \right] \right\rangle \end{array} \right] \Rightarrow \left[ \begin{array}{l} < \beta_1 \circ \dots \circ \beta_n > \\ \alpha_0 \end{array} \right]$$

What's shown on the left of the arrow is the input to the operation; the input is an expression. The first line of an expression (namely “ $\alpha_0$ ” in this case) indicates its syntactic category; the second line (namely “DOM . . .”) shows what its order domain looks like. On the right of the arrow is shown the output of the operation; the output is a domain element. The first line of a domain element (namely “ $< \beta_1 \circ \dots \circ \beta_n >$ ” in this case) is a string that shows how it is pronounced. (The small circle is an operator that concatenates strings.) The second line of a domain element (namely “ $\alpha_0$ ” in this case) indicates its syntactic category.

In Figure 1, the subject NP is totally compacted and produces a single domain element, which is pronounced *the man*. This resultant domain element is then placed in the S's order domain.

The order between the domain element that comes from the subject NP and the domain elements that come from the VP is determined by a linear precedence statement that states that a nominative NP should precede a V in English. (I will not formalize the linear precedence statement in this paper.)

So far, we have seen two ways in which a given node's domain elements can be integrated into that of its mother. First, an expression can be totally compacted. When this happens, that expression contributes only one domain element to the order domain of its mother. This is what's happened to the subject NP in Figure 1. Second, an expression may undergo no compaction whatsoever and contribute all the domain elements in its order domain to the order domain of its mother. Henceforth I am going to describe this situation by saying that the expression in question has been *liberated*. The VP in Figure 1 has been liberated.

Now, there is a third way in which a given node's DOM value can be integrated into that of its mother: *partial compaction*. Partial compaction takes an expression and turns it into one or more domain elements, as opposed to total compaction, which always produces a single domain element. (As will become clear shortly, total compaction can be seen as a special case

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define here is nevertheless equivalent to what they define as total compaction. On the other hand, the partial compaction operation that I define later in the text is not strictly equivalent to what they define as partial compaction.



of partial compaction.) (16) and (17) illustrate the way the partial compaction operation takes an expression and turns it into one or more domain elements; in both(16) and (17), the first line is the input and the second line is the output. I suggest that the version of partial compaction shown in (16) is operative in head-first languages like English and that the version shown in (17) is operative in head-last languages like Japanese.

(16) Partial compaction (for head-first languages):

$$\begin{array}{l} \left[ \begin{array}{c} \alpha_0 \\ \text{DOM} \left\langle \left[ \begin{array}{c} < \beta_1 > \\ \alpha_1 \end{array} \right], \dots, \left[ \begin{array}{c} < \beta_n > \\ \alpha_n \end{array} \right] \right\rangle \end{array} \right] \Rightarrow \\ \left[ \begin{array}{c} < \beta_1 \circ \dots \circ \beta_i > \\ \alpha_0 \end{array} \right], \left[ \begin{array}{c} < \beta_{i+1} > \\ \alpha_{i+1} \end{array} \right], \dots, \left[ \begin{array}{c} < \beta_n > \\ \alpha_n \end{array} \right] \\ (1 \leq i \leq n) \end{array}$$

(17) Partial compaction (for head-last languages):

$$\begin{array}{l} \left[ \begin{array}{c} \alpha_0 \\ \text{DOM} \left\langle \left[ \begin{array}{c} < \beta_1 > \\ \alpha_1 \end{array} \right], \dots, \left[ \begin{array}{c} < \beta_n > \\ \alpha_n \end{array} \right] \right\rangle \end{array} \right] \Rightarrow \\ \left[ \begin{array}{c} < \beta_1 > \\ \alpha_1 \end{array} \right], \dots, \left[ \begin{array}{c} < \beta_{i-1} > \\ \alpha_{i-1} \end{array} \right], \left[ \begin{array}{c} < \beta_i \circ \dots \circ \beta_n > \\ \alpha_0 \end{array} \right] \\ (1 \leq i \leq n) \end{array}$$

In (16), the DOM value of the expression that is fed to the operation as the input has  $n$  domain elements in it. Of those domain elements, the first (i.e. leftmost)  $i$  domain elements are bundled together and turned into a single domain element, while the remaining domain elements, if any, are left out of the bundle and continue to be separate domain elements. (17) is a mirror image of (16); of the  $n$  domain elements in the input, the last (i.e. the rightmost)  $n - i + 1$  domain elements are bundled together and turned into a single domain element, whereas the remaining domain elements, if any, are left out of the bundle and continue to be separate domain elements.

