Scrambling and Last Resort

Željko Bošković
Daiko Takahashi

Under the standard analysis (e.g., Fukui 1993, Saito 1985, 1992), scrambling in Japanese raises a serious problem for the last resort view of Move α, since it is considered to involve optional overt movement that has no driving force. In this article we propose a new analysis of scrambling that puts scrambling in conformity with the Last Resort principle. We argue that scrambled elements are base-generated in their surface non-θ-positions and undergo obligatory LF movement to the position where they receive θ-roles, which we consider to be formal features capable of driving movement. We show that our LF analysis of scrambling is both conceptually and empirically superior to the standard optional overt movement analysis.

Keywords: A/Ā distinction, Japanese, Last Resort, lowering, scrambling, θ-roles

In this article we show how the status of LF lowering and movement into θ-positions in the minimalist framework opens up a new way of analyzing scrambling that is both conceptually and empirically superior to previous accounts. In section 1 we discuss the status of lowering and movement into θ-positions in the current theory. In sections 2–4 we examine scrambling. Section 5 is the summary.

1 Lowering and Movement into θ-Positions

Lowering is allowed by Affect α in the absence of a stipulation that would explicitly prohibit it. The stipulation might take the form of an independent principle, or it might be part of the definition of movement. However, positing such a stipulation is problematic for two reasons: it unnecessarily complicates the theory, and it is to a considerable extent redundant with respect to other constraints. As noted by Lasnik and Saito (1984, 1992), most constructions involving lowering are ruled out quite independently of how they are derived. For example, English (1) and Chinese (2a), the LF representation of which under the relevant reading (assuming LF *wh*-movement) is given in (2b), are ruled out by the ban on vacuous quantification and the Proper Binding Condition.[1]

[1] Notice also Lasnik and Saito's (1992) example (i), which cannot be ruled out by any kind of ban on lowering,

(1) *John asked t_1 [$_{CP}$ who$_1$ Mary slept].

(2) a. *Zhangsan wen shei Lisi shuei-zhao le.
         Zhangsan ask who Lisi slept   ASP
   b. *Zhangsan wen t_1 [$_{CP}$ shei$_1$ Lisi shuei-zhao le].

Chomsky (1995:254) observes that all instances of overt lowering can be ruled out by appealing to considerations of linear ordering. (The same holds for overt countercyclic raising.) Given Kayne's (1994) theory of word ordering and Epstein's (in press) theory that treats c-command as the relation holding between α and elements of β when α is attached to β by Merge or Move, if α is attached to an embedded category, it will enter into no c-command relation with any ''higher'' element β. As a result, no order between α and β will be established, causing a PF crash. We conclude, therefore, that all overt lowering and all lowering of operators (or, more precisely, elements that are forced to leave traces by independent principles of the grammar), are independently ruled out. Given this, positing a condition specifically banning lowering would be vastly redundant and would unnecessarily complicate the theory. A theory without such a condition is clearly conceptually more appealing. This view was very often explicitly adopted in the pre-minimalist literature (e.g., Fiengo 1974, 1977, Chomsky 1976, 1981, Lasnik and Saito 1984, 1992, Lasnik and Uriagereka 1988, May 1977, 1985). The Minimalist Program clearly has not changed anything in the relevant respect, except that the way overt lowering is ruled out in Chomsky 1995 makes any stipulation explicitly banning lowering even more redundant, hence conceptually even more problematic. Furthermore, as far as we can see, positing a ban on lowering in addition to the above independently needed mechanisms has no empirical advantages. We are not aware of any ungrammatical construction that cannot be ruled out unless lowering is explicitly prohibited. An explicit ban on lowering would thus not only represent an additional stipulation (thereby making the theory ''uglier'') and be vastly redundant, it simply would not do anything. Consequently, lowering should be allowed to the extent that its results do not violate independently motivated conditions of the grammar.

Let us now turn to movement into θ-positions. Such movement was assumed not to be possible in the preminimalist system. Prohibiting it was straightforward. By the Projection Principle and the θ-Criterion, all θ-roles must be assigned at D-Structure. Movement into θ-positions is then prevented from taking place for a trivial reason: there are no empty θ-positions when Move applies. Movement into a filled θ-position, ''erasing'' the element that previously occupied it, violates recoverability of deletion and the Projection Principle (different elements bear the same θ-role at different levels of representation).

This way of ruling out movement into θ-positions is not available in the minimalist framework, which, owing to the paucity of its theoretical mechanisms, has often led to fruitful reexaminations of old beliefs. Since the minimalist framework dispenses with D-Structure and S-Structure,

---

given the derivation in which the AP is preposed after the movement of *there*. The construction is, however, readily ruled out by the Proper Binding Condition.

(i) *[$_{AP}$ How likely t_i to be a riot]$_j$ is there$_i$ t_j?

the θ-Criterion and the Projection Principle cannot be checked before LF. The operation Move then applies before θ-positions are required to be filled by the θ-Criterion and the Projection Principle. Unlike in the preminimalist framework, there is then nothing in the current theory that is intrinsically incompatible with movement into θ-positions. Certainly, one can always find a way of banning such movement.[2] Our point is that it is even easier to allow it, which was not even a possibility in Government-Binding Theory. This seems desirable, given that it has been argued in several recent works that there are grammatical instances of movement into θ-positions (see Bošković 1994, 1997b, Lasnik 1995b).[3] In fact, even researchers in the Government-Binding tradition have often noted cases that appear to involve movement into θ-positions. Such cases were most often relegated to footnotes (see, e.g., Baker 1989:fn. 14, Burzio 1986:389–390fn. 36), since the theory was ill equipped to deal with them. By contrast, the current theory can handle them easily (see Bošković 1994 for much relevant discussion); this is particularly obvious if θ-roles are considered formal features, certainly a logical possibility, since then one would expect them to be capable of driving movement. Lasnik (1995c) and Kim (1997) present such analyses.[4] We will explore this possibility further below.

2 Case Study: Scrambling

So far we have shown that covert lowering and movement into θ-positions are not intrinsically incompatible with the minimalist framework. In this section we will argue that this is desirable. Using scrambling in Japanese as a case study, we will show that the possibility of lowering and movement into θ-positions conspire to provide a new account of scrambling that explains a number of its otherwise puzzling properties.[5]

It has been standard since Harada 1977 and Saito 1985 to view the following sentences as being transformationally related, the second sentence being derived from the first by an overt movement operation:

(3) a. John-ga [Mary-ga sono hon-o katta to] omotteiru.
   John-NOM Mary-NOM that book-ACC bought that thinks
   'John thinks that Mary bought that book.'
  b. Sono hon-o John-ga [Mary-ga *t* katta to] omotteiru.

Saito (1985) argues that (3b) is derived from (3a) by adjoining the embedded object to the matrix S (IP).

---

[2] See, for example, Chomsky 1995:313.

[3] See the same works for discussion of how disallowed instances of such movement are ruled out; for reasons of space, we omit this discussion here.

[4] See also Lasnik 1996, where it is argued that θ-roles must be checked in the course of a derivation, because the relevant structural configurations are sometimes not present in LF. This is consistent with the formal features view of θ-roles, but not, for example, with Chomsky's (1995) position that θ-roles are configurations.

[5] The analysis developed here is primarily intended to cover the traditional long-distance Ā-scrambling. (The discussion in sections 2 and 3 is in fact confined to this type of scrambling.) However, in section 4 we will briefly discuss the traditional short-distance A-scrambling, showing how our analysis can accommodate it.

This movement operation, or *scrambling* in the usual terminology, is not amenable to Chomsky's (1986b, 1993) conception of movement as a last resort operation, applying only when necessary.[6] For instance, (4a–b) violate the Last Resort principle, since *Mary* has already received Case prior to movement so that its movement to another A-position is deemed superfluous.

