Proceedings of the thirty-seventh
Western Conference
On Linguistics

Volume eighteen

WECOL 2007

Edited by
Rebecca Colavin
Kathryn Cooke
Kathryn Davidson
Shin Fukuda
Alex Del Guidice

Department of Linguistics
University of California, San Diego
La Jolla, California 92093-0108
Discontinuous Antecedents and Radical Reconstruction

Toru Ishii
Meiji University

1 Introduction

It is a traditional assumption in generative grammar that sound and meaning are indirectly connected through the syntactic component. In the minimalist program (MP) proposed by Chomsky (1995) and further developed by, among others, Chomsky (2004; 2005; 2006), the syntactic component contains operations that transfer the syntactic object (SO) already constructed in the syntactic component to the interfaces, called Transfer operations, which apply at the phase level. PF-Transfer operations hand the SO to the phonological component, which maps to the sensory-motor (S-M) interface; LF-Transfer operations hand the SO to the semantic component, which maps to the conceptual-intentional (C-I) interface. There remains an unsettled question as to at what stage of a derivation PF-Transfer and LF-Transfer should apply. Chomsky (2004; 2005; 2006) claims that phases are the same for PF-Transfer and LF-Transfer and thus both of the Transfer operations apply simultaneously, more specifically when structure-building completes a phase, which is CP and vP in his system. Since PF-Transfer and LF-Transfer are independent operations, however, there is no a priori reason to assume that they should apply simultaneously in a derivation. In fact, it has been suggested by, among others, Megerdoomian (2002), Cecchetto (2004), and Marušič (2005) that phases should not be the same for PF-Transfer and LF-Transfer, and that these two Transfer operations should apply at different stages of a derivation.

This paper argues that phases are the same for both PF-Transfer and LF-Transfer, that is, CP and vP, as argued by Chomsky (2004; 2005; 2006), but there are cases where these two Transfer operations do not apply simultaneously. More specifically, I propose that PF-Transfer and LF-Transfer may apply separately within a phase once the phase becomes "saturated" in the sense of Collins (2002). According to Collins (2002:46), an item is “saturated” if it does not contain any probe-selector property that needs to be satisfied; an item that contains at least one probe or selector is "unsaturated," where the selector property includes a 0-property and a categorial selection property. This analysis leads to an argument/adjunct asymmetry with respect to timing of merger within
a phase. Merger of an argument is triggered by a selector; it must be merged before PF-Transfer and LF-Transfer within a phase. Merger of an adjunct, on the other hand, is not triggered by any probe or selector. Hence, an adjunct may be merged before or after PF/LF-Transfer if we essentially assume with, among others, Lebeaux (1988), Ishii (1997; 1998), and Stepanov (2001), that an adjunct may be merged postcyclically within each phase. This allows merger of an adjunct (not merger of an argument) to be interweaved with PF-Transfer and LF-Transfer within a phase.\(^3\) As an illustration, let us consider (1):

(1) John deliberately broke the rules.

During its derivation, we construct the vP phase. According to our analysis, the arguments John and the rules, whose merger is triggered by their selector, must be merged cyclically. On the other hand, the adjunct deliberately, whose merger is not triggered by any probe or selector, may be merged either cyclically or postcyclically. Suppose that the adjunct deliberately is merged postcyclically. Then, the derivation of the vP phase of (1) proceeds as shown in (2). It should be noted that this paper assumes that complements are sisters to the head X whereas adjuncts are adjoined to XP:

(2) a. \([vP \, John \, [v \, [vP \, break \, the \, rules]]]\]

b. \([vP \, John \, [v \, [vP \textbf{deliberately} \, [vP \, break \, the \, rules]]]]\]

As shown in (2a), the arguments John and the rules are merged cyclically; the VP-adjunct deliberately is merged (more specifically, adjoined to VP) postcyclically, as shown in (2b). It should be noted that the vP phase has already become "saturated" at stage (2a). Hence, PF/LF-Transfer may apply either at stage (2a), \textit{i.e.}, before postcyclic merger of deliberately, or stage (2b), \textit{i.e.}, after postcyclic merger of deliberately. In the former case, merger of the adjunct deliberately is interweaved with PF/LF-Transfer within a phase. In this case, the interweave of Merge and Transfer does not have any effect. I will argue, however, that there are cases where the interweave of Merge and Transfer does have an effect. It is shown that our interweave analysis can account for hitherto unexplained puzzling PF-LF mismatch phenomena. This paper discusses two PF-LF mismatch phenomena, \textit{i.e.}, do so and one anaphora and radical reconstruction with Japanese scrambling. I will argue that these two phenomena, which have been assumed to be totally unrelated to each other, can be given a unified account in a principled way.