When an expression is partially compacted, part of that expression can appear detached from the main portion of that expression, giving rise to various types of extraposition constructions. Figure 2 shows how the English extraposition construction can be generated via partial compaction. Here, the V has been liberated<sup>3</sup> and the subject NP has been partially compacted. The relative clause has been left out of the bundle and appears in the sentence-final position. (Again, what puts the relative clause in this particular position is an English-particular linear precedence statement, which I will not formulate in this paper.)

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<sup>3</sup> In fact, it does not matter whether the V has been liberated or not, since the order domain of the V contains only one domain element.

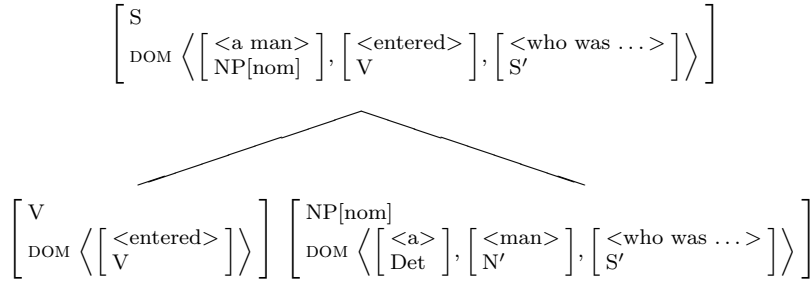


Figure 2: Partial compaction of an NP

## 2.2. An analysis of long-distance scrambling

I make the assumptions shown in (18) in order to account for the long-distance scrambling constructions in Japanese. (18a), (18c), and (18d) are intended to be universal constraints, whereas (18b) is intended to be an English-particular constraint. My claim is that, unlike English, Japanese does not require  $S$ 's to be totally compacted when they combine with verbal heads.

- (18) a. When a verbal head combines with a dependent (i.e. a complement or an adjunct), the head is liberated and the dependent is partially compacted.
- b. In English, when a verbal head combines with an  $S'$ , the  $S'$  is totally compacted.
- c. When a nominal head combines with a dependent, the head is totally compacted and the dependent is partially compacted.
- d. When a head combines with a marker (such as a case particle and a complementizer), the head and the marker are both liberated.

Figure 3 shows how the sentence in (1) is generated in the proposed analysis. At the bottom of this unordered tree, we have an  $S$  and a complementizer. They are both liberated, yielding an  $S'$  whose order domain contains four domain elements. The topmost  $S$  is composed of this  $S'$ , a nominative noun phrase, and a verb. The verb is liberated, the nominative NP is partially (in fact totally) compacted, and the  $S'$  is partially compacted. The first (i.e. the leftmost) domain element in the order domain of the  $S'$  is left out of the bundle and ends up in the sentence-initial position.

Notice that the Left Periphery Constraint is simply a consequence of the Persistence Constraint, stated in (14). The Persistence Constraint will be violated whenever something that doesn't constitute the left periphery of a phrase is scrambled leftward out of that phrase, as in (6b). The low

