Symmetries in Coordination

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Abstract

The main aim of this thesis is to investigate the nature of the Coordinate Structure Constraint (CSC), and to discuss implications of the results obtained from the investigation for the theory of grammar.

Chapters 2 and 4 argue that the CSC should be regarded as an LF representational constraint, rather than a derivational constraint on movement. Potentially, the evidence in favor of the LF representational approach comes from two directions. The first type of evidence may come from cases where a non-ATB movement occurs but no CSC effect is observed, and the second type may come from cases where no movement occurs but a CSC effect is observed. It is shown that we can actually find both types of evidence.

Chapter 3 discusses a theoretical implication of the LF view of the CSC for Japanese syntax. It is argued that the fact that Japanese scrambling exhibits CSC effects, in conjunction with the LF nature of the CSC, indicates that it is not total reconstruction but partial reconstruction that Japanese scrambling can undergo: That is, reconstruction of a scrambled phrase leaves something behind in its scrambled position.

Chapter 5 argues against a PF approach to the CSC. First, several empirical problems with this approach are pointed out, and then, some data which appear to be

accounted for under the PF approach but not under the LF approach are examined and shown to pose no real problem for the latter approach.

Chapter 6 addresses the issue of why ATB distribution of in-situ *wh*-phrases is possible in Japanese, while it is impossible in English. It is argued that the contrast can be explained under the hypothesis that in Japanese, but not in English, *wh*-in-situ is licensed through null operator movement.

Chapter 7 takes up the issue of why scrambling of an object in the first VP conjunct across the subject does not result in unacceptability, although scrambling of an object in the second VP conjunct exhibits a CSC effect. It is argued that this puzzle can be solved if we assume that the subject can remain within VP in Japanese.

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Chapter 1
Introduction

The main aim of this thesis is to investigate the nature of the Coordinate Structure Constraint (CSC), and discuss implications of the results gained from the investigation for the theory of grammar.

1.1 The Nature of the CSC

Since Ross 1967, the ungrammaticality of examples as in (1) has been attributed to the Coordinate Structure Constraint (CSC), the standard formulation of which is given in (2).

(1) a. *What did Mary [send *t* on Monday] and [receive the parcel on Wednesday]?

b. *That boy, the dog [bit Bill this morning] and [chased *t* last night].

(2) *Coordinate Structure Constraint (CSC)*

In a coordinate structure, no element contained in a conjunct may be moved out of that conjunct (cf. Ross 1967).[1]

[1] This is only a part of Ross's original CSC. See 1.3.1 below.

In (1a), *wh*-movement occurs only from the first conjunct, and in (1b), topicalization occurs only from the second conjunct. Both of these extractions violate the CSC in (2).

The main issue I address in this thesis is: What is the nature of the CSC? In particular, at which level in the grammar does it apply?

The CSC was originally proposed as a sort of island constraint, and island constraints are standardly considered to ban particular applications of movement transformations. Thus, one possible approach to the CSC is to view it as a constraint on movement. Under this view, what the CSC bans is a derivational step which moves an element out of a conjunct (cf., for example, Johnson 2002, Postal 1998, Ross 1967). When linguists try to realize whether a given construction involves movement by seeing whether it exhibits CSC effects, they implicitly assume this view. Another possible approach, which has been pursued by a number of researchers, is to view the CSC as a constraint on LF (or semantic) representations (e.g., Fox 2000, Goodall 1987, Kehler 1996, Lin 2001, Moltman 1992, Muadz 1991, Munn 1993, Ruys 1993). In this approach, a movement out of a conjunct *per se* is harmless, and what may induce a violation of the CSC is the LF representation resulting from the movement. I argue in Chapters 2 and 4 that the LF representational approach is superior to the derivational approach.

An increasing number of current works suggest that locality effects on movement should be viewed as PF phenomena (e.g., Bošković 2002, Kasai and Takahashi 2001, Lasnik 2000, Merchant 2001, Pesetsky 1997, 1998; but see also Boeckx and Lasnik 2006, Kato 2004). In the presence of such works, there is another possibility to consider concerning the nature of the CSC, namely the possibility that the constraint is a PF

constraint and as such applies at the PF interface. I argue in Chapter 5 that this line of approach is not successful, and that CSC effects should not be dealt with in terms of PF.

As a whole, this thesis argues that the CSC is to be best viewed as a constraint on LF representations. The version of the LF representational CSC to be argued for is based on the assumptions in (3) (adapted from Fox 2000: 50; see also Goodall 1987, Lin 2001, Moltman 1992, Muadz 1991).

(3) *LF Representational CSC*

a. A sentence with a coordinate structure is well-formed only if each of its component structures independently satisfies grammatical constraints.

b. Component structures of a sentence with a coordinate structure $=_{def}$ structures each of which is composed of one of the conjuncts together with the material which is not included by the coordinate structure

The "grammatical constraints" in (3a) should be understood to be the ones independently proposed outside the context of coordination, and in this sense, strictly speaking, there is no such thing as the "CSC" in this approach.

Consider the ungrammaticality of (1a) in light of the LF Representational CSC in (3). According to (3b), the two component structures of the example are (4a) and (4b).

(4) *Component structures of (1a)*

a. what did Mary send *t* on Monday

b. what did Mary receive the parcel on Wednesday

In (4b), a ban on vacuous quantification is violated since the fronted *wh*-phrase fails to bind any variable. According to (3a), this ill-formedness of one of its component structures makes the entire example ungrammatical. Note that under the LF representational approach being considered here, the CSC effect in (1a) is attributed ultimately to a constraint on LF representations proposed independently of coordination: the ban on vacuous quantification. In this sense, the CSC is a representational constraint in this approach.

1.2 The Total Reconstruction Property of Japanese Scrambling

One of the domains for which the LF nature of the CSC has a theoretical implication is Japanese scrambling. As is well-known, Japanese is a language in which word order is relatively free. For example, a sentence with three arguments exhibits six possible word orders, as shown below:

(5) a. Taroo-ga sensei-ni Hanako-o syookaisita.
T.-Nom teacher-Dat H.-Acc introduced
'Taroo introduced Hanako to his teacher.'

b. Taroo-ga Hanako-o sensei-ni syookaisita.

c. Sensei-ni Taroo-ga Hanako-o syookaisita.

d. Hanako-o Taroo-ga sensei-ni syookaisita.

e. Sensei-ni Hanako-o Taroo-ga syookaisita.

f. Hanako-o sensei-ni Taroo-ga syookaisita.

Traditionally, this word order permutation has been analyzed as resulting from a movement operation called scrambling (cf. S.-I. Harada 1977, Saito 1985).

The following set of data shows that a scrambled phrase can be reconstructed in Japanese:

(6) *Reconstruction effect with scrambling*

a. **Toyota-sae$_i$**-ga [**so-ko$_i$**-no kogaisya]-o suisensita.
T.-even-Nom that-place-Gen child:company-Acc recommended
'Even Toyota recommended its subsidiary.' (Ueyama 1998: 128)

b. ?*[**So-ko$_i$**-no oyagaisya]-ga **A-sya-ni-sae$_i$** Toyota-o
that-place-Gen parent:company-Nom **A-company-Dat-even** T.-Acc
suisensita.
recommended.
'Its parent company recommended Toyota to even Company A.' (ibid.: 130)

c. [**So-ko$_i$**-no kogaisya]-o$_j$ **Toyota-sae$_i$**-ga t_j suisensita.
that-place-Gen child:company-Acc **T.-even**-Nom recommended
'Even Toyota recommended its subsidiary.' (ibid.: 149)

The contrast between (6a) and (6b) indicates that the bound pronoun *so-ko* 'that-place' must be c-commanded by a coreferential nominal. On the surface, this requirement seems not to be met in (6c), where the scrambled phrase containing a bound pronoun appears in the sentence-initial position. However, in this example, the scrambled phrase undergoes reconstruction into its base position and satisfies the licensing condition on bound pronouns there.

Since Saito 1989, it has widely been believed among linguists working on Japanese syntax that Japanese scrambling, due to its semantic vacuity, can undergo total (or radical) reconstruction (cf., e.g., Saito 1989, 1994, Tada 1993). Total reconstruction is a kind of reconstruction which does not leave any trace or copy behind. Under this total reconstruction hypothesis, for example, sentence (6c) is assumed to be able to be associated with the same LF representation as (6a). In this LF representation, the scrambled phrase has been reconstructed without leaving anything in its scrambled position, with the result that it looks as if the scrambling had not taken place.

The total reconstruction property of Japanese scrambling has attracted much attention, and a number of elaborate analyses have been proposed for it (Bošković and Takahashi 1998, Fukui and Kasai 2004, Kawamura 2004, Kitahara 2002, Saito 2003, Sauerland and Elbourne 2002, among many others). However, to the best of my knowledge, no serious effort has been made to find the empirical evidence that the reconstruction which scrambling undergoes is really total (although Saito (1989) offers a conceptual reason to assume so).

The LF nature of the CSC, once established, has a grave implication for the reconstruction property of Japanese scrambling. Under the hypothesis that Japanese scrambling can undergo total reconstruction, the LF nature of the CSC leads us to predict that Japanese scrambling does not exhibit CSC effects. It is shown in Chapter 3 that this prediction is not borne out (cf. Tokashiki 1989, Kato 2006). The logical conclusion which we should draw from this observation is that Japanese scrambling cannot undergo total reconstruction although it is widely believed to be able to do so, and that the type of reconstruction it can undergo is in fact partial reconstruction: That is, reconstruction of a

scrambled phrase leaves behind something in its scrambled position (see also Miyagawa 2005a, to appear, Tanaka 2003). As to the nature of the partial reconstruction, I propose the following hypothesis:

(7) *Partial reconstruction hypothesis on Japanese scrambling*

Scrambled phrases may undergo partial reconstruction in Japanese. Semantic features (e.g., features relevant to binding and scope) can be reconstructed, or deleted in the moved positions at LF, while formal features (e.g., phi- and categorial features) cannot.

The denial of the total reconstruction property of Japanese scrambling will urge us to look at this operation in a new light.