(4) a. *Mary seems to *t* that she is smart.
    b. *the belief Mary to seem to *t* that she is smart

From the viewpoint of the Last Resort principle, scrambling of *sono hon-o* in (3b) is exceptional, since it does not seem to be needed in any sense. First, (3a), the movementless counterpart of (3b), is perfectly grammatical. Second, unlike *wh*-movement and topicalization, scrambling of *sono hon-o* does not establish an operator-variable relation, as Saito (1989, 1992) convincingly shows (see section 3). Third, it is not triggered by Case requirements, partly because *sono hon-o* receives Case without movement in (3a), and partly because its locality is different from that of A-movement, as Mahajan (1990) and Saito (1992) show. (We turn to A-scrambling in section 4.)

Two ways of approaching the problem have recently been proposed. Fukui (1993) and Fukui and Saito (1992) devise a theory of optionality according to which certain movement operations, including scrambling, are deemed costless for the purpose of economy, so that they may take place without a trigger. Saito (1994) modifies this analysis by proposing that scrambling is licensed by virtue of its contribution to phrase structure construction. As in Fukui 1993 and Fukui and Saito 1992, under Saito's (1994) analysis scrambling is still essentially exempt from the Last Resort principle.

Without discussing Fukui's and Saito's analyses in further detail, we will propose an alternative solution to the problem that scrambling poses for the Last Resort principle, which will make scrambling fully consistent with this principle. Fukui and Saito share the assumption that scrambling is overt movement. We radically depart from them in denying this assumption; we propose instead that ''scrambled'' phrases are directly base-generated in their surface positions and undergo LF movement (lowering in most cases, but see section 3) to the positions where they receive θ-roles.[7] This is illustrated in the following derivation of (3b):

(5) Numeration → (a) → (c) (LF); → (b) (PF)
    a. [$_{IP}$ Sono hon-o   [$_{IP}$ John-ga   [$_{CP}$[$_{IP}$ Mary-ga   [$_{VP}$[$_V$ katta]]] to] omotteiru]]
          that book-ACC   John-NOM   Mary-NOM   bought that thinks
    b. sono hon-o John-ga Mary-ga katta to omotteiru
    c. [$_{IP}$ John-ga [$_{CP}$[$_{IP}$ Mary-ga [$_{VP}$ sono hon-o [$_V$ katta]]] to] omotteiru]

---

[6] For present purposes we assume that the Last Resort principle is Greed (Chomsky 1993, Bošković 1997b), rather than Enlightened Self-Interest (Lasnik 1995a,b). The choice between the two does not affect the content of this article, however.

[7] An important predecessor of ours with respect to this analysis is Kitagawa (1990), who also argues that traditional scrambling may involve LF lowering. However, the execution of the idea, including the driving force behind the lowering, the contexts in which lowering applies, and the evidence for the lowering, is quite different in this work.

The embedded object *sono hon-o* is directly introduced into the matrix IP-adjoined position by Merge and remains there in the PF side of the derivation.[8] The sentence would be anomalous if the object, an argument, stayed ''in situ'' at LF, since it would not receive a θ-role. Therefore, in the LF component the object lowers to the embedded VP-complement position to be θ-marked by the embedded verb,[9] thus ensuring the grammaticality of the construction.

This derivation is licit in the current system. Recall that overt lowering and lowering of elements that for independent reasons must leave traces are disallowed. Given the discussion in section 1, the case under consideration is exactly the context in which lowering is still allowed (i.e., it fits into the narrow margin of operation still left for lowering). Since the movement is taking place covertly, it is unaffected by Chomsky's (1995) claim that lowering (as well as overt countercyclic raising) is ruled out by considerations of linear ordering, which are irrelevant in LF. (In fact, Chomsky himself explicitly notes that, unlike in overt syntax, lowering and countercyclic raising are possibilities in LF. For more examples of LF lowering, see Bošković 1997b and May 1977, 1985.) We follow Lasnik and Saito (1992) in assuming that movement does not have to leave a trace when no principle requires it. Then, the LF movement deriving (5c) does not have to leave a trace, rendering the Proper Binding Condition inapplicable. The ban on vacuous quantification is also irrelevant here.

There is also nothing wrong with respect to θ-theory in (5). Given that in the minimalist system LF is the only place where thematic requirements must be satisfied, nothing in (5) violates the thematic requirements of the relevant elements, the embedded object being located right in the canonical object position at LF. The derivation involves movement into a θ-position, which, as discussed above, is a possibility in the current theoretical system. The assumption we are adopting here is that θ-roles are formal features and are therefore capable of driving movement, a position also maintained by Lasnik (1995c) and Kim (1997) (see also footnote 4).[10]

Under the proposed analysis, the only movement operation that *sono hon-o* undergoes in the derivation of (3b) is obligatory feature-licensing-driven LF lowering of the embedded object

---

[8] In a theory that allows multiple specifiers (Chomsky 1995), *sono hon-o* could be generated in an additional [Spec, IP]. We see no real empirical consequences of the choice between an additional [Spec, IP] and IP-adjunction. In adopting the adjunction option, we are merely following the standard assumption that scrambling involves adjunction. Note, however, that if the availability of scrambling crosslinguistically depends on the possibility of base-generating NPs in a pre-[Spec, IP] position, a possibility considered below, the multiple-[Spec, IP] analysis may be more appropriate than the adjunction analysis, given that the multiple-specifier option is open to parametric variation (see Chomsky 1995).

[9] If, as Jang (1995) argues, all θ-marking takes place under specifier-head agreement, *sono hon-o* would move to the embedded [Spec, VP].

[10] Strictly speaking, lowering of *sono hon-o* in (3b) may be triggered by the need for the NP to be Case-checked. (Note in this respect that Lasnik (1995a) and Bošković (1997b) argue that V in Agr$_O$ and NP in [Spec, Agr$_O$P] are in a Case-licensing as well as a θ-licensing configuration, as a result of which direct object NPs can be Case-licensed and θ-licensed in the same position.) Although Case may serve as a driving force for LF lowering of scrambled NP arguments, it cannot be a trigger for LF lowering of scrambled PP arguments, which do not need Case.

(i) Tukue-ni John-ga [Mary-ga *t* hon-o   oita to] itta.
 desk-on John-NOM Mary-NOM book-ACC put that said
 'On the desk, John said that Mary put a book.'

Since Case cannot be the sole reason for LF lowering of scrambled arguments, we will put aside the possibility that LF lowering of NP arguments may be Case-driven. An alternative is to consider elements such as *ni* in (i) to be Case particles rather than prepositions, a move that would make it possible to use Case to motivate LF lowering of ''scrambled'' phrases.

to its θ-position. The proposed analysis thus makes scrambling fully consistent with the Last Resort principle.

