

## On the “Undoing” Property of Scrambling: A Response to Bošković

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Bošković (2004) argues that what defines scrambling in languages such as Japanese is its “undoing” property (Saito 1989). Bošković (2004) and Bošković and Takahashi (1998) argue that this “undoing” property shows the way for scrambling to count as a last-resort operation, instead of being purely optional as is widely believed. In this article, I give empirical evidence that “undoing” does not occur and that the reconstruction effect simply reflects a normal property of  $\bar{A}$ -movements like *wh*-movement in English. I further show that the condition that governs optional scrambling is Fox’s (2000) Scope Economy.

*Keywords:* scrambling, optional movement, economy, reconstruction, quantifier scope, focus

Within the Minimalist Program, all operations must be motivated (Chomsky 1993, 1995). This is a fundamental shift from Government-Binding Theory, in which a movement operation is considered to be purely optional and free: Move  $\alpha$  may move anything anywhere at any time, and it is up to independent principles to rule out the inappropriate derivations (e.g., Chomsky 1981). While most operations find a natural triggering mechanism within the Minimalist Program—most commonly, some formal morphological feature on a head—one construction has steadfastly resisted this view. Scrambling in languages such as Japanese has continued to be analyzed by a majority of linguists as a purely optional movement that does not require any motivation (e.g., Fukui 1993, Kuroda 1988, Saito 1989, Saito and Fukui 1998).<sup>1</sup> In the classic work on this topic, Saito (1989) argued that not only is scrambling purely optional, it must also obligatorily reconstruct at LF—the “undoing” property of scrambling—thereby characterizing scrambling as devoid of semantic content. In the following Japanese example, which is an instance of long-distance scrambling, the scrambled subordinate object, *sono hon-o* ‘that book-ACC’, is thought to obligatorily reconstruct to its original subordinate complement position, designated by the trace:

- (1) [<sub>IP</sub> Sono hon-o<sub>i</sub> [<sub>IP</sub> John-ga [<sub>CP</sub>[<sub>IP</sub> Mary-ga [<sub>VP</sub> t<sub>i</sub> katta]]] to] omotteiru].  
 [<sub>IP</sub> that book-ACC<sub>i</sub> [<sub>IP</sub> John-NOM [<sub>CP</sub>[<sub>IP</sub> Mary-NOM [<sub>VP</sub> t<sub>i</sub> bought]]] COMP] thinks]  
 ‘That book, John thinks Mary bought.’

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<sup>1</sup> For an alternative, “motivated” view of scrambling, see Grewendorf and Sabel 1999, Kitahara and Kawashima 2003, Miyagawa 1997, 2001, 2003a, 2005b, Otsuka 2005, and Sabel 2001, among others.

In a departure from the purely optional view of scrambling, Bošković and Takahashi (BT) (1998) use this undoing property to propose a ‘last resort’ approach to scrambling. To quote Bošković (2004:614):

BT propose an analysis of scrambling that replaces the optional overt movement of the classical analysis that violates Last Resort with an obligatory LF movement that fully conforms with Last Resort. They propose that the scrambled element in (1) is base-generated in its S-Structure position. If it were to remain in this position in LF, the derivation would crash because *sono hon-o* [‘that book-acc’] would not be Case- and  $\theta$ -licensed. *Sono hon-o* therefore undergoes lowering in LF to a position where it can receive Case and a  $\theta$ -role. The movement is obligatory in the sense that if it does not take place, the derivation will crash.

To make this work, BT treat  $\theta$ -roles as features, which may be strong or weak. In Japanese, they are weak; therefore, they need not be satisfied until LF. On the other hand, a language like English has strong  $\theta$ -role features; we do not find scrambling in English because the  $\theta$ -requirements must always be met at overt syntax.

Bailyn (2001) takes issue with BT’s analysis by showing that scrambling in Russian need not reconstruct. Bailyn also raises some theoretical problems with BT’s treatment of  $\theta$ -roles. In his response to Bailyn, Bošković (2004) defends BT’s analysis by emphasizing that it was developed on the basis of Japanese scrambling and the particular property of undoing. To again quote Bošković, the ‘undoing property . . . is taken in a number of works (. . . e.g., Fukui 1993, Saito and Fukui 1998, Saito 1992, 2000) to be the defining and most interesting property of Japanese-style scrambling’ (2004:618). The point is that BT’s analysis straightforwardly captures this ‘defining and most interesting property’ within the last resort framework of the Minimalist Program. Bošković (2004) also discusses related issues, including differences between Japanese and Russian scrambling, the relevance of islands for scrambling, and the theoretical status of movement into  $\theta$ -positions. Elsewhere (Bošković 2005), he makes the interesting observation that there appears to be a correlation between scrambling and lack of articles: only ‘NP’ languages, which lack articles, as opposed to ‘DP’ languages, which require articles, allow scrambling. This observation is distinct from the LF lowering analysis, so the two can be evaluated independently.

Here, I will focus on the undoing property of scrambling, which is the core property BT draw on to justify their ‘last resort’ LF lowering analysis of scrambling. In the literature, starting with Saito 1989, the undoing property is thought to be associated with  $\bar{A}$ -scrambling like the long-distance scrambling in (1). Focusing on this type of scrambling, and drawing on Miyagawa 2005a and works cited there, I will demonstrate two points. First, I will show that in virtually all instances of undoing of scrambling noted in the literature, there is in fact no undoing. Where there appears to be undoing, it is the familiar reconstruction effect found with  $\bar{A}$ -movement (e.g., *wh*-movement). Consequently, scrambling of the type discussed by BT and others appears simply to have the familiar properties of overt  $\bar{A}$ -movement, not the unusual obligatory LF lowering property. Second, following much work on the topic, I will suggest that scrambling of the type that BT deal with (long-distance scrambling) is an optional overt operation, but contrary to earlier works, I will show that it is subject to a specific universal requirement imposed on optional

movement: namely, the movement must have an effect on the output (Fox 2000, Reinhart 1995; also see Chomsky 2001). This will account for a particular undoing construction involving long-distance scrambling of a quantifier (Oka 1989, Tada 1993) that BT and Bošković (2004) use as crucial evidence for the unique undoing property of scrambling. Taken together, these points cast doubt on BT's "LF" lowering analysis. These points suggest that scrambling is a "normal" overt operation subject to universal conditions on movement. It is not purely optional and free, nor is it subject to obligatory LF lowering.