The organization of this paper is as follows. Section 2 investigates anaphoric expressions do so and one. It is first shown that contrary to the widely accepted view, the antecedents of do so and one are not necessarily continuous parts of sentences, which is one instance of PF-LF mismatch phenomena. I will then
explicate Culicover and Jackendoff’s (2005) analysis of do so and one anaphora, and show that their analysis cannot account for argument/non-argument asymmetries regarding the antecedents of do so and one. I will argue that the interweave of Merge and Transfer within a phase gives us a principled account of do so and one anaphor facts. Section 3 is concerned with radical reconstruction phenomena with Japanese scrambling, which is another instance of PF-LF mismatch phenomena. It is shown that given that Japanese scrambling is an optional movement, as argued by, among others, Fukui (1993) and Saito and Fukui (1998), the interweave of Merge and Transfer within a phase can account for radical reconstruction phenomena.

2 Do So and One Anaphora

2.1 Culicover and Jackendoff’s (2005) Analysis

There are a number of traditional diagnostics of constituent structure, one of which relates to phenomena of substitution. The basic assumption behind substitution tests is that a particular string of words must be a constituent if it can be substituted (replaced) by something else. This paper is concerned with the anaphoric expressions do so and one, which have been used as diagnostics of constituent structure. More specifically, it has been widely assumed that do so substitutes a VP constituent, functioning as a VP anaphor. Following Fromkin et. al. (2000) and Hornstein, Nunes, and Grohmann (2005), this paper assumes for expository purposes that what one replaces is an NP constituent, and thus one is an NP anaphor. Let us explicate a traditional analysis of do so and one, taking (3, 4) as examples:

(3) a. John bought bread in the supermarket, and Bill did so in the corner shop.  [do so = buy bread]
   b. John bought bread in the supermarket, and Bill did so too.  
      [do so = buy bread in the supermarket]

(4) John likes the Italian student of English, but not the Spanish one.
    [one = student of English]

The structures of buy bread in the supermarket and the Italian student of English are as follows:

(5) [VP [VP buy bread] [in the supermarket]]
(6) [DP the [NP Italian [NP student of English]]]
In (5), the complement bread is the sister to the verb buy; the adjunct in the supermarket is adjoined to VP. The VP anaphor do so can replace either buy bread or buy bread in the supermarket, both of which are VPs. In (6), the complement of English is the sister to the noun student; the adjunct Italian is adjoined to NP. In (4), the NP anaphor one replaces the NP student of English.

It has been pointed out by Radford (1981) and Culicover and Jackendoft (2005) (C&J), however, that the antecedents of do so and one are not necessarily continuous parts of sentences, as shown below:

(7)  
   a. Robin slept for twelve hours in the bunkbed, and Leslie did so for eight hours.  [do so = sleep ... in the bunkbed]
   b. Robin cooked Peking duck on Thursday in order to impress Ozzie, and Leslie did so on Friday.  
      [do so = cook Peking duck ... in order to impress Ozzie]
      (Culicover and Jackendoff 2005: 285)

(8)  
   a. I put that silly picture of Robin from Mary that was on the table next to this artful one from Susan.  
      [one = picture of Robin ... that was on the table]
   b. I put that silly picture of Robin from Mary that was on the table next to this one from Susan.  
      [one = silly picture of Robin ... that was on the table]  
      (Culicover and Jackendoff 2005: 137)
   c. Jane has a big black dog, and Jean has a brown one.  
      [one = big ... dog]  
      (Radford 1981: 117)

In (7a, b), the antecedents of do so are sleep in the bunkbed and cook Peking duck in order to impress Ozzie, respectively. However, they are not continuous parts of the sentences. Similarly, in (8a-c), the antecedents of one are picture of Robin that was on the table, silly picture of Robin that was on the table, and big dog, respectively; they are not continuous parts of the sentences, either.