Now, should the ''scrambling derivation'' in (5), which inserts *sono hon-o* in the IP-adjoined position, be blocked by the derivation that inserts *sono hon-o* in the lowest V-complement position as in (3a)? Under the global view of economy of derivation this should be the case, since—as a result of the LF lowering of *sono hon-o*—the ''scrambling derivation'' is longer than the ''nonscrambling derivation'' in terms of nodes crossed. Bošković (in press b), Chomsky (1995), and Collins (1995), however, argue that derivations should not be compared on the basis of global length or cost. According to them, at a particular point X the decision about whether a particular operation will apply should be made only on the basis of information available at X. No look-ahead is allowed. As a result, a derivation can be ruled out via the notion of economy only if at a particular point in the derivation an alternative operation is available that is less costly *at that point*. Under this conceptually appealing view of economy of derivation, which eliminates globality from the comparison of derivations, the ''scrambling derivation'' in (5) and the ''nonscrambling derivation'' in (3a) are equally economical, since inserting *sono hon-o* in the matrix IP-adjoined position is no less economical than inserting it in the lowest V-complement position.[11]

Before we discuss evidence favoring the proposed analysis of scrambling over alternative analyses, let us consider why scrambling is disallowed in English. In our analysis two conditions are necessary for the existence of scrambling: one is that an argument may be base-generated in an IP-adjoined position, and the other is that an argument may move to a θ-position in LF. We can capitalize on the first condition, assuming with Saito (1989) that the IP-adjoined position can be base-generated in Japanese, but not in English. We leave it open here what this difference could follow from. For relevant discussion, see Fukui 1986, Fukui and Saito 1992, Kuroda 1988, and Saito 1989. Saito (1989) bases this assumption on the presence of the multiple-subject construction in Japanese and its absence in English.[12]

Alternatively, we may have recourse to the second necessary condition for scrambling, assuming that, unlike Japanese, English requires θ-positions to be filled in overt syntax. To use Chomsky's (1993, 1995) terminology, this would mean that θ-roles are weak features in Japanese, whereas they are strong features in English. As a result, θ-roles need not be assigned or, more precisely, checked before LF in Japanese, whereas they must be assigned or checked in overt syntax in English. We leave the choice between these possibilities open here, assuming either or both to be correct. Note, however, that the latter possibility may be more in line with current assumptions concerning crosslinguistic variation.[13]

---

[11] It is possible that no features are checked upon insertion in either case, θ-features being weak in Japanese, as discussed below. In both cases, however, the insertion of *sono hon-o* is a step toward a well-formed representation since it decreases the number of lexical items remaining in the numeration. (It satisfies Collins's (1995) Integration.)

[12] Notice, however, that one should not make too tight a connection between the possibility of scrambling and multiple-subject constructions since there are scrambling languages that do not allow such constructions, for example, Slavic languages and German.

[13] On the basis of properties of the pseudogapping construction, Lasnik (1995c) independently reaches the conclusion that θ-roles are formal features and that they are strong in English. (Chomsky (1994:39) also explores the possibility that θ-roles are formal features.)

We should point out here that adopting the θ-theoretic account of the presence versus absence of scrambling in

Before turning to empirical evidence for our analysis, we should note certain similarities between this analysis and Hale's (1983) analysis of scrambling developed with respect to Warlpiri. Under both analyses, scrambled elements are inserted directly into the position they occupy in overt syntax (Phrase Structure in Hale's terminology); they do not undergo overt movement. Moreover, under both analyses the θ-Criterion fails to be satisfied in overt syntax in scrambling languages; instead, it is satisfied at another level of representation, Lexical Structure in Hale's analysis and LF in our analysis. LF thus plays a similar role in our analysis to Lexical Structure in Hale's analysis. However, our analysis differs from Hale's in three important respects. First, our analysis enables us to state the difference between Japanese and English in terms of feature strength in line with current assumptions concerning crosslinguistic variation, whereas Hale's (non)configurationality parameter has no place in the current theory. Second, the mapping between overt syntax and LF is mediated by a familiar movement operation in our system, but the mapping between Phrase Structure, which is nonconfigurational, and Lexical Structure, which is configurational, is done in a rather obscure way in Hale's system. Third, unlike under Hale's analysis, under our analysis scrambling languages are fully configurational. Nonetheless, the similarity between Hale's (1983) analysis and ours is apparent, and in that respect the latter can be considered a natural extension of the former.

3 Arguments for the LF Analysis of Scrambling

In this section we provide conceptual and empirical arguments for the LF analysis of scrambling and show that it offers a principled account for a number of scrambling's otherwise puzzling properties.

First, as already noted, our analysis makes scrambling fully consistent with the Last Resort principle, eliminating an exception to the general principle. In our view, scrambled sentences involve obligatory LF movement of ''scrambled'' phrases to the positions where they receive θ-roles. Failure of the movement to take place would result in ungrammaticality. This is the most prominent feature of the present analysis that differentiates it from the standard view that scrambled sentences involve an overt movement operation that applies optionally without any reason, which poses a very serious problem for the last resort view of Move α.

Second, our analysis readily explains Saito's (1989) otherwise mysterious observation, based on cases like the following, that scrambling can be undone in LF:

(6) a. Nani-o₁ John-ga [Mary-ga *t*₁ katta ka] sitteiru.
   what-ACC John-NOM Mary-NOM bought Q knows
   'John knows what Mary bought.'

Japanese and English implies that strong features can ''belong'' to lexical categories and not just to functional ones, a property that Chomsky (1995) suggests is not possible (though he does not offer empirical reasons for this suggestion). That strong features *can* ''belong'' to lexical categories has, however, been argued on empirical grounds by Bošković (1997a,b, in press a) and Lasnik (1995c). Bošković provides evidence based on participial and multiple *wh*-fronting constructions that Serbo-Croatian verbs and nouns have certain strong features. Lasnik argues on the basis of the pseudo-gapping construction that English verbs contain certain strong features, in fact, θ-features.

b. [Mary-ga   nani-o   katta   to]$_1$ John-ga [Bill-ga t_1 itta ka] sitteiru.
   Mary-NOM what-ACC bought that John-NOM Bill-NOM   said Q   knows
   'John knows what Bill said that Mary bought.'

In (6a) the embedded object *wh*-phrase is scrambled to the matrix clause, but it can still take embedded scope. In fact, it must, since the matrix clause is not specified as interrogative. (Japanese interrogative clauses are marked by the question markers *ka* and *no*.) (6b) involves scrambling of the most embedded CP containing a *wh*-phrase to the matrix clause, and the *wh*-phrase again must take scope in the intermediate CP. In this respect, scrambling differs from both *wh*-movement and topicalization.

(7) ?[Which picture of who$_1$]$_2$ do you wonder who$_3$ t_3 bought t_2?

(8) *[That picture of who$_1$]$_2$, I know who$_3$ t_3 bought t_2.

(7), which is marginal because of the *Wh*-Island Constraint violation, cannot have the interpretation on which *who* takes embedded scope. Also, (8) is ungrammatical, showing that *who* cannot take embedded scope once the phrase containing it topicalizes out of the embedded clause. On the basis of these facts, Saito (1989) concludes that unlike *wh*-movement and topicalization, scrambling has no semantic import; that is, it does not establish an operator-variable relation and hence can be undone in LF, so that the *wh*-phrases are within their scope at LF in (6). The fact that scrambling can be undone is puzzling under the standard assumption that, like *wh*-movement and topicalization, which cannot be undone, scrambling in the constructions under consideration involves overt Ā-movement.

Note now that under our analysis, the ''scrambled'' *wh*-phrase in (6a) and the ''scrambled'' clause containing the *wh*-phrase in (6b) are base-generated in their surface positions, but lower in LF to the positions where they receive θ-roles. Our analysis thus straightforwardly derives the ''undoability'' of scrambling noted by Saito (1989), with a further consequence that ''can be undone'' is strengthened to ''must be undone,'' which is desirable, as shown convincingly by Tada (1990), Saito (1994), and Sohn (1994) (see the discussion directly below).

It is then predicted that the ''scrambled'' QP cannot take scope over the matrix QP subject in (9) (see Saito 1992 and Tada 1993).

(9) Daremo$_1$-ni   dareka-ga   [Mary-ga t_1 atta to]   omotteiru.
    everyone-DAT someone-NOM Mary-NOM   met that thinks
    = for some *x*, *x* a person, *x* thinks that for every *y*, *y* a person, Mary met *y*
    ≠ for every *y*, *y* a person, there is some *x*, *x* a person, such that *x* thinks that Mary met *y*

Here the sentence-initial QP *daremo-ni* 'everyone' necessarily lowers to the embedded VP-complement position in LF and hence is not able to take scope over the matrix subject QP. This is in accord with the facts.