1.3 What the Present Thesis Is Not Concerned with

There are many things one might expect this thesis to deal with, which is an empirical and theoretical investigation of coordinate structures, but which in fact it is not concerned with. Three of them that seem worth mentioning at this point are the Null Conjunct Condition, the structure for coordination, and exceptions to the CSC involving asymmetrical coordination, to which we now turn.

1.3.1 Null Conjunct Condition

Ross's (1967) original formulation of the CSC is different from the one I gave in (2). Ross's original formulation is the following:

(8) *Ross's (1967) original CSC*

In a coordinate structure, no conjunct may be moved, nor may any element contained in a conjunct be moved out of that conjunct.

Obviously, this constraint consists of two parts. The first part bans extraction *of* conjuncts, and the second part bans extraction *out of* conjuncts. The second part corresponds to the "CSC" in (2), and, as seen above, explains the ungrammaticality of examples like (1a) and (1b). The first part accounts for the ungrammaticality of examples like the following:

(9) *Extraction of conjuncts*

a. *What did Mary buy a bike and *t*?

b. *That boy, the dog bit *t* and this girl.

Grosu (1973, 1981) and Merchant (2001) argue that the two parts of Ross's CSC are of different nature and should receive different treatments. The difference between those two parts can be illustrated by the following examples, which show that across-the-board (ATB) extraction can violate the "extraction *out of* conjuncts" part but not the "extraction *of* conjuncts" part (Grosu 1973, 1981, Ross 1967):

(10) What did Mary [send *t* on Monday] and [receive *t* on Wednesday]?

(11) a. *Which books did Bob read *t* and *t*?

b. *I wonder who you saw *t* and a picture of *t*.

c. *I wonder who you saw a picture of *t* and *t*. (Gazdar et al. 1985)

Based on this and other observations, the above authors claim that the "extraction *of* conjuncts" part of Ross's CSC should be viewed as a PF condition which has nothing to do with extraction. Grosu (1981) formulates this condition, which he calls the Null Conjunct Condition, as follows:[2]

(12) *Null Conjunct Condition (Grosu 1981: 56)*

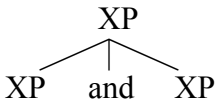
Conjuncts may not be phonetically null.

Following Grosu and Merchant, I distinguish the two parts of Ross's CSC in this thesis and focus on the "extraction *out of* conjuncts" part (= (2)), using the term "CSC" in the sense of (2) in what follows.

1.3.2 Structure for coordination

Various proposals have been advanced to incorporate coordination into the theory of phrase structure, especially since the advent of X'-theory (see Progovac 2003 for a review of such theories). In this thesis, I do not commit myself to the issue of precisely how coordinate structures should be analyzed in hierarchical terms, indicating them as if they had a flat, multi-headed structure, as conceived in traditional theories, as shown in (13).

(13)



[2] Grosu and Merchant assume that the "extraction *out of* conjuncts" part is a condition on movement, but, as mentioned above, this is different from my position, which is that the part is to be regarded as an LF condition.

Although I keep the issue at a distance, I would like to suggest that the view of the CSC to be defended here follows rather naturally from a multi-dimensional approach to coordination (Chomsky 1982, Goodall 1987, Grootveld 1994, Moltmann 1992, Muadz 1991, de Vries 2005, among others). In this approach, conjuncts are assumed to form parallel structures, or appear on different planes. In a theory like the ones proposed by Goodall, Moltmann, and Muadz, the structure of sentence (14) can be represented as in (15) (I put aside the issue of how the conjunction is to be represented under their analyses).

(14) John ate an apple and drank coffee.

(15) John  ate an apple
drank coffee

Since the conjuncts are assumed to be on different planes, (14) should appear in different forms on different planes. On the assumption that the part of the sentence above the coordinate structure is shared by the two planes, the sentence should appear on one plane in the form of (16a) and on the other plane in the form of (16b).

(16) a. John ate an apple.
b. John drank coffee.

It should be noted here that the two substructures (16a) and (16b), which appear on the two different planes, are the two component structures of sentence (14) (see the definition of component structure in (3b) above). In other words, under a multi-dimensional approach, different component structures appear on different planes. Now, it seems to

make sense to say that (at least some) grammatical constraints apply independently on each plane, and if so, condition (3a), the core of the LF Representational CSC, follows. The condition is repeated below:[3]

(17) A sentence with a coordinate structure is well-formed only if each of its component structures independently satisfies grammatical constraints.

In spite of this advantage from a viewpoint of the LF Representational CSC, the multi-dimensional analyses of coordination assuming a structure as in (15) face an empirical problem: Although in these analyses the conjuncts are conjoined symmetrically and have equal status with respect to the conjunction and the top node of the coordinate structure, there are ample data showing asymmetries among conjuncts (see Progovac 2003, and references cited therein).[4] For example, in a head-initial language, the second conjunct forms a unit with the conjunction, but not the first conjunct, as illustrated by the following set of examples (Ross 1967):

(18) *An asymmetry among conjuncts*

a. John left, and he didn't even say good-bye.

b. John left. And he didn't even say good-bye.

c. *John left and. He didn't say good-bye.

---

[3] It should be noted that if the reasoning here is on the right track, we can reformulate the LF Representational CSC in (3) as (i), which does not make a specific reference to coordinate structures.

(i) Grammatical constraints are checked independently on each plane.

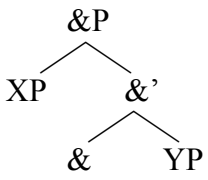
[4] I thank Cedric Boeckx for calling my attention to the importance of the issue discussed in this and the following paragraphs. See te Velde 2006 for more discussion about symmetries and asymmetries in coordination.

The multi-dimensional analyses in question cannot deal with this type of data, and in this respect, they are similar to the traditional analysis in (13).

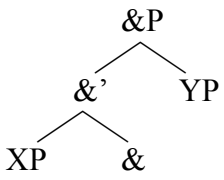
Because of the existence of the asymmetries among conjuncts, a number of hierarchical analyses for coordination have been advanced. These analyses assume that the conjuncts are linked asymmetrically, or located in hierarchically different positions in a coordinate structure (cf. Johannessen 1998, Kayne 1994, Munn 1993, Zoerner 1995, among many others; see also Progovac 2003 for a review of some major asymmetrical analyses). For example, Johannessen and Zoerner propose structures as in (19a) and (19b) for head-initial languages and head-final languages, respectively, where one conjunct occupies the specifier position and another occupies the complement position of a conjunction phrase (&P).

(19) *Analysis of coordination à la Johannessen (1998)/Zoerner (1995)*

a.



b.



The hierarchical/asymmetrical analyses can capture at least some of the reported asymmetries among conjuncts, and, in this respect, are superior to the symmetrical multi-dimensional analyses seen above.

Here I would like to point out that multi-dimensional analyses and hierarchical/asymmetrical analyses of coordination are, in principle, not incompatible with each other and mutually exclusive. It is in fact possible to develop a theory in which conjuncts are hierarchically positioned, and, at the same time, appear on different planes.

There are several researchers arguing for such a hybrid theory (see Grootveld 1994 and de Vries 2005, among others). For example, de Vries proposes a multi-dimensional analysis which assumes an asymmetrical structure à la Johannessen/Zoerner. I hope that to the extent that such a theory is possible, the asymmetries among conjuncts reported in the literature are not a serious problem for multi-dimensional approaches to coordination, from which the LF representational analysis of CSC effects to be defended in this thesis naturally follows.

1.3.3 Exceptions to the CSC involving asymmetrical coordination

In (20a), the conjunct order does not affect the truth value of the sentence, so that (20a) and (20b) are true exactly under the same circumstances.

(20) *Symmetrical coordination*

a. John [likes Mary] and [hates Sue].

b. John [hates Sue] and [likes Mary].

However, this is not always the case. For example, in (21a) below, the conjunct order does affect the truth value of the sentence, so that (21a) may be true under different circumstances from (21b). (Indeed, (21b), but not (21a), is pragmatically odd).

(21) *Asymmetrical coordination*

a. John took poison and died.

b. #John died and took poison.

We can state the difference between the type of coordination as in (20) and that as in (21) in the following way: In the former, the conjuncts are linked by a symmetrical semantic relation, while in the latter, the conjuncts are linked by an asymmetrical semantic relation. Thus, the former type of coordination can be called symmetrical coordination, and the latter asymmetrical coordination.

It has been observed in the literature that the CSC can be violated in some cases of asymmetrical coordination (see Culicover and Jackendoff 1997, Goldsmith 1985, Lakoff 1986, Postal 1998, and Ross 1967, among others). Some relevant examples are given in (22).

(22) *Exceptions to the CSC*

a. the stuff which$_i$ Arthur sneaked in and stole t_i

b. [How many dogs]$_i$ can a person have t_i and still stay sane?

c. That is the drug which$_i$ athletes take t_i and become quite strong.

(Postal 1998: 53)

In this thesis, I do not discuss such exceptions to the CSC involving asymmetrical coordination, with the hope that whatever analysis turns out to be correct for them, it will not affect my arguments here.

1.4 Japanese VP Coordination

Some of the data to be discussed in this thesis come from Japanese and they involve VP (or *v*P) coordination (in this thesis, I do not distinguish between VP and *v*P). The aim of

this section is to clarify the nature of the Japanese VP coordination constructions. It is not obvious at all, indeed.

The following is an example of English sentences with VP coordination:[5]

(23) Prof. Yamada praised Hanako and scolded Taroo.

This can be translated into Japanese at least three ways, as shown below:

(24) a. Yamada kyoozyu-ga Hanako-o *home* Taroo-o sikat-ta.
Y. prof.-Nom H.-Acc praise T.-Acc scold-Past

b. Yamada kyoozyu-ga Hanako-o *home-te* Taroo-o sikat-ta.
Y. prof.-Nom H.-Acc praise-ing T.-Acc scold-Past

c. Yamada kyoozyu-ga Hanako-o *home-ta* *sosite* Taroo-o sikat-ta.
Y. prof.-Nom H.-Acc praise-Past and T.-Acc scold-Past

In each of these sentences, the second verb is inflected for tense. The difference between them is that in (24a), the first verb takes a bare form;[6] in (24b), it takes a gerundive/participial form; and in (24c), it is in a finite form and followed by *sosite* 'and.' This is summarized in (25) below.