### 1 Saito's (1989) Argument

I will begin with a review of Saito's (1989) classic argument for the undoing property of scrambling. The crucial examples are given in (2).

- (2) a. John-ga [<sub>WH-ISL</sub> Taroo-ga nani-o katta ka] siritagatteiru.  
 John-NOM [<sub>WH-ISL</sub> TARO-NOM what-ACC bought Q] want.to.know  
 'John wants to know what Taro bought.'  
 b. ?Nani-o<sub>i</sub> John-ga [<sub>WH-ISL</sub> Taroo-ga t<sub>i</sub> katta ka] siritagatteiru.  
 what-ACC<sub>i</sub> John-NOM [<sub>WH-ISL</sub> TARO-NOM t<sub>i</sub> bought Q] want.to.know

(2a) is a declarative sentence that contains an indirect question. The crucial example is (2b). Here the *wh*-phrase, *nani* 'what', which originates inside the indirect question, has been scrambled to the head of the matrix clause. This is still a declarative sentence, so the *wh*-phrase cannot be licensed in its scrambled position. Consequently, the *wh*-phrase must be interpreted inside the indirect question despite occupying a surface position outside it. To allow this interpretation, the *wh*-phrase undergoes what Saito calls "radical reconstruction" back into the indirect question. The defining trait of radical reconstruction is that it does not leave a trace. It is as if the scrambling movement never took place—the overt movement is simply "undone" at LF. The only way this scrambling can be literally undone as just described is if scrambling is semantically vacuous, so that the original movement has no semantic import; as Bošković (2004:614) puts it, "... for semantics, scrambling does not exist." Therefore, it is a purely optional movement.

The reason why Saito (1989) considers (2b) to demonstrate the undoing property of scrambling is that, independently, he argues that all movement operations are subject to the Proper Binding Condition (Fiengo 1977, May 1977). On this assumption, one would not expect any lowering operations, overtly or at LF, since lowering something would leave an unbound trace in the head position of the chain. In this view, there is no reconstruction in the classic sense whereby something is lowered at LF (see, e.g., May 1977). I will not recreate Saito's arguments here; see Saito 1989, 2004 (and see Miyagawa 2005a for counterarguments). As Saito (1989) notes, despite this limit on reconstruction, it is a fact that in the Japanese example (2b), the scrambled *wh*-phrase must be interpreted in the indirect question for it to be properly associated with the [+wh] selection property of the indirect question. This is made possible by completely undoing the scrambling, leaving no trace that would trigger a Proper Binding Condition violation. Saito (1992) and Tada (1993) extend this undoing property to all instances of  $\bar{A}$ -scrambling. As

BT note, this undoing is the defining property of scrambling, which their proposal captures as a last resort operation.

In the following remarks, I will limit my discussion to long-distance scrambling, which has been the basis for the undoing proposal of scrambling.<sup>2</sup>

## 2 An Empirical Problem with Saito's (1989) Analysis

As noted by Nishigauchi (2002) (also see Miyagawa 2005a), Saito's (1989) undoing analysis makes the wrong prediction in Condition C environments. Nishigauchi observes the following example, taken from Lasnik and Saito 1999.

- (3) [John<sub>i</sub>-ni-tuite-no dono hon]-o<sub>j</sub>      kare<sub>i</sub>-ga [Hanako-ga t<sub>j</sub> ki-ni-itteiru ka]  
 [John<sub>i</sub>-about-GEN which article]-ACC<sub>j</sub> he<sub>i</sub>-NOM [Hanako-NOM t<sub>j</sub> like      Q]  
 sitte-iru.  
 knows  
 'He knows which article about John, Hanako likes.'

This example has the same structure as Saito's undoing example (2b). The *wh*-phrase, 'which article about John', has scrambled from within an indirect question to the head of the declarative sentence. Under the undoing analysis, this entire *wh*-phrase must obligatorily reconstruct. But that would incorrectly predict a Condition C violation, because *John* in the *wh*-phrase would end up being c-commanded by the pronoun *kare* 'he' in the matrix subject position. The fact that there is no Condition C violation—the sentence is fine with the intended interpretation, setting aside the usual awkwardness associated with long-distance scrambling—is evidence that the *wh*-phrase does not get put back. Nishigauchi correctly notes that the "conclusion to be drawn from [this type of example] will be that [it] is not really a 'semantically vacuous movement' " (2002: 84).

Additionally, Nishigauchi observes that (3) exemplifies the familiar argument/adjunct distinction noted for *wh*-movement in English (Lebeaux 1988; also see Freidin 1986, Van Riemsdijk and Williams 1981).

- (4) ??/\*[Which criticism of John<sub>i</sub>]<sub>j</sub> did he<sub>i</sub> reject t<sub>j</sub>?