As the third argument for our analysis, we point out that it eliminates (at least half of) the A/Ā distinction needed for scrambling (see section 4 regarding the other half). Mahajan (1990),

Saito (1992), and Tada (1993), among many others, argue that a certain type of scrambling, of which long-distance scrambling is representative, is $\bar{\text{A}}$-movement. This conclusion is based on examples such as the following:

(10) *[Mary to   Pam]$_1$-ni [otagai$_1$-no   hahaoya]-ga [John-ga t_1 atta to]   omotteiru.
        Mary and Pam-DAT each other-GEN mother-NOM   John-NOM   met that think
        'Mary and Pam, each other's mothers think that John met.'

Put in standard terms, the scrambled NP cannot antecede the anaphor in (10), though in its scrambled position it c-commands it. The explanation has been that the scrambled phrase is located in an $\bar{\text{A}}$-position in this case, failing to qualify as an appropriate antecedent for the anaphor.

However, a recent trend in linguistic theory has been the reluctance to stipulate that syntactic positions are divided into several types (see, for example, Abe 1993 and Chomsky 1995). It is desirable, therefore, if we can account for (10) without reference to the A/$\bar{\text{A}}$ distinction. And in fact, we can: under our analysis, the scrambled NP in (10) is obligatorily lowered to the embedded VP in LF, so that it does not c-command the anaphor inside the matrix subject at LF. (A similar analysis is proposed in Tada 1990.) Thus, (10) should be on a par with its nonscrambled counterpart.

(11) *[Otagai$_1$-no hahaoya]-ga [John-ga [Mary to Pam]$_1$-ni atta to] omotteiru.

Turning now to more empirical issues, we observe that our analysis accounts for the impossibility of ''long-distance'' scrambling of adverbials, noted by Miyara (1982) and Saito (1985). Consider the following examples from Saito 1985:

(12) a. Mary-ga   [John-ga riyuu-mo   naku   sono setu-o   sinziteiru to]
            Mary-NOM   John-NOM reason-even without that theory-ACC believes   that
            omotteiru.
            thinks
            'Mary thinks that John believes in that theory without any reason.'
       b. *Riyuu-mo naku$_1$ Mary-ga [John-ga t_1 sono setu-o sinziteiru to] omotteiru.

In standard terms, (12b) is derived from (12a) by scrambling the adjunct modifying the embedded predicate. Under the standard assumption that scrambling is an optional overt movement operation applying without any driving force, the ungrammaticality of (12b) is very puzzling. The question is why, in contrast to arguments, adjuncts cannot undergo long-distance scrambling.[14]

Under our analysis, this otherwise puzzling fact is straightforwardly explained. The adjunct in (12b) is base-generated in the matrix IP-adjoined position and must be lowered in LF to the embedded clause to modify the embedded predicate. Notice, however, that given that adjuncts are licensed by being adjoined to categories, the adjunct is already licensed where it is base-generated. Further, in contrast to the scrambled NP argument in (3b), which has Case and thematic

---

[14] Temporal and locative phrases may at least marginally undergo long-distance scrambling. Murasugi (1991, 1992), however, argues convincingly that those are arguments, rather than adjuncts.

features that are not licensed in its base-generated adjoined position, the adjunct in (12b) possesses neither a Case feature nor a θ-role that could motivate its LF movement. Since there is no reason for *riyuu-mo naku* 'without any reason' to lower into the embedded clause in LF in (12b), the Last Resort principle prevents it from moving.

Significantly, as Mamoru Saito (personal communication) observes, long-distance scrambling of a pure adjunct *wh*-phrase seems to be allowed in the following case, which is better than (12b):

(13) ?Naze Mary-ga   [$_{CP}$ John-ga   sono setu-o   sinziteiru ka] sitteiru.
     why Mary-NOM   John-NOM that theory-ACC believes Q   knows
     'Mary knows why John believes in that theory.'

Unlike the adjunct in (12b), the adjunct *wh*-phrase in (13) can be interpreted in the embedded clause. (In fact, it must be, since only the embedded clause is specified as interrogative.) Notice, however, that in contrast to the adjunct in (12b), the adjunct in (13) has a formal feature that is not checked in its base-generated, matrix IP-adjoined position and thus motivates its LF movement, namely, the [+wh] feature. To check the [+wh] feature, *naze* 'why' moves to the embedded [Spec, CP] in (13), which is permissible in terms of the Last Resort principle; consequently, it can modify the embedded clause. (We assume with Law (1994), Rizzi (1990), and Uriagereka (1988) that an adjunct *wh*-phrase in the specifier of a CP can directly modify the CP (or its IP complement) without binding a trace.)[15] The current analysis thus accounts both for the contrast between arguments and non-*wh*-adjuncts and for the contrast between non-*wh*-adjuncts and *wh*-adjuncts with respect to ''long-distance scrambling.'' Crucial to our account is that ''scrambling'' is subject to Last Resort; that is, there must be a formal reason for the scrambled element to move in LF to the position where it is interpreted.

Furthermore, as far as we are aware, scrambling in the standard sense never applies in LF (see Saito 1994 for arguments that scrambling cannot take place in LF). This is clearly a significant fact to explain. Under the assumption that scrambling occurs optionally without any reason, it must be stipulated that it may not take place in LF. In contrast, our analysis does not face this problem, since in this analysis such an operation does not exist in the first place.

The LF theory of scrambling also naturally accommodates Saito's (1985) observation that extraction out of scrambled phrases is grammatical, as in the following sentences:

(14) a. [$_{CP}$ *OP*$_1$ [$_{IP}$[$_{CP}$ John-ga t_1 katta   to]$_2$ [$_{IP}$ Bill-ga t_2 omotteiru]] yorimo]
                    John-NOM   bought that   Bill-NOM   thinks   than
         Mary-wa ooku-no hon-o   katta.
         Mary-TOP many   book-ACC bought
         'Mary bought more books than Bill thinks that John bought.'

---

[15] Note that *wh*-adjuncts must be located in [Spec, CP] at LF even in the systems where *wh*-arguments in situ are unselectively bound by C instead of moving to [Spec, CP] in LF; see Reinhart 1995 and Tsai 1994.

b. [Sono hon-o_1 [John-ga   [$_{CP}$[$_{IP}$[$_{CP}$ Mary-ga t_1 katta   to]$_2$ [$_{IP}$ Bill-ga t_2
   that book-ACC John-NOM   Mary-NOM   bought that   Bill-NOM
itta]] to] omotteiru]].
said that think
'That book$_2$, John thinks that [that Mary bought t_2]$_1$, Bill said t_1.'

As Kikuchi (1987) convincingly demonstrates, comparative deletion in Japanese involves null operator movement. In (14a), then, the operator must be extracted out of the scrambled CP. (14b) shows that scrambling ''out of'' scrambled phrases is also allowed. ((14a–b) give structures in accordance with the overt movement analysis.)

That scrambled phrases do not constitute islands would be a peculiar property if scrambling were overt movement. On the basis of examples like the following, Takahashi (1994) argues that extraction out of heads of nontrivial chains is disallowed:

(15) a. *How$_1$ is [to fix the car t_1]$_2$ [$_{AP}$ t_2 difficult]?
     b. *How$_1$ do you wonder [[how likely to [fix the car t_1]]$_2$ [he is t_2]]?

Assuming the predicate-internal subject hypothesis, the subject in [Spec, IP] heads a nontrivial chain in (15a). In (15b) the *wh*-phrase AP headed by *likely* also clearly heads a nontrivial (Ā-) chain. In both cases extraction out of the heads of the nontrivial chains results in ungrammaticality. In fact, Takahashi (1994) shows that such extraction is quite generally unacceptable.[16] Given this consideration, the grammaticality of (14) is mysterious under the standard view that scrambling creates nontrivial chains at S-Structure.