(25) a. …… V_{bare} …… V_{fin}.

b. …… $V_{ger/part}$ …… V_{fin}.

---

[5] But see Bošković and Franks 2000, where it is claimed that sentences like (23) may involve I'/T' coordination.

[6] The "bare form" of a verb whose stem ends with a vowel (e.g., *home* 'praise') is the same as the stem (*home*), while that of a verb whose stem ends with a consonant (e.g., *nom* 'drink') is "the stem + *-i*" (*nomi*).

c. …… V_{fin} and …… V_{fin}.

Takano (2004) argues that only the construction in (25a) involves coordination of VPs (see also Nakatani 2004, Tamori 1976/7, and Tokashiki 1989 for a similar claim). His argument receives empirical support from considerations of interpretive properties of the word *different*.

First, consider the following sentence:

(26) Bob and Alice attend different classes.

As discussed by Carlson (1987), this sentence is at least two-way ambiguous due to the interpretive properties of *different*. On one reading, (26) means that the classes Bob and Alice attend are different from the classes which have already been contextually defined. For example, if (26) is uttered right after Fred says "I attend Intermediate Syntax and Intro to Phonology," the most salient reading of (26) is that the classes Bob and Alice attend are different from Intermediate Syntax and Intro to Phonology. This reading will be called a *sentence-external reading*. On another reading, (26) means that the class Bob attends is different from the class Alice attends. This reading will be called a *sentence-internal reading*. Unlike (26), the sentence in (27) below allows only a sentence-external reading (i.e. it only means that the class Bob attends is different from Intermediate Syntax and Intro to Phonology, in the context used above).

(27) Bob attends a different class.

Carlson claims that a sentence-internal reading of *different* can only be licensed when the sentence denotes a plural eventuality. As shown in (26), coordinate/plural NPs

allow sentences to denote plural eventualities (in this thesis, I do not distinguish between NP and DP, simply referring to every nominal phrase as NP). The following examples show that coordinate V(P)s also sanction sentences expressing plural eventualities:

(28) a. John saw and reviewed different films.

b. Different dogs chased and bit the cat.

c. Different dogs chased John and bit Bill.

All of these examples allow a sentence-internal reading of *different*. For example, (28c) can mean that the dog which chased John is different from the dog which bit Bill.

Takano (2004) observes that the construction in (25a), but not the ones in (25b-c), allows a sentence-internal reading of *tigau*/*kotonaru*/*betubetuno* 'different.' This is illustrated by the examples in (29) (unlike the other two words, *betubetuno* forces sentence-internal readings, and perhaps a more appropriate translation of this word is 'separate,' as pointed out by Naoki Fukui (personal communication)).

(29) a. Tigau/Kotonaru/Betubetuno inu-ga John-o oikake Bill-o kan-da.
different dog-Nom J.-Acc chase B.-Acc bite-Past
'Different dogs chased John and bit Bill.'

b. Tigau/Kotonaru/*Betubetuno inu-ga John-o oikake-te Bill-o kan-da.
different dog-Nom J.-Acc chase-ing B.-Acc bite-Past
'A different dog chased John and then bit Bill.'

c. Tigau/Kotonaru/*Betubetuno inu-ga John-o oikake-ta sosite Bill-o
different dog-Nom J.-Acc chase-Past and B.-Acc
kan-da.
bite-Past
'A different dog chased John and it bit Bill.'

(Takano 2004: 117, footnote 11)

Of these three sentences, only (29a), which has the configuration in (25a), allows the sentence-internal reading of *tigau*/*kotonaru*/*betubetuno*. This indicates that only (25a), among the three constructions in (25), involves VP coordination.[7] Thus, using English words, the structure of (29a) can be represented as in (30).

(30) *Structure of (29a)*

$[_{IP}$ different dogs $[_{I'}$ $[[_{VP}$ John chase$]\&[_{VP}$ Bill bite$]]$ I^0+Pst$]]$

Here, "&" and "+Pst" stand for the phonologically null conjunction and the past tense affix (*-ta*), respectively. I assume, following Takano, that the tense morpheme is generated under I^0 and undergoes PF lowering to the adjacent verb, as shown in (31), with the result that only the second verb is inflected (cf. Chomsky 1957, Lasnik 1995c).[8]

[7] Naoki Fukui (personal communication) pointed out to me that he marginally accepts the sentential-internal reading of (29b). This might show that (25b) can also involve a coordinate structure. What is crucial here is, however, that examples with the configuration in (25a) involve a coordinate structure and we can safely make arguments concerning Japanese coordination based on them.

[8] A similar claim is made for Korean by Yoon (1993, 1994, 1997).

Takano claims that (29b), which has the configuration in (25b), has the structure shown in (ia), where the first object and the first verb form an adjunct clause, and that (29c), which embodies (25c), involves coordination of IPs, as shown in (ib).

(31) *PF affix-lowering*

$[_{IP} \ldots [_{VP} \ldots\ldots V]\&[_{VP} \ldots\ldots V]\ I^0\text{+Pst}]$

↑____|

In the following example, which also has a non-finite verb in the first conjunct, each conjunct has its own overt subject:

(32) [Taroo-ga ringo-o tabe] [John-ga koohii-o non-da]

T.-Nom apple-Acc eat J.-Nom coffee-Acc drink-Past

'Taroo ate an apple and John drank coffee.'

It is argued in Chapter 7 that the subject can remain within VP in Japanese (see also Fukui 1986, Kuroda 1988, and Takano 1996, among others). Thus, sentence (32) has a structure like the following:[9]

(33) $[_{IP} [_{VP}$ Taroo apple eat]&$[_{VP}$ John coffee drank]].

To sum up the discussion in this section, Japanese VP coordination takes the following form:[10]

(i) a. *Structure of (29b)*
$[_{IP}$ different dog_i $[_{I'/VP} [_{adjunct}\ pro_i$ John chase-ing] $[_{I'/VP}$ Bill bite I^0+Pst]]]
b. *Structure of (29c)*
$[_{IP}$ different dog_i John chase I^0+Pst] and $[_{IP}\ pro_i$ Bill bite I^0+Pst]

As the plausibility of Takano's structural analyses of these two constructions does not affect our discussion below, I do not discuss them in any detail here (see also footnote 7).

[9] For arguments against analyzing sentences with what I call VP coordination here as involving IP coordination, see Chapter 7. For the main purposes of this thesis, however, the precise size of coordination involved is not crucial.

[10] Because a coordinate structure may contain more than two conjuncts, the following schematic representation expresses the form of Japanese VP coordination more precisely:

(34) *Japanese VP coordination*

…… V_{bare} …… V_{fin}.

1.5 Organization of the Thesis

This thesis is organized as follows. Chapter 2 argues that the CSC should be regarded as an LF representational constraint, rather than a derivational constraint on movement. Potentially, the evidence in favor of the LF representational approach comes from two directions. The first type of evidence may come from cases where a non-ATB movement occurs but no CSC effect is observed, and the second type may come from cases where no movement occurs but a CSC effect is observed. It is shown that we can actually find both types of evidence. The first type of evidence is provided by covert *wh*-movement/QR (Fox 2000, Ruys 1993) and the English gapping construction (Lin 2001), and the second type of evidence can be found in Japanese topic and relative clause constructions.

Chapter 3 discusses a theoretical implication of the LF view of the CSC for Japanese syntax. First, it is pointed out that although it is widely believed that Japanese scrambling can undergo total reconstruction, there seems to be no reason, empirical or conceptual, to believe that the reconstruction effect exhibited by Japanese scrambling must be total, rather than partial. Then, it is argued that the fact that Japanese scrambling

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(i) *Japanese VP coordination*
(……. V_{bare}) …… V_{bare} …… V_{fin}.

Although *sosite* 'and' can be inserted after each non-final verb, its appearance is optional. In this thesis, I only examine sentences with a coordinated VP where no overt conjunction appears.

exhibits CSC effects indicates in conjunction with the LF nature of the CSC that this operation cannot undergo total reconstruction (see also Miyagawa 2005a, to appear, Tanaka 2003). Thus, I claim that the type of reconstruction available to Japanese scrambling is partial reconstruction, which leaves something (or some features) behind in the scrambled position.

Chapter 4 provides further support to the LF representational approach to the CSC. I examine the behavior of Japanese negative concord items in the context of VP coordination. It is first demonstrated that Japanese has the operation of Neg-raising and that it is subject to the principle of Last Resort (or Scope Economy (Fox 1995, 2000)). It is then argued that this last resort nature of Neg-raising provides a piece of evidence for the LF nature of the CSC. Specifically, the evidence comes from the observation that Neg-raising which occurs in a non-ATB manner does not induce a CSC effect.

Chapter 5 argues against a PF approach to the CSC. First, I point out several empirical problems with this approach, and second, I examine some data which appear to be accounted for under the PF approach but not under the LF approach, claiming that they pose no real problem for the latter approach.

The thesis ends with two chapters which address certain remaining issues left in the previous chapters and discuss their implications. Chapter 6 addresses the issue of why ATB distribution of in-situ *wh*-phrases is possible in Japanese, while it is impossible in English. It is argued that the contrast can be explained under the hypothesis that in Japanese, but not in English, *wh*-in-situ is licensed through null operator movement. Thus, to the extent that my analysis succeeds, the above contrast lends support to the null operator approach to Japanese *wh*-in-situ (Watanabe 1992a, b; cf. also Hagstrom 1998).

Chapter 7 takes up the issue of why scrambling of an object in the first VP conjunct across the subject does not result in unacceptability, although scrambling of an object in the second VP conjunct exhibits a CSC effect. It is argued that this puzzle can be solved if we assume that the subject can remain within VP in Japanese (cf., e.g., Fukui 1986, Kuroda 1988, Takano 1996). Arguments against analyzing sentences with what is called VP coordination here as IP coordination are also provided.