<sup>2</sup> Long-distance scrambling is known to be solely  $\bar{A}$ -movement (Mahajan 1990, Saito 1992, Tada 1993, Yoshimura 1992). Local scrambling may be either  $\bar{A}$ - or A-movement. Presumably the  $\bar{A}$  property of local scrambling is equivalent to long-distance scrambling in terms of landing site, somewhere high in the structure. At least two proposals have been made about A-scrambling. Saito (1992) suggests that local scrambling is, in itself,  $\bar{A}$ -movement that adjoins an XP to TP. This TP-adjunction site is inherently an  $\bar{A}$ -position. There is an option of moving the verbal head to T at LF, turning the entire T projection into a V projection and thereby converting the TP-adjunction position into an A-position. In Miyagawa 2001 (see also Miyagawa 2003a), I suggest that the two orders, SOV and OSV, are both due to the EPP requirement on T. In the SOV order, S moves to Spec,TP, and in the OSV order, O moves to Spec,TP, allowing S to stay in situ in Spec,vP. The idea that the object may move into Spec,TP is due to Kuroda (1988) (also see Collins 1997); in Kuroda's theory, this is strictly an optional movement, as opposed to the obligatory EPP movement suggested in Miyagawa 2001. EPP-triggered movement is A-movement. In Miyagawa 2001, I give evidence that long-distance scrambling, which is solely  $\bar{A}$ -movement, cannot satisfy the EPP requirement of the T of the higher clause.

(5) [Which criticism that John<sub>i</sub> heard]<sub>j</sub> did he<sub>i</sub> believe t<sub>j</sub>?

Under Lebeaux's (1988) analysis, this contrast is due to the fact that *John*, which is an argument of *criticism* in (4), must be immediately merged with *criticism* when *criticism* first appears in the complement position of *reject*. Therefore, the entire phrase, *which criticism of John*, is construed in the original complement position, and the phrase in its entirety is visible as a copy in its original position. This leads to a Condition C violation. In contrast, (5) is fine. Lebeaux observes that *that John heard* is an adjunct, and he suggests that an adjunct, by its very nature, need not be immediately merged with the head of its phrase. Instead, *that John heard* can be late-merged after *which criticism* has undergone *wh*-movement to Spec,CP. In this way, the copy in the lower position is simply *which criticism*. A Condition C violation is therefore avoided (also see Chomsky 1993).

Nishigauchi (2002) notes that scrambling exhibits a similar argument/adjunct distinction. (The following is taken from Miyagawa 2005a.)

- (6) a. ??/?\*[Minna-no John<sub>i</sub>-no hihan-o]<sub>j</sub> kare<sub>i</sub>-ga [Hanako-ga t<sub>j</sub>  
[everyone-GEN John<sub>i</sub>-GEN criticism-ACC]<sub>j</sub> he<sub>i</sub>-NOM [Hanako-NOM t<sub>j</sub>  
osiete-kureta to] itta.  
told.him COMP] said  
'[Everyone's criticism of John], he said that Hanako told him.'
- b. [[Minna-ga John<sub>i</sub>-kara kakusite-ita] hihan-o]<sub>j</sub> kare<sub>i</sub>-ga  
[[everyone-NOM John<sub>i</sub>-from was.hiding] criticism-ACC]<sub>j</sub> he<sub>i</sub>-NOM  
[Hanako-ga t<sub>j</sub> osiete-kureta to] itta.  
[Hanako-NOM t<sub>j</sub> told.him COMP] said  
'The criticism that everyone was hiding from John, he said that Hanako told him.'

In (6a), the antecedent *John* occurs as an argument of the nominal head *hihan* 'criticism'. Following Lebeaux, *John* must be merged at the point when the nominal head is initially merged, in the complement position of *osiete-kureta* 'told'. A full copy of *John* is therefore visible in this position, and it leads to a Condition C violation. In (6b), on the other hand, *John* is contained in a relative clause, which is an adjunct. Again following Lebeaux, an adjunct can be late-merged—in this case, after the phrase headed by *hihan* 'criticism' has been scrambled to the head of the sentence. In this way, the relative clause containing *John* never occurs in the original position and a Condition C violation is avoided. Example (6b) clearly indicates that the scrambled phrase does not get put back. If it did, the entire phrase, [[*minna-ga John<sub>i</sub>-kara kakusite-ita*] *hihan-o*]<sub>j</sub> 'the criticism that everyone was hiding from John', would be interpreted lower in the structure, a configuration that incorrectly predicts a Condition C violation.<sup>3</sup>

<sup>3</sup> An anonymous reviewer points to the following pair as a possible counterexample to Nishigauchi's observation that there is a "Lebeaux-type" argument/adjunct distinction in Condition C environments under reconstruction. (I have changed the verb to more readily allow the scrambling in (ib).)

- (i) a. \*Kare<sub>i</sub>-ga [Hanako-ga [dono John<sub>i</sub>-no e]-o kiratteiru ka] siritagatteiru.  
he<sub>i</sub>-NOM [Hanako-NOM [which John<sub>i</sub>-GEN picture]-ACC hate Q] want.to.know  
'He wants to know which picture of John Hanako hates.'

The upshot of the above discussion is that scrambling of the type dealt with by Saito, and used crucially by BT and Bošković (2004), exhibits typical reconstruction/nonreconstruction properties associated with  $\bar{A}$ -movement (*wh*-movement). This suggests that scrambling is a straightforward  $\bar{A}$ -movement, like *wh*-movement, and that it involves nothing unusual in terms of  $\theta$ -marking, contrary to what BT and Bošković (2004) claim.