Once our analysis is adopted, however, the grammaticality of (14) is readily accounted for. Under our analysis, the IP-adjoined CP inside the *than*-clause in (14a) heads a trivial rather than a nontrivial chain when the null operator moves out of the CP in overt syntax, making (14a) different from (15) in the relevant respect. In (14b), on the other hand, no relevant extraction takes place, since both ''scrambled'' phrases are base-generated where they are at S-Structure.

We have so far limited our attention to the cases where LF movement of phrases base-generated in IP-adjoined positions involves lowering. However, nothing should prevent it from involving raising. With this in mind, we consider the following case:

(16) a. John-ga   Bill-ni   [riyuu-mo   naku   Mary-ga   nakidasita   to] itta.
        John-NOM Bill-DAT reason-even without Mary-NOM began to cry that said
        'John told Bill that Mary began to cry without any reason.'
     b. ?John-ga t_1 [riyuu-mo naku Bill$_1$-ni Mary-ga nakidasita to] itta.

In standard terms, (16b) is derived from (16a) by scrambling or lowering the matrix indirect object *Bill-ni* to the embedded IP-adjoined position below the adjunct belonging to the embedded

---

[16] Takahashi (1994) offers a theoretical explanation of the generalization in terms of Chomsky's (1994) chain uniformity condition. The basic idea is that extraction from one link of a nontrivial chain makes the links of the chain in question different from one another, violating the requirement that chains be uniform. A similar analysis is proposed independently by Ormazabal, Uriagereka, and Uribe-Echevarria (1994).

clause. As noted above, adjuncts cannot scramble, so that (16b) cannot be analyzed as involving scrambling of the embedded adjunct to a position between the matrix subject and indirect object. Significantly, (16b) is not so bad. If (16) were an instance of overt lowering, we would expect it to be completely ungrammatical given that, as argued by Chomsky (1995) and discussed above, all overt lowering is ruled out for PF reasons. However, (16) strongly contrasts with unambiguous instances of overt lowering such as *John told t_1 that $Bill_1$ Mary began to cry and *It was told t_1 $Bill_1$ seems Mary will leave. The analysis pursued here predicts (16b) to be grammatical: there is nothing wrong with the derivation of (16b) in which the NP Bill-ni is base-generated in the embedded IP-adjoined position and then raises in LF to receive a θ-role from the matrix verb. Thus, the data in (16) favor our approach.

However, raising LF scrambling does not always give a good result. Thus, constructions such as (17) are ungrammatical.

(17) *John-ga   e [Peter-ga   [riyuu-mo   naku   Bill-ni   Mary-ga   nakidasita   to]
      John-NOM   Peter-NOM   reason-even without Bill-DAT Mary-NOM began to cry that
      omotta] to   itta (koto).
      thought that said fact
      'John told Bill that Peter thought that Mary began to cry without any reason.'

Clearly, more work needs to be done with respect to raising LF scrambling. We will leave a comprehensive examination of the phenomenon for future research. We do, however, suggest below a principled way of ruling out constructions such as (17) that does not have any undesirable consequences for (16b).

One additional area where the LF and the standard overt movement theories of scrambling may make different predictions is islands. Although under both theories scrambling involves movement, the movements involved are quite different. They differ with respect to when they take place, where they land, and whether they leave traces. Still, it is not easy to tease apart the two theories with respect to some islands. Consider the Adjunct Condition, which subsumes the Complex NP Constraint if apparent clausal complements of nouns are in fact adjuncts (see Stowell 1981 and Grimshaw 1990).[17] Under the current theory, which dispenses with the notion of barrier, it is not at all clear what is responsible for the descriptive generalization that crossing an adjunct boundary leads to degradation. Given this, it is impossible to determine whether the LF and the overt movement theories of scrambling would make different predictions with respect to the Adjunct Condition. (Notice that under both theories, movement crosses an adjunct boundary in constructions in which such a boundary separates the S-Structure position and the θ-position of a ''scrambled'' phrase.) It is worth noting here that the facts concerning scrambling into/out of adjuncts in Japanese are not much clearer than the underlying theory; that is, it is not clear that there are any Adjunct Condition effects with scrambling. The only clear fact is that constructions involving scrambling into/out of adjuncts are much better than constructions involving other

---

[17] We ignore here the Coordinate Structure Constraint, the Left Branch Condition, and the Specificity Condition, since it is not at all clear that these are movement constraints. Note also that Japanese does not obey the Subject Condition (see Saito 1985).

movement operations out of adjuncts (e.g., *wh*-movement and topicalization in English), a fact that may be significant.

Let us therefore turn to better-understood islands, where the relevant Japanese data are also clearer, namely, Relativized Minimality (RM) islands. Under standard assumptions, (18) and (19) are ruled out because they involve Ā-movement crossing an element in an Ā-position (*whether* in (18) and *that book* in (19)). Significantly, as (20)–(21) show, scrambling differs from topicalization in the relevant respect. This raises a serious problem for the overt movement theory of scrambling, which treats scrambling in (20)–(21) as overt Ā-movement.

(18) ?*John$_1$, you wonder whether Mary kissed t_1.

(19) ?*To John$_2$, that book$_1$, (Bill said that) Mary handed t_1 t_2.

(20) Sono hon-o$_1$ John-ga [Mary-ga t_1 yonda ka dooka] siritagatteiru.
that book-ACC John-NOM Mary-NOM read whether wants to know
'That book, John wants to know whether Mary read.'

(21) Sono hon-o$_1$ John-ni$_2$ [Bill-ga [Mary-ga t_2 t_1 watasita to] itta].
that book-ACC John-to Bill-NOM Mary-NOM handed that said
'That book, to John, Bill said that Mary handed.'

Particularly instructive in this respect is Russian, a scrambling language that uncontroversially has overt *wh*-movement. Significantly, as noted by Müller and Sternefeld (1993), *wh*-movement and scrambling in Russian differ with respect to *wh*-islands, a fact that can be readily accounted for under base-generation analyses but raises a serious problem for any overt movement analysis of scrambling. (For more data illustrating the same point, see Müller and Sternefeld 1993 and Stjepanović 1997.)[18]

(22) a. *Kto$_1$ ty videl kogda t_1 pod' 'ezžal?
who you saw when came
'Who did you see when came?'
b. Ty doktor$_1$ videl kogda t_1 pod' 'ezžal?
you doctor saw when came
'Did you see when the doctor came?'

Given that the landing site of LF scrambling is a θ-position, the question arises why elements in A-positions intervening between the S-Structure position of scrambled elements and their LF targets do not induce RM effects. Rizzi's (1990) definition of the notion of intervention relevant to RM provides an answer to this question if applied literally. According to Rizzi, W can induce an RM effect for movement from X to Y only if W c-commands X and does not c-command Y,

---

[18] Under our analysis, we need to rule out the derivation that generates *kto* in [Spec, CP] and lowers it to its θ-position in LF. It has often been observed that once a phrase is located in an operator position at S-Structure, it cannot undergo further LF movement (see, e.g., Epstein 1992, Lasnik and Uriagereka 1988, Lasnik and Saito 1992). If this is indeed the case, *kto* would not be allowed to undergo LF movement from [Spec, CP] and the derivation in question would be ruled out, as desired. It is worth noting here that Bošković (1997a) shows that the ban on movement from operator positions is needed even in the minimalist framework, though what it could follow from remains to be determined.

which essentially exempts lowering from the RM effect. Recall, however, that LF scrambling movement can be either lowering or raising. The above definition exempts lowering LF scrambling from the RM effect, but not raising LF scrambling. This in turn rules out long-distance raising LF scrambling, like LF movement of *Bill-ni* to *e* in (17), since the LF movement of the scrambled phrase to its θ-position in such constructions invariably violates RM, because a phrase intervenes in A-position.

4 A-Scrambling

We turn now to so-called clause-internal scrambling.