Chapter 8 summarizes the discussion in each preceding chapter.

Chapter 2
The LF Nature of the CSC

2.1 Derivational and Representational Approaches to the CSC

(1) is the well-known Coordinate Structure Constraint (CSC), which was proposed by Ross (1967), and its effect is illustrated by the example in (2).

(1) *Coordinate Structure Constraint (CSC)*

In a coordinate structure, no element contained in a conjunct may be moved out of that conjunct.

(2) *What did Mary [send *t* on Monday] and [receive the parcel on Wednesday]?

One of the main issues I address in this thesis is the nature of the CSC. Specifically, at which level in the grammar doe it apply?

The CSC was originally proposed as a sort of island constraint, and island constraints are standardly considered to ban particular applications of movement transformations. Thus, one possible approach to the CSC is to view it as a constraint on movement. In this approach, what the CSC bans is a derivational step which moves an element out of a conjunct (cf., e.g., Johnson 2002, Postal 1998, Ross 1967). I will refer to

this approach as the *derivational approach* and the CSC under this approach as the *Derivational CSC*.

Another possible approach, which has been pursued by a number of researchers, is to view the CSC as a constraint on LF (or semantic) representations (cf., e.g., Fox 2000, Goodall 1987, Kehler 1996, Lin 2001, Moltmann 1992, Muadz 1991, Munn 1993, Ruys 1993). In this approach, a movement out of a conjunct *per se* is harmless, and what may induce a CSC effect is the LF representation resulting from the movement. I will refer to this approach as the *(LF) representational approach* and the CSC in this approach as the *(LF) Representational CSC*.

The aim of this chapter is to compare the derivational approach and the representational approach and argue that the latter is superior to the former.[1,2] In this thesis, I adopt a variant of the representational approach where CSC effects are assumed to be derived from the condition in (3) ((3) and (4) are adapted from Fox 2000; for another variant, see Munn 1993).[3]

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[1] I will defer comparison between the LF representational approach and a PF representational approach until Chapter 5.

[2] Discussions on the nature of the CSC are also found in Takahashi 1994 and Progovac 2000.

[3] Fox (2000: 50) proposes accounting for CSC effects on the following assumptions:

(i) a. Extraction out of a coordinate structure is possible only when the structure consists of two [or more] independent substructures, each composed of one of the coordinates together with material above it up the landing site (henceforth, *component structures*).
b. Grammatical constraints are checked independently in each of the component structures.

The main reason for my departure from Fox's analysis is that it is not designed to deal with CSC effects induced by non-movement dependencies. See section 2.2.3 below.

(3) *LF Representational CSC*

A sentence with a coordinate structure is well-formed only if each of its component structures independently satisfies grammatical constraints.

The definition of "component structure" is given below:

(4) *Component structure*

Component structures of a sentence with a coordinate structure $=_{def}$ structures each of which is composed of one of the conjuncts together with the material which is not included by the coordinate structure

The "grammatical constraints" in (3) should be understood to be the ones independently proposed outside the context of coordination, and in this sense, there is no independent "CSC" in this approach.

Let us consider how the unacceptability of example (2) is accounted for under the Representational CSC adopted here. According to (4), the two component structures of this example are like (5a) and (5b) below.

(5) *Component structures of (2)*

a. what did Mary send *t* on Monday

b. what did Mary receive the parcel on Wednesday

Condition (3) requires that each of these structures independently satisfy grammatical constraints. Although (5a) produces no problem with any grammatical constraints, we find a problem in (5b): It violates the ban on vacuous quantification (or Full

Interpretation (Chomsky 1995: 151-152)) since it contains a *wh*-phrase which fails to bind a variable. Hence (2) is ungrammatical.

Note that under the representational approach, the CSC effect in (2) is attributed ultimately to a constraint on LF representations proposed independently of coordination: the ban on vacuous quantification. It is in this sense that "the CSC is an LF representational constraint" under this approach, and thus, precisely speaking, what is called the "Representational CSC" here is the "representational analysis of CSC effects based on condition (3)."[4]

Next, compare (2) with (6), where a *wh*-phrase has been extracted from a coordinate structure in an A(cross)-T(he)-B(oard) fashion.

(6) *ATB* wh-*movement*

What did Mary [send *t* on Monday] and [receive *t* on Wednesday]?

The component structures of this sentence are given below:

(7) *Component structures of (6)*

a. what did Mary send *t* on Monday

b. what did Mary receive *t* on Wednesday

Neither of these structures violates any grammatical constraints. Crucially, unlike (5b), they do not violate the ban on vacuous quantification. Thus, the grammaticality of (6) is correctly predicted under the Representational CSC.

[4] As will be seen later in this chapter, the ban on vacuous quantification is not the only LF representational condition responsible for CSC effects.

2.2 Arguments for the Representational CSC

Potentially, the evidence in favor of the Representational CSC over the Derivational CSC comes from two directions. One type of evidence may come from cases where a non-ATB movement occurs but no CSC effect is observed. The other type of evidence may come from cases where no movement occurs but a CSC effect is observed. In this section I first introduce two pieces of evidence for the Representational CSC given by Ruys (1993)/Fox (2000) and Lin (2001), which are of the first type, and then provide a new piece of evidence from Japanese topicalization and relativization, which is of the second type.

2.2.1 "Non-ATB movement but no CSC effect" case I: QR and covert *wh*-movement

Ruys (1993) observes that QR out of one conjunct in apparent violation of the CSC is sanctioned when a pronoun bound to the quantifier appears in the other conjunct. The following example, which is taken from Fox 2000: 52, illustrates this:

(8) *QR*

a. A (#different) student [likes **every professor**] and [hates the dean].
(**every* > *a*)

b. A (different) student [likes **every professor$_i$**] and [wants **him$_i$** to be on his committee]. (*every* > *a*)

In (8b), the pronoun in the second VP conjunct is co-indexed with the universal quantifier in the first conjunct, while in (8a), this dependency does not hold. The universal quantifier cannot take wide scope over the subject in (8a), but this is possible in (8b).[5] The unavailability of the inverse scope in (8a) shows that QR obeys the CSC (May 1985). However, if the CSC is a condition on movement, as conceived under the derivational approach to this constraint, the availability of the inverse scope in (8b) is unexpected: QR should be blocked in this example, as in (8a).

On the other hand, as argued by Fox (2000), the above contrast is what the Representational CSC predicts. Consider the LF representations of the two component structures of (8a) under the intended interpretation:

(9) *Component structures of (8a)*

a. every professor$_i$ [a student [likes t_i]]

b. every professor$_i$ [a student [hates the dean]]

In (9b), the universal quantifier, which has been raised covertly to a position above the subject, fails to bind a variable, resulting in a violation of the ban on vacuous quantification. Hence, the impossibility of the inverse scope in (8a). Next, consider the component structures of (8b):

---

[5] There is a linear ordering restriction on this paradigm (Kasai 2004, Potts 2002). Observe the following contrast:

(i) a. *A student wants **him$_i$** to be on his committee and likes **every professor$_i$**.
b. A student wants **every professor$_i$** to be on his committee and likes **him$_i$**.

The unacceptability of (ia) cannot be dealt with by the Representational CSC alone. For a possible explanation, see Appendix of this chapter.

(10) *Component structures of (8b)*

a. every professor$_i$ [a student [likes t_i]]

b. every professor$_i$ [a student [wants him$_i$ to be on his committee]]

In each of these structures, there is no violation of the ban on vacuous quantification (and any other grammatical constraints). In particular, unlike in (9b), the QR out of the first conjunct does not create vacuous quantification in (10b), because it binds a bound pronoun there. Thus, the Representational CSC correctly predicts the availability of the inverse scope in (8b).[6]

This account of the contrast in (8) based on the Representational CSC receives support from the observation, which is also made by Ruys, that in-situ *wh*-phrases behave like quantifiers:

(11) *Covert* wh-*movement*

a. *I wonder who [took **what** from Mary] and [gave a book to Fred].[7]

b. I wonder who [took **what$_i$** from Mary] and [gave **it$_i$** to Fred].

(Ruys 1993: 36)

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[6] See also Potts 2002, where it is claimed that the pronoun in the second conjunct in (8b) is not a bound pronoun, but an E-type pronoun. What is important here is that whatever the precise status of the pronoun is, it is the dependency between the covertly moved QP and the pronoun that makes the inverse scope available to the example, and only the Representational CSC can benefit from it.

[7] In-situ echo *wh*-phrases do not exhibit CSC effects, as shown below:

(i) *Echo question*
John [ate an apple this morning] and [drank WHAT last night]??

I tentatively interpret this fact as indicating that in-situ echo *wh*-phrases can be somehow licensed without creating an operator-variable chain (see also Kato 2004). I thank Gennaro Chierchia for discussion on this issue.

The covert movement of *what* results in vacuous quantification in (11a), as the QR of *every professor* in (8a) does, while the corresponding covert movement in (11b) does not lead to such a violation due to the existence of a bound pronoun (*it*), exactly as in (8b).[8]

2.2.2 "Non-ATB movement but no CSC effect" case II: Gapping sentences

Another argument for the Representational CSC is made by Lin (2001), who investigates examples with Gapping like (12).

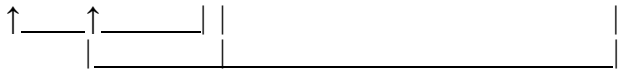
(12) *Gapping*

Bob dusted the bookcase and Mary, the windowsill.

Following Johnson (1996), Lin assumes that the structure of this example is something like (13) below (cf. also Agbayani and Zoerner 2004, Lin 2000).

(13) *Johnson's (1996) analysis of Gapping*

$[_{IP}\ Bob_i\ dusted_j\ [[_{VP}\ t_i\ t_j$ the bookcase] and $[_{VP}$ Mary t_j the windowsill]]]



Here, two VPs are conjoined; the subject of the first VP moves to Spec,IP, while that of the second VP remains in situ; and the verb undergoes ATB head-movement to I^0.