Based on these facts, C&J claim that the do so and one substitution operations do not count as constituency tests or provide any evidence for the internal structures of VP and DP. They claim that syntactic structures are "flat" in the sense that there is no hierarchical distinction within VP and DP (more generally, XP). Under their analysis, the antecedents of do so and one are not determined by structural conditions, but rather by what they call indirect licensing (IL). The indirectly licensed constituent is taken as anaphoric to the antecedent in that its interpretation is constructed on the basis of that of the antecedent. Their formulations of do so anaphora and one-anaphora are given below (Culicover and Jackendoff 2005: 289, 292):
(9) Do so anaphora
Syntax: [VP [v do][Ψ so] < YP[ORPH3]>]IL
CS: [Action $F(...); ... < Yj> ...]

(10) One-anaphora
CS: [$F(...); ... < Xi> < Yj> < Zk> ...]

Putting the details aside, what (9) says is that in Syntax, a VP consisting of do so and an optional orphan YP (abbreviated as YP with superscript ORPH) is connected to an antecedent by IL. IL also connects the orphan YP to a target within the antecedent. After we establish the antecedent, the function $F$ in the Conceptual Structure (CS) is constructed by reference to the antecedent. Let us consider (3a) (repeated here as (11)) as an example:

(11) John bought bread in the supermarket, and Bill did so in the corner shop.

According to (9), IL connects the VP do so in the corner shop to its antecedent buy bread in the supermarket, and the orphan in the corner shop to its target in the supermarket within the antecedent. The content of the function $F$ can be copied from the CS of the antecedent, except that the target in the supermarket in the antecedent is substituted by the orphan in the corner shop. This provides the correct interpretation, i.e., buy bread in the corner shop, for the VP do so in the corner shop. Similarly, what (10) says is that a DP consisting of one and optional orphans Det/NP, YP, and ZP are connected to an antecedent by IL. Let us consider (4) (repeated here as (12)) as an example:

(12) John likes the Italian student of English, but not the Spanish one.

According to (10), IL connects the DP the Spanish one to its antecedent the Italian student of English, and the orphans the and Spanish to their targets the and Italian. The function $F$ can be constructed by reference to the antecedent. This provides the correct interpretation, i.e., the Spanish student of English, for the DP the Spanish one. It should be noted that since their analysis does not refer to any structural notions, it can also accommodate cases like (7) and (8), where the antecedents of do so and one are not continuous parts of the sentences.

C&J's analysis, however, cannot provide a principled account for well-known argument/non-argument asymmetries with respect to orphans. As shown in (3a) and (4), do so and one allow non-arguments to be their orphans; in the corner shop in (3a) and the Spanish in (4). On the other hand, do so and one do not allow arguments to be their orphans, as shown in (13) and (14):
(13) *John bought bread in the supermarket, and Bill did so milk in the corner shop.
(14) *John likes the Italian student of English, but not the Spanish one of French.

In (13, 14), the orphans include the arguments, milk and of French; the result is deviant. In order to accommodate this asymmetry, their analysis has to designate the orphan as a non-argument rather than an argument in CS. Under their notation of CS, arguments are placed in parentheses while non-arguments are separated off by a semicolon. In the CSs of (9, 10), the orphans are separated off by a semicolon, and therefore they are restricted to non-arguments. Although this notation makes the distinction between arguments and non-arguments, it only provides a stipulation, not an explanation, for this asymmetry.

Contrary to C&J’s analysis, this paper argues that the traditional assumption is correct in claiming that do so and one can only substitute constituents. I will argue that apparent counterexamples like (7, 8) straightforwardly follow from the interweave of Merge and Transfer within a phase.

2.2 A Proposal

Section 2.1 has pointed out the puzzling fact that the antecedents of do so and one are not necessarily continuous parts of sentences. In this section, I will argue that the traditional observation that only constituents can function as the antecedents of do so and one anaphora is correct, and that the puzzling fact can be accounted for by the interweave of Merge and Transfer within a phase.