Mahajan (1990) argues that unlike long-distance scrambling, clause-internal scrambling can be ''A-movement'' in Hindi. On the basis of constructions such as (23), where the scrambled NP antecedes an anaphor (cf. (10)), Saito (1992) and Tada (1993) argue that this also holds in Japanese. Notice also that the scrambled QP can take scope over the subject QP in (24), which contrasts with (9) in this respect.

(23) [Mary to   Pam]$_1$-ni [otagai$_1$-no   hahaoya]-ga t_1 atta.
       Mary and Pam-DAT each other-GEN mother-NOM   met
       'Mary and Pam, each other's mothers met.'

(24) Daremo$_1$-ni   dareka-ga t_1 atta.
       everyone-DAT someone-NOM   met
       'Everyone, someone met.'

Pursuing the analysis in section 2, we have to assume that, in contrast to ''long-distance scrambling,'' ''clause-internal scrambling'' allows the ''scrambled'' phrase to remain in its surface position at LF. We follow Saito (1992) and Tada (1993) in assuming that V-to-I movement is the key factor that permits a ''clause-internally-scrambled'' phrase to remain in the IP-adjoined position at LF. Specifically, we hypothesize that when moved to I, a verb may θ-mark its object in the IP-adjoined position, allowing it to stay there at LF.[19] After V incorporates into I, the projection of I is analyzed as that of V (see Epstein 1993 for a similar idea). The θ-marking of the direct object is then done in a licit way within the projection of the θ-marker.

The sort of derivation proposed in section 2 must be another option for ''clause-internally-scrambled'' phrases, as they also exhibit some properties of ''long-distance-scrambled'' phrases. For example, the QP object may take narrower scope than the QP subject in (24), and the anaphoric object can take the subject as its antecedent in (25).

(25) Zibunzisin-o John-ga   semeta.
       himself-ACC John-NOM blamed
       'John blamed himself.'

---

[19] We are not concerned with the question of when V-to-I movement takes place in Japanese. It suffices for our purposes that V is in I at LF. We are following Chomsky (1993, 1995) in assuming that V universally ends up in I by LF, languages differing only with respect to when V-to-I movement takes place. For discussion concerning when it takes place in Japanese, see Koizumi 1995, Otani and Whitman 1991, Saito 1992, and Takahashi 1993, among others.

If the anaphor moves to the VP-complement position in LF in (25), it is c-commanded by the subject and does not c-command it, as desired.[20]

Consider now the Condition C–type reconstruction effect observed by Saito (1985, 1992) and illustrated by (26), which patterns with (27) in the relevant respect.

(26) *[$_{IP}$[John$_1$-no hahaoya]-o [$_{IP}$ kare$_1$-ga semeta]].
        John-GEN mother-ACC   he-NOM blamed
     'John's mother, he blamed.'

(27) *[$_{IP}$[John$_1$-no heya]-ga   [$_{IP}$ kare$_1$-ga ansindekiru]].
        John-GEN room-NOM   he-NOM can feel relieved
     'It is John's room in which he can feel relieved.'

If the object may stay in the IP-adjoined position at LF, how can (26) be a Condition C violation? The answer is provided by the segment theory of adjunction. (Here we essentially follow Reinhart (1976, 1981).) The lower IP in (26) is just a segment of the two-segment category IP, so that the subject in [Spec, IP] c-commands the object in the IP-adjoined position, with the ''branching node'' in the formulation of c-command understood as a category, not as a segment. This account is supported by the multiple-subject construction in (27), which has the same status as (26). Since the first subject in (27) must be base-generated in the IP-adjoined position and stay there at LF, our analysis seems necessary.

---

[20] The question arises why the anaphor in (25) is allowed to undergo LF lowering if it can be θ-marked in the IP-adjoined position. The answer may lie in Kuroda's (1988) theory of specifier-head agreement in Japanese, as modified by Saito (1992). Following Saito (1992), we assume that since agreement can be a many-to-one relation in Japanese, the IP-adjoined position can optionally be reanalyzed as an additional [Spec, IP] at LF. (Being a process, the reanalysis is expected to be in principle optional.) If the reanalysis takes place, the IP-adjoined argument is θ-marked without movement. On the other hand, if the reanalysis does not take place, the IP-adjoined argument necessarily moves in LF to the VP-complement position. This amounts to assuming that θ-marking must be done under purely X-bar-theoretic configurations, either the head-complement or the specifier-head configuration. Given the discussion in footnote 9, it may, however, be desirable to reduce all θ-marking to the specifier-head configuration, a move that would be fully in line with the formal features view of θ-roles. Under this view, all that is needed is that the verb be in a checking relation with the direct object NP in order for θ-marking to take place. Note in this respect that Saito (1992) himself claims that the verb located under I and the direct object NP in a reanalyzed additional [Spec, IP] are in a checking relation. According to Saito, they are both in a Case-licensing and a θ-licensing relation.

Given the discussion in this footnote, if the possibility of multiple subjects is taken to be an indication of the availability of multiple specifiers of I in a language, we would expect that in scrambling languages that do not allow the multiple-subject construction, even ''short-distance-scrambled'' NPs preceding a subject will have to undergo LF lowering. The expectation appears to be borne out. Thus, in contrast to what we find in Japanese, in German and Slavic scrambling languages, which do not allow the multiple-subject construction, ''short-distance-scrambled'' direct object NPs cannot bind an anaphor within a subject. ((i) is from Serbo-Croatian. (ii) is taken from Grewendorf and Sabel 1996.)

(i) Marka i   Petra$_1$ [protivnici   (*jedan drugoga$_1$)] poštuju.
    Marko and Peter(ACC) opponents(NOM)   each other(GEN) respect
    'Marko and Peter, opponents of each other respect.'
(ii) weil den Studenten$_1$ [die Lehrer   (*von sich$_1$)] zweifellos   in guter Erinnerung behalten haben
     since the student(ACC) the teachers(NOM) of   himself undoubtedly in good memory   kept   have
     'since the student, the teachers of himself have undoubtedly kept a good memory of'

(It is worth noting here that a direct object NP preceding a subject can bind an anaphor within the subject in Hindi, a scrambling language that does not allow the multiple-subject construction. However, Mahajan (1990) argues that the

Under our analysis, ''short-distance scrambling'' in front of a subject is not always undone in Japanese: ''short-distance-scrambled'' NPs preceding a subject sometimes remain in their S-Structure position and sometimes undergo LF lowering. The latter option is excluded when the NPs in question bind into the subject. Given this, our analysis makes an interesting prediction with respect to ''numeral float.'' Let us assume, following Miyagawa (1989), that a direct object NP or its trace and a numeral associated with it must both be dominated by the same VP at some level of representation (LF in the minimalist framework), the relevant locality condition on the association being mutual c-command.[21] Given this, under our analysis we would expect ''numeral float'' to be possible in the cases in which ''short-distance-scrambled'' NPs preceding a subject can undergo LF lowering within VP, which should license the association with the numeral, located within VP, but not when they remain in their S-Structure position. This means that ''numeral float'' should be blocked when a scrambled NP preceding the subject A-binds into the subject, but should be allowed when this does not happen. The prediction is borne out, as shown in (28).

(28) a. Gakusei-o   John-ga   futari sikatta.
         students-ACC John-NOM two   scolded
         'Students, John scolded two.'
     b. *Gakusei-o   otagai-no   sensei-ga   futari sikatta.
         students-ACC each other-GEN teachers-NOM two   scolded
         'Students, each other's teachers scolded two.'
     c. Gakusei-o otagai-no sensei-ga sikatta.
         'Students, each other's teachers scolded.'