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[8] See Chapter 6 for more discussion on CSC effects with *wh*-in-situ.

For a possible explanation of the unacceptability of examples like (i), see footnote 35 below.

(i) *Who_i did this teacher scold t_i and praise him_i?

A piece of evidence in favor of this structure comes from the following contrast between a Gapping sentence and a non-Gapping sentence (see Agbayani and Zoerner 2004, Johnson 1996, and Lin 2000 for further evidence):

(14) a. Not every girl$_i$ ate a green banana, and her$_i$ mother, a ripe one.

b. *Not every girl$_i$ ate a green banana, and her$_i$ mother ate a ripe one.

The fact that the first subject cannot bind into the second subject in (14b), a non-Gapping sentence, can be explained on the natural assumption that the coordination involved in the sentence is sentential-level, so that the first subject cannot c-command the second subject. If so, however, the possibility of the variable binding in (14a), a Gapping sentence, indicates that the first subject can c-command the second subject in Gapping sentences, which is captured by the structure in (13) above.

It is obvious that the Derivational CSC is violated in (13). This is incompatible with the acceptability of the example.[9] At the same time, however, at first sight, the Representational CSC also appears to be violated in (13). The apparent component structures of the example are as in (15).

(15) *Apparent component structures of (13)*

a. Bob$_i$ dusted$_j$ t_i t_j the bookcase

b. Bob$_i$ dusted$_j$ Mary t_j the windowsill

[9] Johnson (1996) assumes that A-movement is not subject to the CSC (as a condition on movement). See also Johnson 2002.

In (15b), the Theta Criterion (or Full Interpretation (Chomsky 1995: 315)) is violated: Although the verb has only two theta-roles to assign, there are three arguments (i.e. *Bob*, *Mary*, and *the windowsill*).[10]

Lin argues that the moved subject undergoes reconstruction into its base position to avoid a violation of the Theta Criterion. Thus, the LF representation of (12) is as in (16) and the true component structures of this sentence are (17a) and (17b).

(16) $[_{IP}$ dusted$_j$ $[[_{VP}$ Bob t_j the bookcase] and $[_{VP}$ Mary t_j the windowsill]]]
|_____↑

(17) *True component structures of (13)*

a. dusted$_j$ Bob t_j the bookcase

b. dusted$_j$ Mary t_j the windowsill

Here, there is no violation of the Theta Criterion (and any other grammatical constraints). Thus, the Representational CSC correctly predicts the acceptability of (12).

The claim that the first subject in a Gapping sentence is reconstructed into its base position is supported by the contrast seen in (18) below.

(18) a. Bob or Mary can't *t* eat rice. (*or* > NEG)

[10] It should be noted that if theta-roles are formal features, as claimed in Bošković and Takahashi 1998, Hornstein 1998, 2001, Lasnik 1995a, among others, and if every copy of X shares all of X's features, the copy of *Bob* in (15b) should bear a checked theta-feature and satisfy the Theta Criterion in that component structure. I assume (and I guess Lin also implicitly assumes), following Chomsky (1995) and subsequent works, that theta-roles are not features and assigned to arguments in their base positions (see also Hale and Keyser 1993, Jackendoff 1987, 1990). Although this (non-trivial) assumption might need some modification because some researchers claim that arguments may receive a theta-role in non-base positions (see Bošković 1994, among others), I set aside this issue here.

b. Bob or Mary can't *t* eat rice and Jeremy eat potatoes. (NEG > *or*)

(Lin 2001: 367-8)

In (18a), which is a normal sentence without Gapping, the disjunction in the subject must take wide scope over the sentential negation, so that the only reading of the sentence is that either Bob can't eat rice or Mary can't eat rice. In contrast, in (18b), which is a sentence with Gapping, the disjunction in the first subject cannot take wide scope: The only reading available for (18b) is that it can't be the case that Bob eats rice while Jeremy eats potatoes *and* it can't be the case that Mary eats rice while Jeremy eats potatoes. This obligatory narrow scope reading of the first subject indicates that the first subjects of Gapping sentences like (12) must undergo reconstruction, and this is what the Representational CSC predicts.

The claim that the first subject undergoes reconstruction is also supported by the following examples:

(19) a. A single student did not ride the elevator. (*a single* > NEG)

b. ?A single student did not ride the elevator or a single professor climb the stairs. (NEG > *a single*)

(Lin 2001: 367-8)

In (19a), a normal sentence without Gapping, the first subject *a single student* can only take wide scope over negation. Crucially, it cannot be interpreted as taking scope below negation. Thus, (19a) cannot have the reading in which *a single student* is interpreted as an negative polarity item, that is, that no student rode the elevator. In contrast, in (19b), a

sentence with Gapping, *a single student* can only be interpreted as an NPI. That is, the only possible reading of the sentence is that no student rode the elevator and no professor climbed the stairs. Again, this obligatory narrow scope reading of the first subject indicates that it is obligatorily reconstructed.

Now let us reconsider (14a), repeated below:

(20) Not every girl$_i$ ate a green banana, and her$_i$ mother, a ripe one.

In this sentence, the first subject cannot be reconstructed, because it must c-command the bound pronoun. Thus, the LF representations of the component structures of the sentence should be like the following:

(21) *Component structures of (20)*

a. [$_{IP}$ Not every girl$_i$ ate$_j$ [$_{VP}$ t_i t_j a green banana]]

b. [$_{IP}$ Not every girl$_i$ ate$_j$ [$_{VP}$ her$_i$ mother t_j a ripe one]]

Then, how does the subject in (21b) satisfy the Theta Criterion? I assume with Lin (2001) that it satisfies the condition by binding, and forming a chain with, the bound pronoun.

Two points should be noted about Lin's work at this point. First, she shows that not only A'-movement but also A-movement obeys the Representational CSC. Second, she also shows that reconstruction of a moved element may nullify the Representational CSC.[11] This latter point will become important in the next chapter, where we consider an implication of the Representational CSC for an analysis of Japanese scrambling.

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[11] An example like the following appears to pose a problem for the analysis being proposed here, as pointed out to me by Gennaro Chierchia (personal communication):

(i) *John smoked and arrived three men.

2.2.3 "No movement but a CSC effect" case: Japanese topicalization and relativization

In this subsection, I provide another piece of evidence for the Representational CSC, from topic and relative clause constructions in Japanese. These constructions are important for our discussion in two ways. First, they give us the evidence of a different type from the ones we saw in the last two subsections: a case where no movement occurs but a CSC effect is detected.[12] Second, they give us the evidence from a language

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Suppose that in an expletive sentence like (ii) below, the phi-features of I^0 and the Case feature of the associate NP are licensed through Agree in the sense of Chomsky 2000, 2001, and the expletive is inserted into Spec,IP only to check the EPP feature of the head (cf. Chomsky 1995, 2000; see also Hornstein and Witkos 2003 and Sabel 2000 for an analysis where the expletive starts out as a constituent with its associate and then moves to Spec,IP).

(ii) There arrived three men.

Then, how can we rule out the following derivation for (i)?

(iii) $[_{IP}$ I^0 $[_{VP}[_{VP}$ John smoked] and $[_{VP}$ arrived three men]]]
↑ (1) |
| (2) ↑

Here, the subject *John* is base-generated in Spec,VP in the first conjunct, raises to Spec,IP to check the EPP, and undergoes reconstruction back into the base position. Neither of the component structures of the example, whose LF representations are given below, seems to violate any grammatical constraints (e.g., the Theta Criterion):

(iv) *Component structures of (i)*
a. $[_{IP}$ I^0 $[_{VP}$ John smoked]]
b. $[_{IP}$ I^0 $[_{VP}$ arrived three men]]

I take the ungrammaticality of (i) to indicate that *there* does more than just to check the EPP feature in expletive sentences. Here I would like to suggest two possibilities about the relevant function of the expletive. The first possibility is that, as Bošković (2005) claims, an associate NP is assigned partitive Case (Belletti 1988) but this Case can be assigned only in the presence of *there*. If this is the case, we can rule out (i) for a Case-theoretic reason (see also Chomsky 1986, Grohman et al. 2000). The second possibility is that *there* participates in theta-relations in expletive sentences, as an argument (cf. Williams 1994) or as a predicate (cf. Moro 1997). Under this possibility, we can rule out (i) for a theta-theoretic reason (see also Hazout 2004). I leave the choice between the two possibilities for future research.

[12] Another potential case of "no movement but a CSC effect" is suggested in Moltmann 1992. It involves binominal *each*:

different from English. This supports the universality of the LF nature of the CSC. Moreover, because one of the aims of this thesis is to consider an implication of the LF nature of the CSC for Japanese scrambling, it is important to find the evidence for the Representational CSC in that language; otherwise, one could say, for example, that the CSC is an LF condition in English, but not in Japanese.[13]

2.2.3.1 A non-movement nature of topicalization and relativization in Japanese

It has been argued in the literature on Japanese syntax that topic sentences and relative clauses in Japanese, examples of which are given in (22), do not involve movement (Aoun and Li 2003, Hoji 1985, Kuno 1973, Murasugi 1991, 2000a, b, Takeda 1999).

(22) a. *Topic sentence*

Sono hon$_i$-wa [Taroo-ga kinoo e_i katta].

that book-Top T.-Nom yesterday bought

'Speaking of that book, Taroo bought it yesterday.'

(i) *Binominal* each

a. *On two days *each* [[the men played the piano] and [it rains]].

b. On two days *each* [[the men played the piano] and [the women played the violin]].

As long as binominal *each* is licensed without movement, it can give us a true argument for the Representational CSC. See Boeckx and Hornstein 2005 and Safir and Stowell 1988 for a movement approach and Zimmermann 2002 for a non-movement approach.