Let us consider (7a) and (8c) (repeated here as (15) and (16)) as examples:

(15) Robin slept for twelve hours in the bunkbed, and Leslie did so for eight hours.
(16) Jane has a big black dog, and Jean has a brown one.

This paper assumes that the interpretations of do so and one anaphora should be determined at LF by copying their antecedent. Let us first consider do so, taking (15) as an example. During the derivation of its first conjunct Robin slept for twelve hours in the bunkbed, we construct the following vP structure, where the argument Robin is merged cyclically:

(17) [vP Robin [v [VP sleep]]]

It should be noted that this vP is "saturated," since it does not contain any probe or selector that needs to be satisfied. Hence, we may apply Transfer at stage (17) or later within the vP phase. Suppose that before we apply Transfer, we merge an
adjunct. Since there is no ordering restriction on applications of postcyclic merger of adjuncts, we merge either for twelve hours or in the bunkbed at this stage. Suppose that we merge in the bunkbed first, which yields structure (18):

(18) \[\lfrown v \lfrown [v \lfrown [v \lfrown \text{[in the bunkbed]]}]]\]

At this stage, we apply LF-Transfer in the vP phase. Let us assume with Chomsky (2004; 2005; 2006) that PF/LF-Transfer sends the complement of a phase head to the PF/LF component. In the present case, LF-Transfer sends the complement of the phase head \(v\), i.e. the larger VP sleep in the bunkbed to the LF-component, as depicted below:

(19) \[\lfrown v \lfrown [v \lfrown [v \lfrown \text{[in the bunkbed]]}]]\]

\[\frac{}{\text{LF-Transfer}}\]

The VP anaphor do so in the second conjunct copies this LF-transferred VP in the first conjunct, which yields the interpretation that the antecedent of do so is sleep in the bunkbed. We then adjoin for twelve hours to the smaller VP postcyclically, yielding (20):

(20) \[\lfrown v \lfrown [v \lfrown [v \lfrown \text{[for twelve hours]]} \text{[in the bunkbed]]}]\]

At this stage, we apply PF-Transfer in the vP phase, which sends the complement of the phase head \(v\), i.e. the largest VP sleep for twelve hours in the bunkbed, to the PF-component:

(21) \[\lfrown v \lfrown [v \lfrown [v \lfrown \text{[for twelve hours]]} \text{[in the bunkbed]]}]\]

\[\frac{}{\text{PF-Transfer}}\]

This PF-Transferred VP is subject to linearization in the PF-component.¹ Let us consider how to linearize this PF-Transferred VP, especially the two rightward (right-adjoined) adjuncts.

This paper basically adopts Kayne’s (1994) antisymmetric theory of phrase structure, which is based on the hypothesis that what is structurally higher necessarily precedes what is lower (i.e., the Linear Correspondence Axiom). Following Takano (2003), however, I assume that Kayne’s antisymmetric view should be weakened. More specifically, rightward merger (rightward adjunction), which should not be allowed in the antisymmetric hypothesis, is needed to account for rightward adjuncts like for twelve hours and in the bunkbed in (21); such adjuncts are not subject to the antisymmetric hypothesis. Takano’s
argument for positing rightward merger and thus weakening the antisymmetric hypothesis is made on the basis of the following facts (Branigan 1992: 45):

(22) a. John paints pictures at all well only rarely.
   b. John tells jokes with any gusto only occasionally.

In (22), the adjunct Negative Polarity Items (NPIs) at all and with any gusto are licensed by the rightmost adjuncts only rarely and only occasionally, respectively, which indicates that the rightmost adjuncts are located structurally higher than the preceding adjunct NPIs. This has led Takano to conclude that in the case of rightward adjuncts, what is structurally lower precedes what is higher. One might argue that rightward merger is not the only way to derive (22); there is a way of deriving (22) in accordance with the antisymmetric hypothesis. (22a), for example, could be derived by generating the licensing rightmost adjunct only rarely in a structurally higher position than the phrase containing the NPI paints pictures at all well, and moving paints pictures at all well over only rarely, as shown in (23). It should be noted that this analysis requires that the NPI at all should be licensed by only rarely under reconstruction:

(23) a. John only rarely [paints pictures at all well].
   b. John [\(\alpha\) paints pictures at all well] only rarely \(t_\alpha\).