The analysis given above leaves one question: how is the *wh*-phrase scrambled out of the indirect question in Saito's original example licensed? We have seen evidence that it need not reconstruct back into the indirect question. To put it more concretely, how is this *wh*-phrase appropriately related to the [+wh] selection property on the indirect question C? Several possibilities have been proposed. One approach involves the unselective binding of the *wh*-phrase by Q (Tsai 1994). In this approach, before the phrase scrambles, the [+wh] feature on the *wh*-phrase enters into an agreement relation with the corresponding feature on C. The [+wh] selection requirement is thus met, and the *wh*-phrase is then free to move out of the indirect question. The second approach (Watanabe 1992; also see Hagstrom 1998) proposes that there is an empty *wh*-operator associated with the *wh*-phrase in Japanese that moves to C to satisfy the [+wh] selection requirement. This movement happens before scrambling of the *wh*-phrase takes place. Yet a third possibility is that the *wh*-phrase first moves to the specifier of the lower CP to meet the [+wh] selection requirement, a displacement that counts as an instance of *wh*-movement as argued by Takahashi (1993).<sup>4</sup> I will not attempt to argue for one approach over the others or for some other equally plausible analysis.<sup>5</sup> What we have observed so far does preclude one possibility: the

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- b. [Dono John<sub>i</sub>-no e]<sub>j</sub> kare<sub>i</sub>-ga [Hanako-ga t<sub>j</sub> kiratteiru ka] siritagatteiru.  
 [which John<sub>i</sub>-GEN picture]-ACC<sub>j</sub> he<sub>i</sub>-NOM [Hanako-NOM t<sub>j</sub> hate Q] want.to.know  
 Lit. 'Which picture of John, he wants to know Hanako hates.'

The reviewer notes that while (ia) straightforwardly violates Condition C, this violation is avoided in (ib). In (ib), according to the reviewer, the *wh*-phrase that contains *John* in the complement position has been scrambled. On the Lebeaux/Nishigauchi approach, this sentence should violate Condition C because *John* is a complement of *e* 'picture'. While I agree with the reviewer's grammaticality judgment of (ib), it isn't clear that this is a counterexample. The genitive marking on *John* can express all sorts of relations, particularly with a head such as *e* 'picture'. While the relation can be that of a complement, it can also be that of an adjunct (the picture is owned by John, etc.). This is why in (6) I use *hihan* 'criticism', which more clearly identifies the pronominal genitive phrase as its argument. With *hihan*, we observe the expected marginality, indicating that (ib) is not a counterexample to the Lebeaux/Nishigauchi observation.

- (ii) ??/\*[Dono John<sub>i</sub>-no hihan]-o<sub>j</sub> kare<sub>i</sub>-ga [Hanako-ga t<sub>j</sub> sinziteiru ka] siritagatteiru.  
 [which John<sub>i</sub>-GEN criticism]-ACC<sub>j</sub> he<sub>i</sub>-NOM [Hanako-NOM t<sub>j</sub> believe Q] want.to.know  
 Lit. 'Which criticism of John, he wants to know Hanako believes.'

<sup>4</sup> An anonymous reviewer comments that this third option is not plausible on the grounds that, after *wh*-movement, an additional  $\bar{A}$ -movement takes place that does not create an operator-variable chain. The question is, if this option turns out to be correct (and I am not committing to it), what is the function of the *wh*-phrase scrambling beyond *wh*-movement? One possibility is that the scrambling takes place for reasons of focus, which I will discuss in section 3; focus alteration does not require an operator-variable chain, so movement for reasons of focus answers the reviewer's concern about an  $\bar{A}$ -movement that does not create an operator-variable chain. Focus movements tend to be  $\bar{A}$ -movements in those languages where they can be observed overtly, although there are cases of A focus movement.

<sup>5</sup> One problem with Tsai's (1994) approach for present purposes is that Tsai assumes that unselective binding is available only for argument *wh*-phrases. An adjunct *wh*-phrase such as *naze* 'why' must undergo movement to meet the

classic approach to *wh*-in-situ proposed by Huang (1982) (also see Lasnik and Saito 1984). In this approach, the *wh*-in-situ moves at LF to the appropriate Spec,CP, in this case the specifier of the indirect question. If this indeed happened, the *wh*-phase would necessarily have to reconstruct, which we have seen is not the case. Saito (1989) assumed this classic approach, given that it was the leading account at the time for *wh*-in-situ. (See Miyagawa 2005a for further comments on this issue of *wh*-licensing in environments that Saito originally used to make his arguments.)

### 3 Undoing and Quantifier Scope

Another piece of evidence given for the undoing property of scrambling involves quantifier scope (BT 1998, Saito 2004). As noted by Oka (1989) and Tada (1993), a quantifier scrambled long-distance cannot be interpreted in its scrambled position; instead, it is interpreted in its original position (or some position lower than its scrambled position). BT (1998:354) give the following example:

- (7) Daremo-ni dareka-ga [Mary-ga *e* atta to] omotteiru.  
 everyone-DAT someone-NOM [Mary-NOM met COMP] thinks  
 ‘Everyone, someone thinks that Mary met.’  
 someone > everyone, \*everyone > someone

The failure of the quantifier to take scope in its scrambled position ostensibly reflects the undoing property—and, for BT and Bošković (2004), the idea that the scrambled phrase must lower at LF to be associated with a  $\theta$ -role.

The phenomenon we have just observed takes on a very different character when we expand the data. First, suppose, as has been suggested, that scrambling of a quantifier may count as an instance of overt QR (see Abe 2005, Kitahara 1995, Miyagawa 2003b, Sohn 1995, Tonoike 1997). Fox (2000) argues that QR is subject to what he calls Scope Economy.

- (8) *Scope Economy*  
 An SSO [scope-shifting operation] can move  $XP_1$  from a position in which it is interpretable only if the movement crosses  $XP_2$  and  $\langle XP_1, XP_2 \rangle$  is not scopally commutative.  
 (Fox 2000:26)

According to Scope Economy, optional QR is possible if it leads to a new scope relation. We can see this in Kuroda’s (1971) original observation about local scrambling (also see Hoji 1985). For many speakers, an example such as (9) is scopally unambiguous; it has only surface scope.

- (9) Dareka-ga daremo-o sikatta.  
 someone-NOM everyone-ACC scolded  
 ‘Someone scolded everyone.’  
 someone > everyone, \*everyone > someone

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[+wh] selection requirement. As BT observe (p. 356), however, the type of scrambling noted by Saito (1989) that extracts *wh*-phrases out of indirect questions is available for both arguments and adjuncts like *naze*.