Since under our analysis scrambling does not involve movement from the θ-position of the scrambled element, to license the association between the numeral and the scrambled NPs in (28) the numeral and the NPs themselves (rather than their traces) must be dominated by the same VP in LF. As discussed at length above, under our analysis the direct object NP is base-generated in its S-Structure position in both (28a) and (28b). However, in contrast to the direct object NP in (28a), the direct object NP in (28b) must remain in its base-generated position at LF; otherwise, Condition A will be violated, just as it is violated in *Otagai-no sensei-ga gakusei-o futari sikatta* 'Each other's teachers scolded two students'. Since, in contrast to *gakusei-o* in (28a), under our analysis *gakusei-o* in (28b) cannot be located within VP at any point of the derivation, we have a straightforward account of the contrast between (28a) and (28b) with respect to the possibility of ''numeral float.'' On the other hand, the contrast raises a difficulty for the standard overt movement analysis of scrambling since under this analysis the numeral and the trace of the scrambled NP are dominated by the same VP in both (28a) and (28b), which should license the association of the scrambled NP with the numeral under Miyagawa's analysis.

---

direct object in such constructions is not undergoing adjunction scrambling. Rather, it is located in [Spec, Agr$_O$P] overtly (i.e., it undergoes overt object shift), the subject being located in a lower position, which suffices to enable the direct object NP to bind an anaphor within the subject.)

[21] We restrict our attention here to constructions in which the numeral is located within VP.

(29) a.   Gakusei-o$_1$ John-ga [$_{VP}$ t_1 futari sikatta].
     b. *Gakusei-o$_1$ otagai-no sensei-ga [$_{VP}$ t_1 futari sikatta].

5 Summary

In this article we have proposed a novel analysis of scrambling in which a number of its properties that have been problematic for previous analyses and the minimalist framework in general receive a principled explanation.

We have argued that scrambled sentences involve obligatory LF movement of arguments base-generated in non-θ-positions to the positions where they receive θ-roles. This analysis makes scrambling consistent with the Last Resort principle. In addition, it explains why scrambling must be ''undone'' in LF, thereby deriving its Ā-properties without reference to the A/Ā distinction.[22]

Turning to more empirical consequences of our analysis, we have shown that it straightforwardly explains the otherwise puzzling facts that, in contrast to arguments and *wh*-adjuncts, non-*wh*-adjuncts cannot undergo traditional long-distance scrambling, and that traditional scrambling operations cannot apply in LF. The facts that scrambled phrases may appear overtly in positions that are lower than the positions where they are θ-marked, and that extraction out of scrambled phrases is allowed—curious properties if scrambling were overt movement—are also readily accommodated. We believe that the explanatory power of our analysis, which explains a number of otherwise puzzling properties of scrambling simply by making use of mechanisms made available by the theory, favors it over alternative analyses.

Although our analysis follows the tradition of base-generation approaches to scrambling in that it does not posit any overt scrambling movement and considers free word order a result of free generation of phrases in an arbitrary order, in a way it bridges the gap between base-generation and movement analyses, since it shares several properties with the movement analysis.[23] Like the movement analysis, and unlike most base-generation analyses, our analysis treats scrambling languages as fully configurational. Although on our analysis scrambling constructions such as (3b) do not involve overt movement, they do involve a movement operation applying on the mapping from S-Structure to LF, as a result of which (3a) and (3b) have the same structure at one level of representation (LF). The existence of one basic word order underlying constructions such as (3a) and (3b) is denied by other base-generation analyses but is the cornerstone of the movement analysis. Our analysis simply replaces the optional overt movement of the traditional movement analysis with obligatory LF movement, in accordance with the Last Resort principle. As we showed, this enables us to solve a number of empirical and conceptual problems raised by scrambling in Japanese. Determining whether our analysis can be carried over to other scrambling languages, which should answer the question of whether scrambling should be treated as a unitary phenomenon crosslinguistically, is left for future research.

---

[22] In Bošković and Takahashi 1996 we show that our analysis also enables us to eliminate the S-Structure Proper Binding Condition, posited to account for certain properties of scrambling (see Saito 1989, 1992).

[23] Ross (1967) proposes another approach to scrambling. He considers the freedom of word order in scrambling languages to be a consequence of the existence of a low-level stylistic rule, which in the current framework could be taken to apply in PF. This analysis has been conclusively shown to be untenable on empirical grounds (see Saito 1985).

References

Abe, Jun. 1993. Binding conditions and scrambling without A/A′-distinction. Doctoral dissertation, University of Connecticut, Storrs.

Baker, Mark. 1989. Object sharing and projection in serial verb constructions. *Linguistic Inquiry* 20:513–553.

Bošković, Željko. 1994. D-Structure, θ-Criterion, and movement into θ-positions. *Linguistic Analysis* 24: 247–286.

Bošković, Željko. 1997a. Fronting of *wh*-phrases in Serbo-Croatian. In *Formal Approaches to Slavic Linguistics: The Indiana Meeting, 1996,* ed. Steven Franks and Martina Lindseth, 119–143. Ann Arbor: Michigan Slavic Publications.

Bošković, Željko. 1997b. *The syntax of nonfinite complementation: An economy approach*. Cambridge, Mass.: MIT Press.

Bošković, Željko. In press a. Multiple *wh*-fronting and economy of derivation. In *Proceedings of the Sixteenth West Coast Conference on Formal Linguistics.* Stanford, Calif.: CSLI Publications.

Bošković, Željko. In press b. Sometimes in SpecCP, sometimes in-situ. In *Step by step: Essays on minimalism in honor of Howard Lasnik,* ed. Roger Martin, David Michaels, and Juan Uriagereka. Cambridge, Mass.: MIT Press.

Bošković, Željko, and Daiko Takahashi. 1996. Scrambling and the Proper Binding Condition. Ms., University of Connecticut, Storrs, and Tohoku University.

Burzio, Luigi. 1986. *Italian syntax: A government and binding approach.* Dordrecht: Reidel.

Chomsky, Noam. 1976. Conditions on rules of grammar. *Linguistic Analysis* 2:303–351.

Chomsky, Noam. 1981. *Lectures on government and binding.* Dordrecht: Foris.

Chomsky, Noam. 1986a. *Barriers.* Cambridge, Mass.: MIT Press.

Chomsky, Noam. 1986b. *Knowledge of language: Its nature, origin, and use.* New York: Praeger.

Chomsky, Noam. 1993. A minimalist program for linguistic theory. In *The view from Building 20: Essays in linguistics in honor of Sylvain Bromberger,* ed. Kenneth Hale and Samuel Jay Keyser, 1–52. Cambridge, Mass.: MIT Press.

Chomsky, Noam. 1994. Bare phrase structure. MIT Occasional Papers in Linguistics 5. MITWPL, Department of Linguistics and Philosophy, MIT, Cambridge, Mass. [Published in *Government and Binding Theory and the Minimalist Program,* ed. Gert Webelhuth, 383–439. Oxford: Blackwell (1995).]

Chomsky, Noam. 1995. Categories and transformations. In *The Minimalist Program,* 219–394. Cambridge, Mass.: MIT Press.

Collins, Chris. 1995. Toward a theory of optimal derivations. In *MIT working papers in linguistics 27: Papers on minimalist syntax,* 65–103. MITWPL, Department of Linguistics and Philosophy, MIT, Cambridge, Mass.

Epstein, Samuel David. 1992. Derivational constraints on Ā-chain formation. *Linguistic Inquiry* 23:235–260.

Epstein, Samuel David. 1993. On superiority. Ms., Harvard University, Cambridge, Mass.

Epstein, Samuel David. In press. Un-principled syntax and the derivation of syntactic relations. In *Working minimalism*, ed. M. A. Browning. Cambridge, Mass.: MIT Press.

Fiengo, Robert. 1974. Semantic conditions on surface structure. Doctoral dissertation, MIT, Cambridge, Mass.

Fiengo, Robert. 1977. On trace theory. *Linguistic Inquiry* 8:35–61.

Fukui, Naoki. 1986. A theory of category projection and its implications. Doctoral dissertation, MIT, Cambridge, Mass.