[13] This is actually what I suggested in an earlier version of Kato 2006. See Chapter 4 for another piece of evidence for the Representational CSC from Japanese, which is of the "non-ATB movement but no CSC effect" type.

b. *Relative clause*

[Taroo-ga kinoo e_i katta] hon$_i$

T.-Nom yesterday bought book

'the book which Taroo bought yesterday'

The evidence that movement need not be involved in those Japanese constructions is found in Kuno 1973. First, he observes that they need not contain a gap ((23b) and (24b) are from Mikami 1960: 84 and Murasugi 1991, respectively):

(23) *Gapless topic sentences*

a. Sakana-wa [tai-ga oisii].[14]

fish-Top red:snapper-Nom is:tasty

'Speaking of fish, red snapper is tasty.'

[14] Because this example has a corresponding multiple nominative sentence, or (i), one might analyze the topic phrase in the example as being derived by moving the corresponding nominative phrase in (i), as shown in (ii) (cf. Kuroda 1986).

(i) Sakana-ga tai-ga oisii.
fish-Nom

(ii) Sakana-wa [$_{IP}$ *t* tai-ga oisii]
↑_____|

If this analysis is plausible, (23a) is not a true example of gapless topic sentences. This possible problem does not arise for (23b), since it does not have a corresponding multiple nominative sentence, as shown below:

(iii) *Are-ga zettai amerika-ga warui.
that-Nom

b. Are-wa [zettai amerika-ga warui].[15]

that-Top absolutely America-Nom is:bad

(Lit.) 'Speaking of that (situation), America is absolutely bad.'

(24) *Gapless relative clauses*

a. [syuusyoku-ga muzukasii] buturigaku[16]

getting:job-Nom is:hard physics

'physics, which is hard to get a job in'

b. [doa-ga simaru] oto

door-Nom shut sound

'the sound of a door shutting'

In (23a) and (23b), the part of the sentence following the topic phrase does not contain any gap position from which the putative movement of the topic phrase (or a null

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[15] The topic in this example is an instance of "situational topic" in Mikami's (1960) sense. See also Tsubomoto 1989.

[16] One might object that the relative clause in this example is not gapless, because the following topic sentence is possible:

(i) Buturigaku-wa syuusyoku-ga muzukasii.
physics-Top getting:job-Nom is:hard
'Speaking of physics, it is hard to get a job in it.'

One might then claim that there is a gap in the topic position of the relative clause in (24a) (cf. Kuno 1973). This possible objection does not apply to (24b), because a topic sentence like the following is impossible:

(ii) *[(Sono) oto-wa] [doa-ga simaru].
that sound-Top door-Nom shut
'Speaking of that sound, a door shuts.'

One might distinguish true gapless modifiers as in (24b) from relative clauses (cf. Kuno 1973), but this possible distinction is immaterial for our present purposes. Here I use the term "relative clause" in the same meaning as "sentential NP modifier." See Hale 1980 and Saito 1985 for (conceptual) arguments against the view that the relative clause in (24a) is not gapless.

operator associated with it) should occur. Likewise, in (24a) and (24b), the relative clause does not contain any gap position from which the putative movement of the relative head (or a null operator associated with it) should occur.

On the basis of this observation, Kuno argues that the only requirement on Japanese topic and relative clause constructions is that an "aboutness relation" should hold between the topic phrase and the rest of the sentence or between the relative head and the relative clause. That is, a topic sentence is well-formed as long as the part of the sentence following the topic phrase can be interpreted as "being about" the topic phrase, and a relative clause is well-formed as long as the relative clause can be interpreted as "being about" the relative head.

Kuno's second observation supporting the non-movement property of Japanese topicalization and relativization is that these processes do not exhibit subjacency effects:[17,18]

(25) *Lack of subjacency effects with topicalization*

a. Sono hito$_i$-wa [$_{adjunct}$ e_i sinda noni] dare-mo kanasimanakatta.
that person-Top died although anyone was:not:saddened
'Speaking of that person, no one was saddened although he died'

[17] As noted by Saito (1985), although PPs, as well as NPs, can be topicalized, only NP-topicalization obviates subjacency violations. On the other hand, Hoji (1985) observes that when *wa*-marked phrases function as contrastive phrases, not topic phrases (cf. Kuno 1973), they exhibit subjacency effects. Hoji argues that Saito's observation is a subcase of his because PP-*wa*-phrases tend to be contrastive.

[18] Hasegawa (1984/5) claims that Japanese (NP-)topicalization and relativization do obey subjacency in some specific cases. However, as pointed out by a number of researchers, her claim is factually incorrect. See Ishii 1991, Kitagawa 1982, Kornfilt, Kuno and Sezer 1980, Mihara 1994, Nakamura 1990, and Saito 1985, among others.

b. Sono sinsi$_i$-wa [$_{RC}$ e_i e_j kiteiru] yoohuku$_j$-ga yogoreteiru.
that gentleman-Top is:wearing suit-Nom is:dirty
'Speaking of that gentleman, the suit he is wearing is dirty.'

(26) *Lack of subjacency effects with relativization*

a. [[$_{adjunct}$ e_i sinda noni] dare-mo kanasimanakatta] hito$_i$
died although anyone was:not:saddened person
'the person who no one was saddened although he died'

b. [[$_{RC}$ e_i e_j kiteiru] yoohuku$_j$-ga yogoreteiru] sinsi$_i$
is:wearing suit-Nom is:dirty gentleman
'the gentleman who the suit that he is wearing is dirty'

In (25a) and (25b), the topic phrase is associated with a position in the adjunct and the complex NP (or relative clause), respectively, but these examples are acceptable. Likewise, (26a) and (26b) show that a relative head can be associated with a position in an adjunct and a complex NP, respectively.

As argued by Perlmutter (1972), the absence of subjacency effects in Japanese topicalizaiton and relativization can be attributed to the fact that Japanese is a *pro*-drop language: Because a phonologically null pronoun, or *pro*, can appear in any argument position in this language, a gap appearing in a topic sentence or relative clause can be such a pronoun, and, crucially, it need not be a trace left by movement.

Further support for the non-movement property of Japanese topicalization and relativization comes from Takeda's (1999) observation that Japanese permits conjoined

NPs in the topic and relative head positions to be associated with separate gaps, as shown below:

(27) a. *Topic phrase associated with multiple gaps*

[sono isu_i-to hon_j]-wa [Mary-ga [*pro* e_i kosikakete] e_j yondeita
that chair-and book-Top M.-Nom sitting was:reading
kadooka] John-ga siritagatta.
whether J.-Nom wanted:to:know
(Lit.) 'That chair and that book, John wanted to know whether Mary was reading it, sitting on it.' (Takeda 1999: 171)

b. *Relative head associated with multiple gaps*

[Mary-ga kono nikagetu-de e_i e_j okutta] [$ronbun_j$-to $syuppansya_i$]-o
M.-Nom this two:month-for sent article-and publisher-Acc
osiete kudasai.
tell please
'Please tell me about the articles and publishers such that Mary sent them to those places for the past two months.' (ibid.: 171)

These constructions are impossible in languages like English (e.g., ***Please tell me about the articles$_i$ and publishers$_j$ that Mary sent*** e_j e_i ***for the past two months*** (Takeda 1999: 134)). If this impossibility is attributed to the fact that movement is necessarily involved in relativization and topicalization in those languages, the above examples indicate that movement is not necessary in the derivation of Japanese topic and relative clause constructions (see Takeda 1999).

So far we have seen pieces of evidence that movement *need not* be involved in Japanese topicalization or relativization. We can go on to make an even stronger claim, namely, that those processes *can not* involve movement. First, consider the English examples in (28) below.

(28) a. the picture of himself$_i$ that John$_i$ likes best

b. That picture of himself$_i$, John$_i$ liked.

c. *That picture of himself$_i$, John$_i$ liked it.

The possibility of coreference between *himself* and *John* in (28a) can be explained by assuming that the relative head containing *himself* has been moved from the object position in the relative clause and can be reconstructed to this position at LF. Similarly, the coreference in (28b) can be explained by assuming that the topic phrase has been moved from the object position and can undergo LF reconstruction to this position. This much said, the impossibility of the coreference in (28c) may be taken to indicate that the left dislocated phrase is base-generated in the surface position, so that it cannot undergo reconstruction to a position where the binding requirement is satisfied.[19]

As Hoji (1985) notes, Japanese topic sentences fail to exhibit reconstruction effects of this kind. Witness the following examples:[20]

[19] See Adger and Ramchand 2005 and Aoun and Li 2003, where it is argued that absence of reconstruction effects is a diagnosis for the absence of movement under the copy theory of movement. But see also Boeckx and Hornstein, to appear.

[20] When *wa*-phrases function as contrastive phrases, rather than topic phrases, they exhibit reconstruction effects (Hoji 1985). See footnote 17.

Lack of reconstruction effects with topicalization

(29) a. John$_i$-ga[sono zibun$_i$ nituite-no hon]-o suteta.
J.-Nom that sefl about-Gen book-Acc threw:away
'John$_i$ threw away the book about himself$_i$.'

b. *[Sono zibun$_i$ nituite-no hon]$_j$-wa John$_i$-ga e_j suteta.
that self about-Gen book-Top J.-Nom threw:away
'Speaking of the book about himself$_i$, John$_i$ threw it away.'

(30) a. John$_i$-ga[[Mary-ga zibun$_i$-ni kureta] hon]-o suteta.
J.-Nom M.-Nom self-to gave book-Acc threw:away
'John$_i$ threw away the book that Mary gave him$_i$.'

b. *[[Mary-ga zibun$_i$-ni kureta] hon]$_j$-wa John$_i$-ga e_j suteta.
M.-Nom self-to gave book-Top J.-Nom threw:away
'Speaking of the book that Mary gave him$_i$, John$_i$ threw it away.'

In the *b* examples, coreference between an "anaphor-like" element *zibun* in the topic phrase and the subject *John* is impossible. This can be explained on the assumption that Japanese topicalization *cannot* involve movement of the topic phrase. The same claim can be made for relative clauses. The following example is cited from Murasugi 2000a, b:

(31) *Lack of reconstruction effects with relativization*
*[John$_i$-ga e_j taipu-sita] zibun$_i$-no ronbun$_j$
J.-Nom typed self-Gen paper
'the paper of himself$_i$ that John$_i$ typed'

Unlike in English example (28a), here *zibun* in the relative head cannot be coreferential with the subject of the relative clause.[21] Compare (29b), (30b) and (31) with (32) below, which shows that scrambling, which has been analyzed as a movement operation, displays reconstruction effects (Kuno 1973, Muraki 1974; the examples are from Hoji 1985).