If the object is scrambled to the left of the subject, the other possibility also exists: the object may take scope over the subject.<sup>6</sup>

- (10) Daremo-o<sub>i</sub> dareka-ga t<sub>i</sub> sikatta.  
 everyone-ACC<sub>i</sub> someone-NOM t<sub>i</sub> scolded  
 ‘Everyone, someone scolded.’  
 someone > everyone, everyone > someone

This is a case of local scrambling. What about long-distance scrambling? We saw that long-distance scrambling does not appear to alter the scope relation in (7). Is this always the case?

To set the stage, let us first look at relevant examples from English. May (1977) notes that QR is clause bound.

- (11) a. Someone loves everyone.  
       some > every, every > some  
       b. Someone thinks that Mary loves everyone.  
       some > every, \*every > some

There are exceptions to the clause-boundedness of QR, however. The following example, pointed out by Moltmann and Szabolcsi (1994), is discussed by Fox (2000:64):

- (12) a. One girl knows that every boy bought a present for Mary.  
       one > every, \*every > one  
       b. One girl knows what every boy bought for Mary.  
       one > every, every > one

Fox notes that in (12a), the movement of *every boy* to the lower Spec,CP (or its adjunction to this CP) does not lead to a new scope relation. Hence, Scope Economy does not license this movement. In (12b), moving the universal *every boy* over *what* does lead to a new scope relation: it makes a pair-list interpretation possible. This, then, sets up the movement of the universal quantifier to the matrix clause, where ultimately it may take scope over the existential.

Let us return to the Oka/Tada type of Japanese example noted by BT, repeated here:

- (13) Daremo-ni dareka-ga [<sub>CP</sub> t<sub>2</sub> Mary-ga t<sub>1</sub> atta to] omotteiru.  
 everyone-DAT someone-NOM [<sub>CP</sub> t<sub>2</sub> Mary-NOM t<sub>1</sub> met COMP] thinks  
 ‘Everyone, someone thinks that Mary met.’

<sup>6</sup> An anonymous reviewer finds the following example ambiguous:

- (i) Daremo-ga dareka-o aisiteiru.  
 everyone-NOM someone-ACC love  
 ‘Everyone loves someone.’

Here, the order of the two quantifiers in (9) is reversed, with the universal c-commanding the existential. It is well known that an existential can take wide scope from a position quite low in the structure; possibly this is because the quantificational force comes not from a lexical item like *dareka* ‘someone’ but from an existential quantifier located high in the structure (Heim 1982).

We can see immediately that the first link of the chain,  $\langle t_2, t_1 \rangle$ , violates Scope Economy. The universal quantifier only moves across the R-expression *Mary*; hence, it cannot take scope in its scrambled position. If Scope Economy is indeed what is responsible for the undoing property in this example, we predict that such undoing need not take place if the first movement is licensed.<sup>7</sup>

In fact, Abe (2005) has already observed that if another quantifier is in the right position, the long-distance scrambling of a quantifier may lead to a new scope relation, contrary to what Oka and Tada observed. Before introducing Abe's examples, which involve clefts, I will present "normal" sentences that demonstrate the property.

- (14) Daremo-ni<sub>i</sub> dareka-ga [John-ga t<sub>i</sub> kisu<sub>sita</sub> to] omotteiru.  
 everyone-DAT<sub>i</sub> someone-NOM [John-NOM t<sub>i</sub> kissed COMP] thinks  
 'Everyone, someone thinks that John kissed.'  
 \*everyone > someone, someone > everyone
- (15) Daremo-ni<sub>i</sub> dareka-ga [futari-no kodomo-ga t<sub>i</sub> kisu<sub>sita</sub> to] omotteiru.  
 everyone-DAT<sub>i</sub> someone-NOM [2-GEN kids-NOM t<sub>i</sub> kissed COMP] thinks  
 'Everyone, someone thinks that two kids kissed.'  
 OK/??everyone > someone, someone > everyone

Although there is a preference for the "reconstructed" ('some' > 'every') interpretation in both examples, the other interpretation ('every' > 'some') is available for many speakers in (15), but not in (14).<sup>8</sup> This difference comes from the fact that in (14) there is no quantificational expression in the subordinate clause other than the scrambled phrase, 'everyone'. Hence, Scope Economy would not license the movement of the quantifier in the lower CP. In (15), the subordinate subject is the quantificational expression 'two kids'; movement of the universal quantifier 'everyone' across this subject quantifier creates a new scope relation. This step is therefore licensed. The next step is also licensed because 'everyone' moves across another quantifier, 'someone'. For 'everyone' to take scope over the matrix 'someone', it must also take scope over the subordinate 'two kids', since that is the new scope relation that licenses the first step of the movement. We see, then, that the original fact observed by Oka (1989) and Tada (1993), which BT (1998) and Bošković (2004) point to as evidence for the undoing property, simply demonstrates Scope Economy at work. The observation was based on examples in which a quantifier moves in the lower clause without altering the scope relation, in violation of Scope Economy.

To my knowledge, Abe (2005) was the first to offer examples that illustrate the Scope Economy effect we just observed for scrambling. Although Abe's conclusions are somewhat

<sup>7</sup> In the derivation of the example in (13), the scrambled phrase must first move to the edge of its local, embedded clause, an indication that scrambling, like any ordinary movement, must move successive-cyclically (a fact captured recently in the notion "phase"; Chomsky 2001). Thanks to an anonymous reviewer for raising the issue of successive-cyclicality for  $\bar{A}$ -scrambling.