Fukui, Naoki. 1993. Parameters and optionality. *Linguistic Inquiry* 24:399–420.

Fukui, Naoki, and Mamoru Saito. 1992. Spec-head agreement, X′-compatibility, and optionality. Paper presented at MIT Colloquium, MIT, Cambridge, Mass.

Grewendorf, Günther, and Joachim Sabel. 1996. Multiple specifiers and the theory of adjunction: On scram-

bling in German and Japanese. Sprachwissenschaft in Frankfurt 16. Institut für Deutsche Sprache und Literatur II, Universität Frankfurt.

Grimshaw, Jane. 1990. *Argument structure.* Cambridge, Mass.: MIT Press.

Hale, Kenneth. 1983. Warlpiri and the grammar of non-configurational languages. *Natural Language & Linguistic Theory* 1:5–47.

Harada, Shinichi. 1977. Nihongo-ni 'henkei'-wa hituyoo-doo. (Transformations are necessary in Japanese.) *Gengo* 6:11–12.

Jang, Youngjun. 1995. Merger, object position, and directionality. Paper presented at the 18th GLOW Colloquium, Tromsø.

Kayne, Richard. 1994. *The antisymmetry of syntax.* Cambridge, Mass.: MIT Press.

Kikuchi, Akira. 1987. Comparative deletion in Japanese. Ms., Yamagata University.

Kim, Jeong-Seok. 1997. Focus movement and ellipsis in Korean and Japanese. In *Proceedings of the Fifth Meeting of the Conference of the Student Organization of Linguistics in Europe,* 169–182. Leiden: SOLE.

Kitagawa, Yoshihisa. 1990. Anti-scrambling. Ms., University of Rochester, Rochester, N.Y.

Koizumi, Masatoshi. 1995. Phrase structure in minimalist syntax. Doctoral dissertation, MIT, Cambridge, Mass.

Kuroda, S.-Y. 1988. Whether we agree or not. In *Papers from the Second International Workshop on Japanese Syntax,* 103–143. Stanford, Calif.: CSLI Publications. [Distributed by Cambridge University Press.]

Lasnik, Howard. 1995a. Case and expletives revisited: On Greed and other human failings. *Linguistic Inquiry* 26:615–633.

Lasnik, Howard. 1995b. Last resort. In *Minimalism and linguistic theory,* ed. Shosuke Haraguchi and Michio Funaki, 1–32. Tokyo: Hituzi Syobo.

Lasnik, Howard. 1995c. A note on pseudogapping. In *MIT working papers in linguistics 27: Papers on minimalist syntax,* 143–163. MITWPL, Department of Linguistics and Philosophy, MIT, Cambridge, Mass.

Lasnik, Howard. 1996. Quantifier lowering? Ms., University of Connecticut, Storrs.

Lasnik, Howard, and Mamoru Saito. 1984. On the nature of proper government. *Linguistic Inquiry* 15:235–289.

Lasnik, Howard, and Mamoru Saito. 1992. *Move α: Conditions on its application and output.* Cambridge, Mass.: MIT Press.

Lasnik, Howard, and Juan Uriagereka. 1988. *A course in GB syntax.* Cambridge, Mass.: MIT Press.

Law, Paul. 1994. On the base position of *wh*-adjuncts and extraction. Talk given at the 67th annual meeting of the Linguistic Society of America, Los Angeles.

Mahajan, Anoop. 1990. A/A′-distinction and the movement theory. Doctoral dissertation, MIT, Cambridge, Mass.

May, Robert. 1977. The grammar of quantification. Doctoral dissertation, MIT, Cambridge, Mass.

May, Robert. 1985. *Logical Form.* Cambridge, Mass.: MIT Press.

Miyagawa, Shigeru. 1989. *Structure and Case marking in Japanese: Syntax and semantics 22*. San Diego, Calif.: Academic Press.

Miyara, Shinsyo. 1982. Reordering in Japanese. *Linguistic Analysis* 9:307–340.

Müller, Gereon, and Wolfgang Sternefeld. 1993. Improper movement and unambiguous binding. *Linguistic Inquiry* 24:461–508.

Murasugi, Keiko. 1991. Noun phrases in Japanese and English: A study in syntax, learnability and acquisition. Doctoral dissertation, University of Connecticut, Storrs.

Murasugi, Keiko. 1992. Locative/temporal vs. manner/reason phrases. In *Papers in English linguistics and literature*, 153–170. Department of English Literature, Kinjo Gakuin University.

Ormazabal, Javier, Juan Uriagereka, and Miriam Uribe-Echevarria. 1994. Word order and *wh*-movement: Towards a parametric account. Paper presented at the 17th GLOW Colloquium, Vienna.

Otani, Kazuyo, and John Whitman. 1991. V-raising and VP-ellipsis. *Linguistic Inquiry* 22:345–358.

Reinhart, Tanya. 1976. The syntactic domain of anaphora. Doctoral dissertation, MIT, Cambridge, Mass.

Reinhart, Tanya. 1981. Definite NP anaphora and c-command domains. *Linguistic Inquiry* 12:605–635.

Reinhart, Tanya. 1995. Interface strategies. OTS Working Papers. Research Institute for Language and Speech, Utrecht University.

Rizzi, Luigi. 1990. *Relativized Minimality.* Cambridge, Mass.: MIT Press.

Ross, John Robert. 1967. Constraints on variables in syntax. Doctoral dissertation, MIT, Cambridge, Mass.

Saito, Mamoru. 1985. Some asymmetries in Japanese and their theoretical implications. Doctoral dissertation, MIT, Cambridge, Mass.

Saito, Mamoru. 1989. Scrambling as semantically vacuous A′-movement. In *Alternative conceptions of phrase structure,* ed. Mark R. Baltin and Anthony S. Kroch, 182–200. Chicago: University of Chicago Press.

Saito, Mamoru. 1992. Long-distance scrambling in Japanese. *Journal of East Asian Linguistics* 1:69–118.

Saito, Mamoru. 1994. Improper adjunction. In *MIT working papers in linguistics 24: Formal Approaches to Japanese Linguistics 1,* 263–294. MITWPL, Department of Linguistics and Philosophy, MIT, Cambridge, Mass.

Sohn, Keun-Won. 1994. Adjunction to argument, free ride, and a minimalist program. In *MIT working papers in linguistics 24: Formal Approaches to Japanese Linguistics 1,* 315–334. MITWPL, Department of Linguistics and Philosophy, MIT, Cambridge, Mass.

Stjepanović, Sandra. 1997. On scrambling in Serbo-Croatian. Ms., University of Connecticut, Storrs.

Stowell, Tim. 1981. Origins of phrase structure. Doctoral dissertation, MIT, Cambridge, Mass.

Tada, Hiroaki. 1990. Scrambling(s). Talk given at the Ohio State Workshop on Japanese Syntax, Columbus.

Tada, Hiroaki. 1993. A/A′-partition in derivation. Doctoral dissertation, MIT, Cambridge, Mass.

Takahashi, Daiko. 1993. On antecedent-contained deletion. Ms., University of Connecticut, Storrs.

Takahashi, Daiko. 1994. Minimality of movement. Doctoral dissertation, University of Connecticut, Storrs.

Tsai, Wei-Tien Dylan. 1994. On economizing the theory of A′-dependencies. Doctoral dissertation, MIT, Cambridge, Mass.

Uriagereka, Juan. 1988. On government. Doctoral dissertation, University of Connecticut, Storrs.

(Bošković)
Department of Linguistics
University of Connecticut
Storrs, Connecticut 06269

boskovic@uconnvm.uconn.edu

(Takahashi)
Faculty of Languages and Cultures
Tohoku University
Kawauchi, Aoba-ku
Sendai, 980-77 Japan

daiko@sal.tohoku.ac.jp