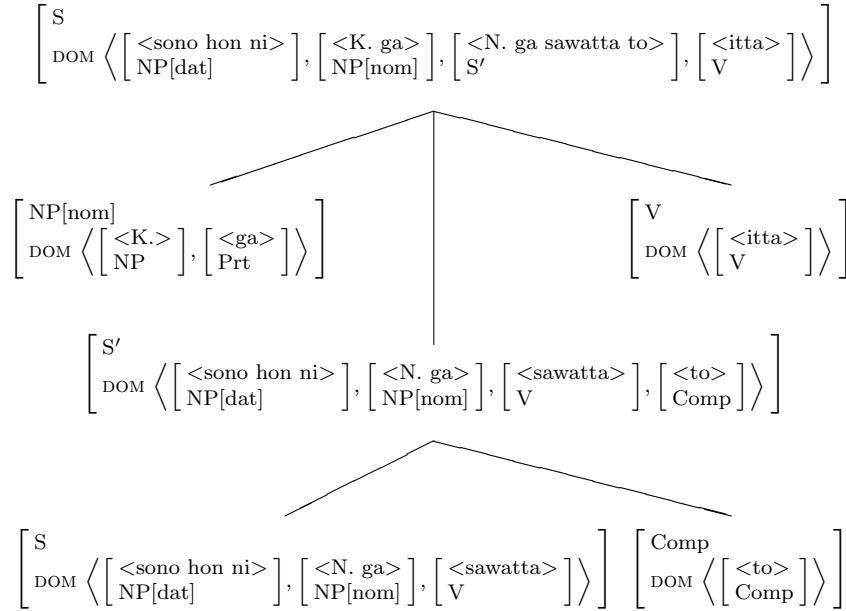


Figure 3: Long-distance scrambling via partial compaction

acceptability of sentences like (9b) and (10b) is also a consequence of the Persistence Constraint; when two or more expressions are scrambled out of a phrase, the linear order between the scrambled expressions must be preserved, if the Persistence Constraint is to be satisfied.

(18c) requires that a nominal head should be totally compacted when it is combined with a dependent (such as a relative clause). This requirement is needed to rule out examples like (3b) and (4b); the Persistence Constraint alone would not rule out these examples.<sup>4</sup>

The proposed analysis successfully captures not only the observations presented in Section 1 but also some other facts (noted in Yatabe (1993a; 1993b, subsection 8.3.2)) that favor the extraposition analysis of long-distance scrambling. First, consider the example in (19).

- (19)?[dono hon o] Meari ga [Jon ga toshokan kara  
[which book ACC] Mary NOM [John NOM library from  
karidashita ka] shiritagatte iru (koto)  
check out-PAST Q learn-want-GER be-PRES (NML)  
‘(the fact that) Mary wants to know which book John checked out

<sup>4</sup> It is also necessary to assume that the bracketed NPs in (3b) and (4b) that immediately precede the verbs have binary-branching structure, rather than flat structure.

from the library’  
 (from Saito (1989))

(19) exemplifies the fact that long-distance scrambling can be semantically vacuous (see Saito (1989)). This fact is no mystery in the proposed account, in which long-distance scrambling is assumed to alter linear precedence but not constituent structure.

Second, consider the sentence in (20). (20) illustrates the fact that resumptive pronouns cannot be used in long-distance scrambling constructions (see Saito (1985)). This fact can be understood as a consequence of the fact that there is no syntactic dislocation involved in these constructions.

(20)\*[sono hon<sub>i</sub> ni] Ken ga nazeka [Naomi ga sore<sub>i</sub> ni  
 [that book DAT] Ken NOM somehow [Naomi NOM it DAT  
 sawatta to] omotte iru (koto)  
 touch-PAST COMP] think-GER be-PRES (NML)  
 ‘(the fact that) Ken somehow thinks that Naomi touched the book’

Incidentally, unlike Yatabe’s (1993a) account (and like Yatabe’s (1993b, section 8.3) account), the present account makes the prediction that an expression can be scrambled across more than one clause boundary.<sup>5</sup> This is likely to be a correct prediction; I have found, in one of Yukio Mishima’s novels, a sentence in which an NP seems to have been scrambled over two clause boundaries. (21) is the sentence.