<sup>8</sup> I have consulted six native speakers, all linguists. None got the wide reading of 'everyone' in (14), as expected. They all got the wide reading of matrix 'someone' in both (14) and (15), again, as expected. Four of the six speakers got the crucial reading—the wide reading of 'everyone' over the matrix 'someone' for (15)—although one said that it was somewhat difficult. Of the remaining two speakers, one did not get the crucial reading at all, and one could not determine whether it is available or not.

different from mine, we share the idea that the Oka/Tada observation is an insight about when QR is, and is not, possible as scrambling. Abe's examples (2005:34) are cleft constructions, shown here.

- (16) [Daremo-ga [sensee-ga  $t_i$  kiskusita to] sinziteiru no]-wa dareka  
[everyone-NOM [teacher-NOM  $t_i$  kissed COMP] believe COMP]-TOP some  
seeto-ni<sub>i</sub> da.  
student-DAT<sub>i</sub> be  
'It is some student that everyone believes that the teacher kissed.'

- (17) [Sensee-ga [daremo-ga  $t_i$  kiskusita to] sinziteiru no]-wa dareka  
[teacher-NOM [everyone-NOM  $t_i$  kissed COMP] believe COMP]-TOP some  
seeto-ni<sub>i</sub> da.  
student-DAT<sub>i</sub> be  
'It is some student that the teacher believes that everyone kissed.'

To quote Abe (2005:52), "[w]hile it is hard to get the reading in which *daremo* ['everyone'] takes scope over *dareka* ['someone'] in [(16)], such a reading is easily available for [(17)]." The difference is that in (17), the first movement within the lower clause crosses a quantifier, *daremo* 'everyone', in the lower clause, which, as we saw earlier, satisfies Scope Economy. No quantifier occurs in the lower clause in (16), so the movement inside the lower clause violates Scope Economy.

The movement in these cleft constructions is operator movement (Hoji 1985). While (16) demonstrates the Oka/Tada effect of undoing, (17) does not. But one might argue that this is independent of scrambling because the movement is not scrambling per se. We can see that Abe's observations are directly relevant to scrambling by noting a direct correlation between clefts and scrambling. The following are cleft versions of examples (14) and (15):

- (18) [Dareka-ga [John-ga  $t_i$  kiskusita to] omotteiru no]-wa daremo-ni<sub>i</sub> da.  
[someone-NOM [John-NOM  $t_i$  kissed COMP] thinks COMP]-TOP everyone-DAT<sub>i</sub> be  
'It is everyone that someone thinks that John kissed.'  
\*everyone > someone, someone > everyone

- (19) [Dareka-ga [futari-no kodomo-ga  $t_i$  kiskusita to] omotteiru no]-wa  
[someone-NOM [2-GEN kids-NOM  $t_i$  kissed COMP] thinks COMP]-TOP  
daremo-ni<sub>i</sub> da.  
everyone-DAT<sub>i</sub> be  
'It is everyone that someone thinks that two kids kissed.'  
OK??/everyone > someone, someone > everyone

As shown, the pattern of scope possibilities is the same as with the original pair. One speaker who finds a clear distinction between (14) and (15) commented that the cleft construction makes the contrast even sharper. These examples again demonstrate that scrambling of the type dealt

with by Saito (1989) and BT is not some unusual and unique operation, but simply an operation subject to familiar universal conditions on movement.

#### 4 Scrambling of R-Expressions

We have seen that the scrambling of a quantifier is subject to Scope Economy. What about scrambling of an R-expression? I will demonstrate that another consideration—focus—counts as ‘‘having an effect on the outcome,’’ therefore licensing optional movement (see Chomsky 2001, Fox 2000, Miyagawa 2005a).

As noted by Neeleman and Reinhart (1998), scrambling changes the focus potential of a sentence (also see, e.g., Bailyn 2001, 2003, Ishihara 2001, Jung 2002, Miyagawa 1997, 2005b, Otsuka 2005, Yang 2004). Ishihara (2001) illustrates this for Japanese. Let us begin with normal SOV word order.

- (20) Taroo-ga [<sub>VP</sub> *hon-o* katta].  
 Taro-NOM [<sub>VP</sub> book-ACC bought]  
 ‘Taro bought a book.’

The focus here is on the object *hon* ‘book’, which is the phrase that bears the nuclear stress. According to Neeleman and Reinhart’s (1998) Focus Rule, which allows focus to project upward from the focused element, the focus domain of this sentence may be the object *hon*, the VP that contains it, or the entire TP. Thus, (20) can be used as an answer to the following three questions:

- (21) a. What happened? (focus on TP)  
 b. What did Taro do? (focus on VP)  
 c. What did Taro buy? (focus on object)

(22) has a different focus domain set because of the scrambling of the object.

- (22) Hon-*o*<sub>i</sub> Taroo-ga [<sub>VP</sub> *t*<sub>i</sub> katta].  
 book-ACC<sub>i</sub> Taro-NOM [<sub>VP</sub> *t*<sub>i</sub> bought]

With neutral prosody, the focus domains are the subject NP *Taroo* and the TP; but the VP cannot be a focus domain because it does not contain the stress. Therefore, (22) cannot be used to answer *What did Taro do?* Let us assume, quite plausibly, that altering the focus potential of a sentence counts as having an ‘‘effect’’; hence, this new focus potential can license optional movement.<sup>9</sup>

<sup>9</sup> Ishihara (2001) makes two assumptions about (22). First, as argued in Miyagawa 2001, the object in an OSV clause may move into Spec,TP to satisfy the EPP requirement of T. Second, V-to-T movement takes place (see Koizumi 1995, Otani and Whitman 1991), so that in (21), the lowest element is the subject in the Spec,VP. This is why the subject receives the nuclear stress, and this fact constitutes an argument that the verb raises in Japanese. In Dutch, where there is no overt verb movement, scrambling of the object leads to the nuclear stress being assigned to the verb, which is the lowest element in the structure, unlike in Japanese. See Fukui and Takano 1998, Fukushima 2003, Sakai and Fukui 2003, and Takano 1996, among others, for arguments that the verb does not raise in Japanese.