Takano points out, however, that this antisymmetric analysis is untenable, since NPIs cannot be licensed under reconstruction, as observed by, among others, Laka (1990) and Phillips (1996):

(24) a. *[Buy any records]; she didn’t \(t_i\). (Laka 1990: 195)
   b. *[Whose theory about anything]; does John not like \(t_i\)? (Phillips 1996: 53)

Given this property of NPIs, (22a) cannot involve derivation (23). Hence, the rightmost licensing adjuncts in (22) must be merged rightward (right-adjoined to VP) in a structurally higher position than the preceding NPIs. According to this "weakly antisymmetric" hypothesis, the PF-Transferred VP, i.e., the largest VP, in (21) is correctly assigned the linear order sleep for twelve hours in the bunkbed. Hence, the interweave of Merge and Transfer within a phase enables us to account for (15), where the antecedent of do so is sleep in the bunkbed, which is a discontinuous part of the sentence.

Let us next consider one, taking (16) as an example. Let us assume with, among others, Chomsky (2006) that in addition to CP and vP, DP also counts as a phase. During the derivation of its first conjunct Jane has a big black dog, we construct the following DP structure, where a and dog are merged cyclically:
(25) \[ \text{DP a [NP dog]} \]

It should be noted that this DP is "saturated," since it does not contain any probe or selector that needs to be satisfied. Hence, we may apply Transfer at stage (25) or later within the DP phase. Suppose that we merge an adjunct before we apply Transfer. We may merge either big or black postcyclically at this stage. Suppose that we first merge big, as shown in (26). At this stage, we apply LF-Transfer to this DP phase, sending the complement of the phase head D, i.e. the larger NP big dog, to the LF-component:

(26) \[ \text{DP a [NP big [NP dog]]} \] (LF-Transfer)

Then, the NP anaphor one copies this LF-transferred NP big dog in the first conjunct, which results in the interpretation that the antecedent of one is big dog. We then merge (adjoin) black to the smaller NP postcyclically, yielding (27). At this stage, we apply PF-Transfer, sending the complement of D, i.e. the largest NP big black dog, to the PF-component:

(27) \[ \text{DP a [NP big [NP black [NP dog]]]} \] (PF-Transfer)

Linearization applies to this PF-Transferred NP, yielding the linear order big black dog:

Hence, we can account for (16), where the antecedent of one is big dog, a discontinuous part of the sentence.

Our analysis can also account for the argument/non-argument asymmetry with respect to do so and one anaphora, which C&J cannot account for in a principled way. Recall that although do so and one can co-occur with non-arguments, they cannot co-occur with arguments, as shown in (13) and (14) (repeated here as (28) and (29)):

(28) *John bought bread in the supermarket, and Bill did so milk in the corner shop.
(29) *John likes the Italian student of English, but not the Spanish one of French.

Let us consider (28) as an example. Under our analysis, the adjunct in the supermarket in the first conjunct may be merged before or after PF/LF-Transfer in the vP phase. Suppose that it is merged after PF-Transfer and LF-Transfer. The argument bread, on the other hand, must be merged cyclically, i.e., before PF-Transfer and LF-Transfer, in the vP phase, as shown (30). At this stage, we apply PF-Transfer and LF-Transfer, sending the complement of v to the PF- and LF-components:
(30) \([v \text{ [VP buy bread]] (\text{PF-Transfer and LF-Transfer})]\)

The argument bread, therefore, must be part of the LF-Transferred VP. This LF-Transferred VP is copied by do so in the second conjunct, which yields (31):

(31) ... Bill Tense buy bread milk in the corner shop.

In (31), the verb buy would have two objects at LF, \(i.e.,\) bread and milk, which violates the 0-criterion; the deviance of (28) follows. (29) can be accounted for in the same way.