(21) [NP Jidai ga shûu no yô ni zawamekitatte,  
 [NP the times NOM sudden rain GEN manner DAT sputter-GER  
 kazu-naranu hitori-hitori o mo uteki de uchi, koko no  
 nameless each person ACC also raindrop INST hit-CONT individual  
 unmei no koishi o manben-naku nurashite yuku no o],  
 fate GEN pebble ACC all over wet-GER ‘go’-PRES NML ACC]  
 Honda wa [NP [S doko ni mo [NP [S oshitodomeru] chikara] no  
 Honda TOP [NP [S anywhere [NP [S stop-PRES] power] GEN  
 nai] koto o] shitte ita.  
 be.NEG-PRES] fact ACC] know-GER be-PAST  
 ‘[The process whereby history sputters like a sudden rain, hits all  
 nameless mortals with raindrops, and wets each individual pebble  
 of fate]<sub>i</sub>, Honda knew [that no power [that could stop *t<sub>i</sub>*] existed  
 anywhere].’  
 (from Yukio Mishima, *Honba*)

<sup>5</sup> In English, on the other hand, an expression cannot be extraposed across a clause boundary. In the proposed account, this is guaranteed by (18b).

(It is not quite clear whether (21) can be said to obey the Left Periphery Constraint, as the sentence-initial accusative NP in this example constitutes the left periphery of the larger of the two bracketed Ss only ‘after’ it is extraposed out of the smaller bracketed S. I will not try to make the Left Periphery Constraint any more precise than it is now, however, because it is intended merely as an informal description, and has been replaced by the Persistence Constraint. Notice that (21) can be generated without violating the Persistence Constraint.)

### 2.3. Comparison with Sheard’s analysis

Sheard (1991) presents an analysis of long-distance scrambling in which a sentence like (1) is assumed to be generated by rightward movement of the main-clause subject into the embedded clause. This is an interesting analysis, in that it automatically rules out all strings that violate the Left Periphery Constraint. There are, however, some reasons to prefer my analysis over Sheard’s.

First, the *shika-nai* test, which can be used to determine which clause a given expression belongs to, indicates that the sentence-initial expressions in examples such as (1) belong to the main-clauses (i.e., they are clausemates of the main-clause predicates) (see Kuno (1988, fn. 4)). Consider the following sentence.

- (22) [Sono hon ni shika] Ken wa [Naomi ga sawatta to]  
 [that book DAT except] Ken TOP [Naomi NOM touch-PAST COMP]  
 iwanakatta.  
 say-NEG-PAST  
 ‘Ken only said that Naomi had touched *that* book.’

An NP marked by the word *shika* ‘except’ must be a clausemate of a negated predicate (see Muraki (1978) and Yatabe (1993b, subsection 8.3.3)). Therefore the above example shows that the sentence-initial expression in this type of sentence is a clausemate of the main-clause predicate. This observation contradicts Sheard’s analysis, in which the sentence-initial expression in this type of sentence is claimed to be inside the embedded clause. On the other hand, this observation does not contradict the analysis presented in the previous subsection, on the assumption that two expressions  $\alpha$  and  $\beta$  are clausemates if and only if there is an order domain  $d$  such that the domain element corresponding to  $\alpha$  and the domain element corresponding to  $\beta$  are both members of  $d$ .

Second, Sheard’s analysis overgenerates. For instance, on her account, the strings in (23a) and (23b) can be generated by moving the sentence-initial

NPs in (13a) and (13b) over the following two phrases.<sup>6</sup>

- (23) a.\**Rei no, sono tegami o, Tarô ga, Jirô ga kakushite iru to iu shuchô o shita.*  
'Taro made the familiar claim that Jiro was hiding the letter.'
- b.\**Genki na, Tokyo made, kare ga, yo-jikan tarazu de tadoritsuita hito o mitsuketa rashii.*  
'It seems that he found an energetic person who managed to reach Tokyo in less than 4 hours.'

It is not clear how these strings can be ruled out in Sheard's analysis. In the analysis presented in subsection 2.2, these strings will not be generated, primarily due to the constraint stated in (18c).

### 3. Conclusion

To conclude, there are several kinds of facts that indicate that long-distance scrambling in Japanese is a type of extraposition. A linearization-based theory that allows the operation of partial compaction provides a natural framework in which to capture those facts.

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<sup>6</sup> Note that the phrase *rei no* 'familiar' in example (23a) is intended to modify the noun *shuchô* 'claim'. This string is acceptable if the phrase *rei no* is interpreted as modifying the noun *tegami* 'letter'.

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