Now consider the following example:

- (23) Hanako-ga [<sub>CP</sub> Taroo-ga hon-o katta to] itta.  
 Hanako-NOM [<sub>CP</sub> Taro-NOM book-ACC bought COMP] said  
 ‘Hanako said that Taro bought a book.’

This sentence can be used to answer the following three questions, among others:

- (24) a. What happened? (focus on matrix TP)  
 b. What did Hanako do? (focus on matrix VP)  
 c. What did Hanako say? (focus on complement CP)

Now consider the following long-distance scrambling of the subordinate object, which is an ordinary nominal expression (*hon* ‘book’):

- (25) Hon-o<sub>i</sub> Hanako-ga [<sub>CP</sub> t<sub>i</sub> Taroo-ga t<sub>i</sub> katta to] itta.  
 book-ACC<sub>i</sub> Hanako-NOM [<sub>CP</sub> t<sub>i</sub> Taro-NOM t<sub>i</sub> bought COMP] said  
 Lit. ‘Book, Hanako said that Taro bought (it).’

A natural way to pronounce this sentence is to put focus stress on the long-distance-scrambled *hon-o* ‘book-ACC’. This scrambled embedded object is naturally pronounced with contrastive focus, although it is not clear to me whether contrastive focus is the only type of focus available. In any event, on this contrastive focus interpretation, this sentence cannot be used to answer any of the three questions in (24) naturally. This is because the focus is not in the complement CP, (24c); it is also not in the matrix VP, (24b); and it is not in the immediate matrix TP, (24a), because the long-distance-scrambled embedded object is adjoined to the matrix TP (Saito 1985) or possibly located in the specifier of the matrix CP. This sentence is a natural candidate as a response to a question such as ‘What did Hanako say that Taro bought?’ with *wh*-phrase ‘what’ having been scrambled to the head of the sentence. There are other possible questions and statements that (25) can be used to respond to, but the important point is that the long-distance scrambling of the embedded object clearly changes the focus potential, which indicates that this optional movement has an effect on the output.

Finally, let us return to the original example (repeated here) that demonstrates the Oka/Tada observation.

- (26) Daremo-ni dareka-ga [Mary-ga *e* atta to] omotteiru.  
 everyone-DAT someone-NOM [Mary-NOM met COMP] thinks  
 ‘Everyone, someone thinks that Mary met.’  
 someone > everyone, \*everyone > someone

I have argued that the failure of the universal quantifier to take scope in its scrambled position is due to Scope Economy: movement of the universal quantifier to the edge of the embedded CP is not licensed by Scope Economy. But the question then arises, what exactly is the nature of the long-distance scrambling in (26)? A plausible approach is to consider (26) in the light of the

focus-altering property of scrambling.<sup>10</sup> In (26), the optional movement of *daremo-ni* ‘everyone-DAT’ from the embedded clause to the matrix clause alters the focus set, as we saw earlier for the same movement involving an R-expression. Focus alteration licenses the scrambling in (26) as an optional operation, but the operation is not licensed as a means of altering the scope relation. This is why the scrambling in (26) does not lead to a new scope relation. It cannot alter the scope relation because, as we saw in section 3, the movement of the quantifier *daremo-ni* ‘everyone-DAT’ within the embedded CP does not alter scope, hence cannot be licensed on the basis of scope. It can, however, be licensed on the basis of focus, as we saw in the discussion of scrambling an R-expression.<sup>11</sup> Consequently, the Oka/Tada example, which BT (1998) and Bošković (2004) point to as evidence for the undoing property (also see Sauerland and Elbourne 2002), is a bona fide optional operation that is licensed under focus alteration but not under scope alteration.<sup>12</sup>

### 5 Saito’s (1989) Original Example

One final point. Let us look again at the crucial example in Saito’s (1989) classic argument for the undoing property of scrambling.

- (27) ?Nani-o<sub>i</sub> John-ga [WH-ISL Taroo-ga t<sub>i</sub> katta ka] siritagatteiru.  
 what-ACC<sub>i</sub> John-NOM [WH-ISL Taro-NOM t<sub>i</sub> bought Q] want.to.know  
 ‘John wants to know what Taro bought.’

Contrary to Saito’s claim, we have seen evidence that the *wh*-phrase that is scrambled long-

<sup>10</sup> I am grateful to an anonymous reviewer for suggesting this solution.

<sup>11</sup> In Miyagawa 2005a, I suggest that (26) is a genuine instance of radical reconstruction, in which the quantifier is obligatorily put back in its original position at LF *because this movement is illicit*. I now revise this view to the one presented in the text, that the scrambling in (26) is licensed on the basis of focus, but not on the basis of scope. As an anonymous reviewer points out, this is a more plausible approach, one that gets rid of an unnecessary complication in the analysis.

<sup>12</sup> Another argument given by Bošković (2004) and BT (1998) is based on the observation that adjuncts cannot scramble. In (i) (from Saito 1985:175), the adjunct ‘without any reason’, which has ostensibly been scrambled to the matrix clause from the embedded clause, cannot be interpreted as part of the embedded clause.

- (i) Riyuu-mo naku Mary-ga [John-ga e sono setu-o sinziteiru to] omotteiru.  
 reason-even without Mary-NOM [John-NOM that theory-ACC believe COMP] think  
 ‘Mary thinks that John believes in that theory without any reason.’

In BT’s and Bošković’s system, the absence of the “reconstructed” interpretation of ‘without any reason’ follows from the idea that a scrambled element is put back at LF because of  $\theta$ -role considerations. By nature, an adjunct is not associated with a  $\theta$ -role; hence, it does not reconstruct. While I agree that the adjunct in (i) is difficult to interpret in the embedded clause (although it’s not clear to me that the reading is impossible), there are other examples where this construal is much easier. Consider (ii).