2.3 Against “Hidden” Movement Analyses

One might argue that examples like (7) and (8), where the antecedents of do so and one are not continuous parts of sentences, could be accounted for without recourse to the interweave of Merge and Transfer if we assume "hidden" movement operations. Under “hidden” movement analyses, there would be a stage of derivation where the discontinuous parts are constituents. Let us consider (15) (repeated here as (32)) again as an example:

(32) Robin slept for twelve hours in the bunkbed, and Leslie did so for eight hours.

We would first generate underlying structure (33):

(33) \([v \text{ [VP [VP sleep [in the bunkbed]] [for twelve hours]]}]\)

The VP-anaphor do so would substitute the intermediate VP sleep in the bunkbed, which would be a constituent at this stage. In order to derive the surface order, we would either move in the bunkbed rightward over for twelve hours, as shown in (34), or move in the bunkbed leftward followed by remnant movement of the VP, as shown in (35):

(34) \([v \text{ [VP [VP sleep [for twelve hours] [\(\alpha\) in the bunkbed]]] [for twelve hours]]}]\)
(35) \([v \text{ sleep [for twelve hours] [\(\alpha\) in the bunkbed] tVP}]\)

The "hidden" movement analysis is implausible, however, since the "hidden" movement operations involved here are not motivated by any principles, but stipulated simply for the purpose of making the discontinuous parts function as antecedents and yielding the correct surface order. Furthermore, as argued by C&J, there is evidence to cast doubt on the "hidden" movement analysis; there is

(36) a. the man arrested in the park who was carrying a rifle
   b. *the man who was carrying a rifle arrested in the park

As shown in (36), when the two adjuncts arrested in the park and who was carrying a rifle modify the same NP man, the former must precede the latter. Let us then consider the following example:

(37) the man arrested in the park who was carrying a rifle and the one found hiding in the gazebo  [one = man who was carrying a rifle]  
    (Culicover and Jackendoff 2005: 138)

In (37), the antecedent of one is a discontinuous part of the sentence, i.e., man who was carrying a rifle. Under the "hidden" movement analysis, the underlying structure of (37) would be as follows:

(38) [DP the [NP [NP man] [who was carrying a rifle]] [arrested in the park]]

The NP anaphor one would substitute the intermediate NP man who was carrying a rifle. We would then either move who was carrying a rifle rightward over arrested in the park or move who was carrying a rifle leftward followed by remnant movement of the NP; this would yield the correct surface order. Although it is mechanically possible for the "hidden" movement analysis to arrange a derivation that creates the antecedent man who was carrying a rifle for the purpose of the NP anaphora one, it would have to assume underlying structure (38), which cannot exist on the surface, as shown by the deviation of (36b). This casts serious doubt on the "hidden" movement analysis. Our analysis, on the other hand, can account for (37) without positing any non-existent structure throughout its derivation, as shown below:

(39) a. [DP the [NP man]]
   b. [DP the [NP [NP man] [who was carrying a rifle]]] (LF-Transfer)
   c. [DP the [NP [NP man] [arrested in the park]] [who was carrying a rifle]] (PF-Transfer)

First, as shown in (39a), the and man are merged cyclically. We then merge the adjunct who was carrying a rifle to the NP, as shown in (39b). At this stage, we apply LF-Transfer, sending the complement of D, i.e., the larger NP man who was carrying a rifle, to the LF-component. The NP anaphor one in the second conjunct copies this LF-transferred NP in the first conjunct, which correctly
yields the interpretation that the antecedent of one is man who was carrying a rifle. We then merge the other adjunct arrested in the park to the lower NP postcyclically, as shown in (39c). We apply PF-Transfer to (39c), correctly yielding the linear order man arrested in the park who was carrying a rifle. It should be noted that under our analysis, at no stage of this derivation do we have to posit structure (38), which cannot exist on the surface.

This section was concerned with the PF-LF mismatch phenomena regarding anaphoric expressions do so and one. I have argued that the interweave of Merge and Transfer within a phase enables us to account for the do so and one anaphor facts in a principled way. In the next section, I will argue that the interweave of Merge and Transfer can also account for radical reconstruction phenomena with Japanese scrambling, another instance of PF-LF mismatch phenomena.