(32) *Reconstruction effects with scrambling*

a. [Sono zibun$_i$ nituite-no hon]$_j$-o John$_i$-ga t_j suteta.
that self about-Gen book-Acc J.-Nom threw:away
'The book about himself$_i$, John$_i$ threw away.'

b. [[Mary-ga zibun$_i$-ni kureta] hon]$_j$-o John$_i$-ga t_j suteta.
M.-Nom self-to gave book-Acc J.-Nom threw:away
'The book that Mary gave him$_i$, John$_i$ threw away.'

As for relativization, Murasugi (2000a, b) makes yet another argument for the unavailability of movement. Her argument is based on the observation by Saito (1985) that relativization of reason and manner adjuncts is clause-bound in Japanese, which is illustrated by the following examples:

[21] See Aoun and Li 2003: 197-8 for examples involving bound pronouns and scope interaction, which also show the lack of reconstruction in Japanese relativization. Similar examples can be constructed for topicalization, too.

Clause-boundedness of adjunct relativization

(33) a. [Mary-ga e_i kaetta] riyuu$_i$

M.-Nom left reason

'the reason that Mary left'

b. *[Mary-ga [John-ga e_i kaetta to] omotteiru] riyuu$_i$

M.-Nom J.-Nom left C think reason

'the reason that Mary think that John left'

(34) a. [Mary-ga e_i mondai-o toita] hoohoo$_i$

M.-Nom problem-Acc solved method

'the method by which Mary solved the problem'

b. *[Mary-ga [John-ga e_i mondai-o toita to] omotteiru] hoohoo$_i$

M.-Nom J.-Nom problem-Acc solved C think method

'the method by which Mary thinks that John solved the problem'

(33b) and (34b) are unacceptable under the reading in which the relative head is associated with the embedded clause. This can be explained by assuming (i) that a *pro* can appear only in argument positions, and (ii) that no movement can be involved in Japanese relativization.[22] If the derivation of those examples can involve movement, they should be acceptable under the intended reading on a par with their English translations.[23]

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[22] This means that the relative clauses in (33) and (34) are gapless. Murasugi (1991) argues that they should be treated in the same way as "true gapless relative clauses" as in (24b). See footnote 16.

[23] It is not possible to apply the same line of argument to topicalization, because reason and manner adjuncts cannot be topicalized in the first place:

To sum up the discussion in this subsection, we have good reasons to believe that Japanese topicalization and relativization not only need not, but also can not involve movement. The only licensing condition on Japanese topic and relative clause constructions is an "aboutness" relation between the topic phrase and the rest of the sentence or between the relative head and the relative clause. A gap in those constructions is, if any, a *pro*, not a trace left by movement.

2.2.3.2 Evidence for the Representational CSC

Now let us return to the issue of the Derivational CSC vs. the Representational CSC and see whether Japanese topicalization and relativization exhibit CSC effects.

Consider the following examples (cf. Tamori 1976/7):[24,25]

(i) a. *Sono riyuu-wa [Taroo-ga Hanako-o ketta].
that reason-Top T.-Nom H.-Acc kicked
'Speaking of that reason, Taroo kicked Hanako.'
b. *Sono hoohoo-wa [Taroo-ga kuruma-o naosita].
that method-Top T.-Nom car-Acc fixed
'Speaking of that method, Taroo fixed a car.'

If the preposition *de* 'for' is attached to the adjuncts, the examples will become grammatical, but such PP-topicalization is known to have a movement property and, as such, is not our concern here. See footnote 17.

[24] Tamori does not distinguish NP-topicalization and PP-topicalization in his discussion and most of the topicalization examples he investigates are of the latter. See footnotes 17 and 23.

[25] Recall that in Japanese VP coordination, an overt conjunction need not appear (see section 1.4 of Chapter 1). In the examples which follow, "&" stands for an invisible conjunction.

(35) *CSC effects with topicalization*

a. *Taroo$_i$-wa [Yamada kyoozyu-ga[*pro*$_i$ home]&[Hanako-o sikatta]].[26]

T.-Top Y. prof.-Nom praise H.-Acc scolded

'Speaking of Taroo, Prof. Yamada praised him and scolded Hanako.'

b. *Hanako$_i$-wa [Yamada kyoozyu-ga[Taroo-o home]&[*pro*$_i$ sikatta]].

H.-Top Y. prof.-Nom T.-Acc praise scolded

'Speaking of Hanako, Prof. Yamada praised Taroo and scolded her.'

c. Taroo-wa[Yamada kyoozyu-ga[kyoo *pro*$_i$ home]&[kinoo *pro*$_i$ sikatta]].

T.-Top Y. prof.-Nom today praise yesterday scolded

'Speaking of Taroo, Prof. Yamada praised him today and scolded him yesterday.'

In (35a), the topic phrase is associated with the *pro* in the first VP conjunct, and the example is unacceptable. Similarly (35b), where the topic phrase is associated with the *pro* in the second conjunct, is unacceptable. (35c) indicates that when each of the two conjuncts contains a *pro* and the two *pro*'s are associated with the topic phrase, the example is grammatical.

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[26] In Chapter 7, I argue that subject raising to Spec,IP is not obligatory in Japanese. The ungrammaticality of (35a) shows that the following structure is not available in spite of the possibility of the subject remaining in Sepc,VP:

(i) [$_{IP}$[$_{VP}$ Taroo$_i$-Top Prof. Yamada$_j$-Nom *pro*$_i$ praise]&[$_{VP}$ *pro*$_j$ Hanako-Acc scolded] I^0].

It seems that this is due to the impossibility of the *pro* subject in the second conjunct referring to Prof. Yamada in the presence of the topic phrase *Taroo* (cf. Huang 1984). The appearance of a topic phrase within VP itself gives rise to no problem, as seen in example (40c) below (see also Chapter 7).

What we see here is nothing but the CSC effects.[27] However, as we discussed in the preceding subsection, Japanese topicalization does not involve movement. Therefore, the CSC effects in (35a) and (35b) cannot be attributed to the Derivational CSC, which bans a non-ATB movement out of a conjunct. In contrast, the Representational CSC, which requires that each of the component structures of a given sentence should be well-formed independently, can explain the unacceptability of the examples in question. Consider the component structures of (35a), given below:[28]

(36) *Component structures of (35a)*

a. Taroo$_i$-wa [Yamada kyoozyu-ga [*pro*$_i$ home] -ta]

T.-Top Y. prof.-Nom praise Past

'Speaking of Taroo, Prof. Yamada praised him.'

b. Taroo$_i$-wa [Yamada kyoozyu-ga [Hanako-o sikat] -ta]

T.-Top Y. prof.-Nom H.-Acc scold Past

'Speaking of Taroo, Prof. Yamada scolded Hanako.'

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[27] As seen in section 1.3.3 of Chapter 1, the CSC effects of movement can be obviated when the conjuncts are linked by an asymmetrical semantic relation (one of the relevant examples is repeated in (i) below). Similar effects are observed with the CSC effects of aboutness relations, as shown in (ii) (cf. Tokashiki 1989).

(i) the stuff which Arthur sneaked in and stole *t* (Postal 1998: 53)

(ii) Kono biiru-wa$_i$ [Taroo-ga [sono mise-e iki]&[*pro*$_i$ katta]]
this beer-Top T.-Nom that shop-to go bought
'Speaking of this beer, Taroo went to that shop and bought it.'

This similarity between the two types of CSC effects gives us further grounds for believing that they are the same phenomenon and as such should be explained by a single constraint.

[28] The tense morpheme stays in I^0 in (36a) and (36b), because these are representations at LF and affix-hopping is a PF operation (see section 1.4 of Chapter 1).

As the English translation shows, an aboutness relation does not hold between the topic phrase *Taroo-wa* and the rest of the example in (36b). Thus, the Representational CSC is violated.

Because the data in (35) can be dealt with under the Representational CSC, but cannot be under the Derivational CSC, it follows that the former is superior.

The same line of argument can also be made based on relativization. Examples in point are the following (cf. Tamori 1976/7, Tokashiki 1989):

(37) *CSC effects with relativization*

a. *[Yamada kyoozyu-ga [*pro*$_i$ home]&[Hanako-o sikatta]] gakusei$_i$

Y. prof.-Nom praise H.-Acc scolded student

'the student who Prof. Yamada praised and scolded Hanako'

b. *[Yamada kyoozyu-ga [Taroo-o home]&[*pro*$_i$ sikatta]] gakusei$_i$

Y. prof.-Nom T.-Acc praise scolded student

'the student who Prof. Yamada praised Taroo and scolded'

c. [Yamada kyoozyu-ga [kyoo *pro*$_i$ home]&[kinoo *pro*$_i$ sikatta]] gakusei$_i$

Y. prof.-Nom today praise yesterday scolded student

'the student who Prof. Yamada praised today and scolded yesterday'

In (37a) and (37b), the relative head is associated with the *pro* appearing in only one of the VP conjuncts, and the examples are unacceptable. In the grammatical example in (37c), the relative head is associated with the two *pro*'s in the two conjuncts. Again, the unacceptability of the first two examples cannot be accounted for by the Derivational CSC, simply because movement is not involved in Japanese relativization. By contrast, it

can be successfully explained by the Representational CSC, since one of the two component structures of the examples violates the aboutness condition. For example, one of the component structures of (37a) is as in (38).

(38) *One of the component structures of (37a)*

[Yamada kyoozyu-ga [Hanako-o sikat] -ta] gakusei$_i$

Y. prof.-Nom H.-Acc scold Past student

'the student who Prof. Yamada scolded Hanako'

Here, no aboutness relation holds between the relative head and the relative clause.