- (ii) ?Naze<sub>i</sub> kimi-wa [Hanako-ga t<sub>i</sub> sigoto-o yameta to] omotteiru no?  
 why<sub>i</sub> you-TOP [Hanako-NOM t<sub>i</sub> job-ACC quit COMP] think Q  
 ‘Why do you think Hanako quit her job?’

I have consulted a handful of native speakers and they all were able to get the “reconstructed” interpretation, although it is obviously the less preferred one.

distance does not need to be “undone.” The example given by Nishigauchi (2002) (from Lasnik and Saito 1999) is repeated here:

- (28) John<sub>i</sub>-ni-tuite-no dono hon]<sub>j</sub>-o<sub>j</sub> kare<sub>i</sub>-ga [Hanako-ga t<sub>j</sub> ki-ni-itte iru ka] sitte-iru.  
 [John<sub>i</sub>-about-GEN which article]-ACC<sub>j</sub> he<sub>i</sub>-NOM [Hanako-NOM t<sub>j</sub> like Q] knows  
 ‘He knows which book about John, Hanako likes.’

In this example, the antecedent, *John*, is inside an adjunct clause within the *wh*-phrase. As a result, the sentence escapes violating Condition C, assuming that the entire *wh*-phrase does not reconstruct.

The question is, what motivates the movement? Note that what has moved is a *wh*-phrase, not an R-expression, and it moves over an R-expression (*John*), so that no new scope relation is created.

What I detect in this movement is that the *wh*-phrase is interpreted as a kind of partitive. If we reflect on (27), the *wh*-phrase *nani* ‘what’ is most easily interpreted as ‘among the things we are talking about, John wants to know which of them Taro bought’.<sup>13</sup> No such reading is available—or at least required—in the nonscrambled version. I suggest that this partitive interpretation is a manifestation of what Pesetsky (1987) has called D-linking, whereby certain *wh*-phrases, most notably the *which X* type, have a property that they presuppose a salient set of objects or people in the discourse context from which the hearer is asked to choose.

One place where D-linking has been identified is in pair-list interpretation (e.g., Comorovski 1996, Hornstein 1995). Consider (29).

- (29) Who bought what?

This is most naturally interpreted as a pair-list question. What has been pointed out is that in this example, *who* is normally D-linked, in that there is a presupposed set of people, and for each member of this set, the answerer must specify what that person bought. A particularly cogent example of this need for D-linking is given by Bolinger (1978) (see Comorovski 1996).

- (30) a. It’s nice to have all those times scheduled, but when are you doing what?  
 (#But what are you doing when?)  
 b. It’s nice to have all those activities ahead of you, but what are you doing when?  
 (#But when are you doing what?)

In (30a), the discourse establishes *all those times* as a topic, so that *when* can “link” to this discourse topic—in other words, so that it can be D-linked. *What* is understood as ranging over the possible *whens* that are known in the conversation. As indicated in the parentheses, reversing the order to *what . . . when* in this context is distinctly odd because *what* does not link to a discourse topic, hence is not D-linked.

Returning to Japanese, let us look at an example that parallels the English example *Who bought what?*

<sup>13</sup> Thanks to an anonymous reviewer for suggesting this English gloss.

- (31) Dare-ga nani-o katta no?  
 who-NOM what-ACC bought Q  
 ‘Who bought what?’

The most natural way to interpret this is that there is a presupposed set of people, and for each member of the set, the speaker wants to know what that person bought.<sup>14</sup> Now, let us see what happens if we scramble the object *wh*-phrase *nani* ‘what’.

- (32) Nani-o<sub>i</sub> dare-ga t<sub>i</sub> katta no?  
 what-ACC<sub>i</sub> who-NOM t<sub>i</sub> bought Q  
 ‘What, who bought?’

This is not *wh*-movement, but simply an instance of scrambling. What is noteworthy is that in this example, it is possible to interpret the scrambled *nani* as referring to a presupposed set of objects, and for each object, the hearer is supposed to answer who bought it.<sup>15</sup> This is consistent with the idea advanced in Miyagawa 2005b that scrambling has some kind of effect on interpretation in virtually all cases (also see Bailyn 2003, Jung 2002, Otsuka 2005).

Given what we have seen, it is not at all surprising that Saito’s (1989) original example, in which a *wh*-phrase is scrambled long-distance, is an instance of proper movement: the *wh*-phrase becomes D-linked. This is why the *wh*-phrase can be interpreted as well as pronounced in the final, scrambled position.

## 6 Concluding Remarks

In these remarks, I argued against the LF lowering analysis of scrambling as proposed in Bošković and Takahashi 1998 and defended in Bošković 2004. In so doing, I showed that scrambling of the type that BT discuss is “normal”  $\bar{A}$ -movement subject to universal conditions on  $\bar{A}$ -movement. While BT’s attempt to reduce scrambling to a last resort phenomenon is admirable, the evidence points in other directions if we wish to characterize scrambling as a motivated operation in some fashion. I suggested that optional movements such as scrambling must be motivated in terms of “effect on the output” (Fox 2000, Reinhart 1995; also see Chomsky 2001).

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<sup>14</sup> An anonymous reviewer asks whether the object *wh*-phrase in this example could be the D-linked phrase, so that it acts as the “anchor” for pair-list questions. This linkage does not seem to be impossible, although my feeling is that it requires a special focus on the object *wh*-phrase, something I do not understand. I leave this question open.

<sup>15</sup> Hagstrom (1998) points out that “antisuperiority” sentences such as (32) are associated only with a single-pair interpretation, not with a pair-list interpretation. Hagstrom’s observation is correct for (32), but only if focus stress is placed on the scrambled *wh*-phrase *nani* in sentence-initial position. If there is no such stress on the first *wh*-phrase, a pair-list interpretation is possible.

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