3 Radical Reconstruction with Japanese Scrambling

Let us first consider the following examples (Saito 1989: 190):

(40) a. [John-ga Mary-ni [dare-ga kuru ka] osīeta] (koto)
   Nom   Dat who-Nom come Q taught (fact)
   'John told Mary Q who is coming.'

b. *[John-ga dare-ni [Mary-ga kuru ka] osīeta] (koto)
   Nom who-Dat Nom come Q taught (fact)
   'John told who Q Mary is coming.'

In (40), only the embedded clause, which is marked by the Q-morpheme ka, is an interrogative. While the wh-phrase dare-ga 'who' is contained within the embedded clause in (40a), the wh-phrase dare-ni 'who-Dat' is not in (40b). The contrast between (40a) and (40b) indicates that a wh-phrase must be contained within an interrogative clause. Let us next look at the following example:

(41) a. [Mary-ga [John-ga dono hon-o tosyōkan-kara karidasita
   Nom   Nom which book-Acc library-from checked-out
   Q want-to-know (fact)
   'Mary wants to know which book John checked out from the library.'

b. *[dono hon-o [Mary-ga [John-ga t tosyōkan-kara karidasita ka]
   siritagatteiru)](koto) (Saito 1989: 191-192)

(41b) is derived from (41a) by scrambling of the wh-phrase dono hon-o 'which book-Acc' to the matrix clause. Although the wh-phrase is not contained within the embedded interrogative clause, it can still take embedded scope. Based on
this fact, Saito (1989) argues that scrambling can be undone, i.e., the scrambled phrase can be totally reconstructed, in the LF-component. In (41b), the scrambled phrase is totally reconstructed in the LF-component, and contained within the interrogative clause; this satisfies the licensing condition on wh-phrases. It remains an unsettled question, however, why scrambling can be undone. I argue that this property of scrambling straightforwardly follows from the interweave of Merge and Transfer within a phase together with the assumption that scrambling is an optional movement (see, among others, Fukui 1993 and Saito and Fukui 1998). Given that scrambling is an optional movement and thus not triggered by any probe or selector, it should be treated on a par with merger of an adjunct. This allows scrambling to be interweaved with PF-Transfer and LF-Transfer within a phase.

Let us consider (41b). During its derivation, we construct the following vP structure cyclically:

\[(42) \left[ \text{[p John-ga} \ \left[ [\text{vP dono hon-o tosyokan-kara karidasu} \ v] \right] \right. \]
\[\text{-Nom which book-Acc library-from check-out} \]

At this stage, we apply LF-Transfer to (42) in the vP phase, sending the complement of the phase head v, i.e. the VP dono hon-o tosyokan-kara karidasu 'which book-Acc library-from check-out' to the LF-component:

\[(43) \left[ \text{[p John-ga} \ \left[ [\text{vP dono hon-o tosyokan-kara karidasu} \ v] \right] \right. \]
\[\text{-Nom which book-Acc library-from check-out} \]

It should be noted that the wh-phrase dono hon-o 'which book-Acc' is interpreted in-situ at LF before undergoing scrambling. Since it is contained within the embedded interrogative clause, it satisfies the licensing condition on wh-phrases. The wh-phrase dono hon-o 'which book-Acc' gets devoid of its LF-content at this stage. We then apply scrambling to dono hon-o 'which book-Acc', which only has its PF-content, and merge it with vP postcyclically, yielding (44). We apply PF-Transfer to (44) in the vP phase, sending the complement of v, i.e. the VP intendo tosyokan-kara karidasu 'ti library-from check-out' to the PF-component:

\[(44) \left[ \text{[vP dono hon-o} \ \left[ \text{[vP intendo tosyokan-kara karidasu} \ v] \right] \right. \]
\[\text{which book-Acc -Nom library-from check-out} \]

Linearization applies to this PF-transferred VP, yielding the linear order tosyokan-kara karidasu 'library-from check out'. It should be noted that the copy/trace left by scrambling is immune from linearization. The wh-phrase dono hon-o 'which book-Acc' undergoes successive cyclic movement to its final landing site, i.e., the matrix TP-adjoined position, as shown in (45):

\[(45) \left[ \text{[vP dono hon-o} \ \left[ \text{[vP intendo tosyokan-kara karidasu} \ v] \right] \right. \]
\[\text{which book-Acc -Nom library-from check-out} \]
(45)  [tp dono hon-o | tp Mary-ga | John-ga ...
   which book-Acc      -Nom      -Nom

We apply PF-Transfer as well as LF-Transfer in the matrix CP phase, sending
the complement of the phase head C, i.e. the larger matrix TP, to the PF- and
LF-components. It is important to note that the scrambled phrase dono hon-o
'which book-Acc', which has already been transferred to the LF-component in
the embedded vP phase, is transferred to the PF-component and hence assigned
its linear order at this stage. The wh-phrase dono hon-o 'which book-Acc'
receives its LF interpretation in-situ in the embedded vP phase (43), and then
receives its PF-interpretation at the matrix TP-adjointed position in the matrix CP
phase (45). Hence, our analysis can account for the radical reconstruction
property of Japanese scrambling.3

4. Conclusion

In this paper, I have proposed that merger of an adjunct, but not merger of an
argument, may be interweaved with PF-Transfer and LF-Transfer within a phase.
It is shown that our analysis gives us a unified account of the two puzzling
PF-LF mismatch phenomena which have been assumed to be totally unrelated to
each other, i.e. do so and one anaphora and the radical reconstruction property of
Japanese scrambling.

Notes

* I would like to thank the audience at WECOL 2007 for helpful comments and discussions. Remaining errors and omissions are, of course, the sole responsibility of the author. This work was
supported in part by the Japan Society for the Promotion of Science under grant Scientific Research
C 1920436 and by a grant from the Institute of Humanities at Meiji University.

1 Assuming the previous minimalist model, Nissenbaum (2000) argues that Spell-Out (PF-Transfer
in the present term) may apply before merger of an adjunct and thus merger of an adjunct may be
interweaved with PF-Transfer within a phase. Our analysis differs from Nissenbaum’s in that not
only PF-Transfer but also LF-Transfer may be interweaved with merger of an adjunct within a phase,
which enables us to account for PF-LF mismatch phenomena which are to be presented below.

1 I argue that the adjunct for twelve hours, which has not been transferred to the LF-component in
this vP phase, undergoes LF-Transfer in the next CP phase. A question arises how the adjunct, which
is within VP, is still accessible in the next CP phase. Given the definition of domination based on the
category/segment distinction proposed by May (1985), the adjunct for twelve hours is not dominated
by VP. I argue that those elements like the VP adjunct for twelve hours which are not dominated by
the transferred domain are still "accessible" and thus may undergo Transfer in the next phase.

2 Note that the adjunct black undergoes LF-Transfer at the next vP phase.

3 In what follows, I assume for expository purposes that Japanese is right-headed in its base
structure, which is contrary to Kayne’s (1994) universal Specifier-Head-Complement word order
hypothesis. It should be noted that discussions to follow hold irrespectively of whether Japanese is
right-headed or left-headed in its base structure.

Sauerland and Elbourne (2002) claim that scrambling is a PF-movement, which accounts for its
radical reconstruction property. Their analysis, however, cannot account for binding facts; there are
cases where scrambled phrases function as antecedents for anaphors and thus have effects on LF. In (i), for example, the scrambled phrase *karena-o ‘they-Gen’ functions as an antecedent for the reciprocal *otogai ‘each other’. (Saito 2003: 485):

(i) *karena-o [[otogai-no sensei]-ga \[kotona]] (koto) 
‘they-Gen each other-Gen teacher-Nom criticized (fact)’
‘Each other’s teacher criticized them.’

For further discussion of binding facts under the analysis proposed here, see Ishii (2007).

References


Chomsky, Noam. 2005. On phases. Ms, MIT.

Chomsky, Noam. 2006. Approaching UG from below. Ms, MIT.


Toru Ishii  
School of Arts and Letters  
Meiji University  
1-1 Kandasurugadai, Chiyoda-ku  
Tokyo 101-8301 JAPAN  
tishii@kise.meiji.ac.jp