So far I have argued that the CSC should be regarded as a condition on LF representations rather than as a condition on movement, because CSC effects can be detected even when movement does not occur. In the remainder of this subsection, I would like to defend my argument from a possible objection, which was suggested to me by Cedric Boeckx and James Huang (personal communications) independently.

First of all, it should be noticed that all the examples I used above to demonstrate CSC effects in topic sentences and relative clauses contain a *pro*. A conceivable objection to my argument then is that it might be the case that movement is involved in licensing of *pro*. For the sake of concreteness, I will consider the following possibility, which I owe to Boeckx:

(39) *Pro* is a residue of movement and functions as a resumptive pronoun which remedies island violations except for the CSC.[29]

[29] See Boeckx 2003b for the argument that resumptive pronouns are derivational residues.

If this is correct, movement is always involved in gapped relative clauses and topic sentences, so that the CSC effects found in those gapped constructions are compatible with the Derivational CSC. Moreover, the observation seen in the preceding subsection that those constructions are insensitive to islands except the CSC island, such as the complex NP island and the adjunct island, can also be explained under (39) (see (25) and (26)).

This possible objection should not go unheeded, because it is actually reported that such a system of resumptive pronouns as suggested in (39) exists, that is, a resumptive system under which resumptive pronouns can remedy island violations except for the CSC. For example, according to Georgopoulos (1991), Palauan has such a resumptive system.

However, analyzing the CSC effects found in gapped topic sentences and relative clauses in Japanese in the light of (39) poses a problem. If we assume that movement is involved in those constructions, it should be predicted that reconstruction is available to them (cf. Adger and Ramchand 2005, Aoun and Li 2003; cf. also Boeckx and Hornstein, to appear). As seen in the preceding subsection, this is not the case (see (29)-(31)).[30]

In what follows, I will set aside this problem and strengthen my argument by providing further data which are not subject to the objection just discussed. I will show that topic sentences and relative clauses which do not involve a *pro* (or a gap) can also exhibit CSC effects.

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[30] See Aoun and Benmamoun 1998 and Aoun, Choueiri and Hornstein 2001, where it is argued that when a resumptive pronoun and its antecedent are not separated by an island, the antecedent can be reconstructed, while otherwise it cannot.

First, consider the following examples of gapless topic sentences:[31,32]

(40) *Gapless topic sentences*

a. *Sakana-wa [[tai-ga oisiku]&[retasu-ga mazui]].
fish-Top red:snapper-Nom tasty lettuce-Nom is:nasty
'Speaking of fish, red-snapper is tasty and lettuce is nasty.'

b. Sakana-wa [[tai-ga oisiku]&[tara-ga mazui]].
fish-Top red:snapper-Nom tasty cod-Nom is:nasty
'Speaking of fish, red-snapper is tasty and cod is nasty.'

c. [Sakana-wa tai-ga oisiku]&[yasai-wa retasu-ga mazui].
fish-Top red:snapper-Nom tasty vegetable-Top lettuce-Nom is:nasty
'As for fish, red-snapper is tasty and as for vegetables, lettuce is nasty.'

In (40a), the topic phrase is associated with only the first conjunct, and the example is unacceptable. On the other hand, in (40b) the topic phrase is associated with both of the conjuncts and in (40c) each of the conjuncts has its own topic, and these examples are acceptable. Thus, the unacceptability of (40a) should be analyzed as being due to the CSC. Crucially, however, in the above examples there is no gap corresponding to the topic phrase and, accordingly, we cannot assume any movement (even movement leaving an alleged resumptive pronoun). It follows that it is impossible to attribute the

[31] In what follows, I illustrate the CSC effect only with one of the conjuncts for each relevant paradigm, but, unless otherwise stated, the same effect can be detected with the other conjunct.

[32] In the examples in (40), the predicates are not verbs, but adjectives. Just as only the verb in the second conjunct is inflected for tense in the examples with coordination we have seen so far, so only the adjective in the second conjunct is inflected for tense in (40).

unacceptability of (40a) to the Derivational CSC. In contrast, it can be taken care of under the Representational CSC since one of the component structures of the example is like the following, where it is impossible to establish an aboutness relation between the topic and the rest:

(41) *One of the component structures of (40a)*

Sakana-wa [retasu-ga mazui]

fish-Top lettuce-Nom is:nasty

'Speaking of fish, lettuce is nasty.'

Thus, the Representational CSC is superior to the Derivational CSC.

The following example, an instance of the situational topic construction, makes the same point (see footnote 15):

(42) *Situational topic*

Are-wa zettaini [[Taroo-ga siken-ni oti]&[Hanako-ga sensei-ni

that-Top absolutely T.-Nom exam-Dat fail H.-Nom teacher-by

sikarareta]].

was:scolded

(Lit.) 'Speaking of that (situation), absolutely Taroo failed the exam and Hanako was scolded by her teacher.'

This sentence is acceptable in a situation where Taroo and Hanako are present and look depressed, but unacceptable in a situation where only Taroo (or Hanako) is present and looks depressed.

Gapless relatives behave in the same way as gapless topic sentences:

Gapless relative clauses

(43) a. *[Taroo-ga [syuusyoku-ga muzukasii to ii]&[Yamada kyoozyu-no
T.-Nom getting:job-Nom is:hard C say Y. prof.-Gen
kagaku-no zyugyoo-ga tumaranai to omotta]] buturigaku
chemistry-Gen class-Nom is:boring C thought physics
'physics, which Taroo said is hard to get a job in and thought Prof. Yamada's class of chemistry is boring'

b. [Taroo-ga[syuusyoku-ga muzukasii to ii]&[sotugyoo-ga yasasii to
T.-Nom getting-job-Nom is:hard C say graduation-Nom is:easy C
omotta]] buturigaku
thought physics
'physics, which Taroo said is hard to get a job in and thought is easy to graduate in.'

(44) a. *[Taroo-ga [hon-o yaburi]&[enpitu-o kau]] oto
T.-Nom book-Acc break pencil-Acc buy sound
'the sound of Taroo breaking a book and buying a pencil'

b. [Taroo-ga [hon-o yaburi]&[enpitu-o oru]] oto
T.-Nom book-Acc break pencil-Acc break sound
'the sound of Taroo breaking a book and breaking a pencil'

In the *a* examples, which are unacceptable, the relative head is associated with only the first conjunct, while in the *b* examples, which are acceptable, it is associated with both of the two conjuncts. Again, although these gapless examples cannot be analyzed as involving any movement (even movement leaving an alleged resumptive pronoun), they display CSC effects. The Representational CSC, but not the Derivational CSC, can explain this.

Adjunct relative clauses, which cannot be analyzed as containing a gap, namely a *pro* (since this pronoun can appear only in argument positions), reinforce my argument:

(45) *Adjunct relative clauses*

a. *[Taroo-ga [kyoo namaikida-kara sikar-are]&[kinoo homer-are-ta]]
T.-Nom today rude-because scold-Pass yesterday praise-Pass-Past
riyuu
reason
'the reason why Taroo was scolded today because he was rude and praised yesterday'

b. [Taroo-ga [kyoo sikar-are]&[kinoo homer-are-ta]] riyuu
T.-Nom today scold-Pass yesterday praise-Pass-Past reason
'the reason why Taroo was scolded today and praised yesterday'

To sum up the discussion in this subsection, Japanese topic sentences and relative clauses provide the evidence that CSC effects can be detected even in cases where no movement occurs, and this state of affairs can be handled if we regard the CSC as a condition on LF representations, but not if we regard it as a condition on movement.

2.3 Summary

In this chapter, I have compared the derivational approach and the representational approach to the CSC, arguing that the latter is empirically superior. The assumptions which the Representational CSC is based on are repeated below:

(46) *LF Representational CSC*

a. A sentence with a coordinate structure is well-formed only if each of its component structures independently satisfies grammatical constraints.

b. Component structures of a sentence with a coordinate structure $=_{def}$ structures each of which is composed of one of the conjuncts together with the material which is not included by the coordinate structure.

We have discussed two types of supporting evidence for the Representational CSC: The first type, which comes from covert quantificational movement (QR and *wh*-movement) and Gapping sentences, shows that in certain cases, a non-ATB movement can occur without inducing CSC effects; the second type, which is provided by Japanese topicalization and relativization, indicates that in certain cases, a CSC effect can appear even when no movement occurs.

As I stated in the beginning of this chapter, under the representational approach to the CSC, there is no such thing as the "CSC," and CSC effects are derived from conditions independently proposed outside the context of coordination. In this chapter, we have seen three conditions to which the effects are attributed: the ban on vacuous quantification, the Theta Criterion, and the aboutness condition.

Appendix: Linear Ordering Restriction on Ruys' (1993) Paradigms

In section 2.2.1, we discussed Ruys' (1993) observation that QR/covert *wh*-movement out of one conjunct in apparent violation of the CSC is sanctioned when a pronoun bound to the quantifier/*wh*-phrase appears in the other conjunct. The relevant examples involving QR are repeated below:

(47) a. A (#different) student [likes **every professor**] and [hates the dean].
(**every* > *a*)

b. A (different) student [likes **every professor$_i$**] and [wants **him$_i$** to be on his committee]. (*every* > *a*)

In (47b), where the second conjunct contains a pronoun co-indexed with the universal quantifier in the first conjunct, the inverse scope reading is possible, while in (47a), where such a bound pronoun does not appear, it is not.

As noted in footnote 5, there is a linear ordering restriction on Ruys' paradigms (Kasai 2004, Potts 2002; see also Munn 1993: section 3.1), and the following example, where, unlike in (47b), the bound pronoun appears in the first conjunct, is unacceptable under the intended interpretation:

(48) *A student [wants **him$_i$** to be on his committee] and [likes **every professor$_i$**].

Because (47b) and (48) have the same component structures, the contrast between them cannot be derived from the Representational CSC alone. Kasai (2004) suggests, assuming Chomsky's (1976) Leftness Condition ("A variable cannot be the antecedent of a

pronoun to its left"), that (48) should be ruled out as a case of weak crossover. Below I would like to suggest an alternative line of analysis.

My idea is that the ordering restriction can be explained by adopting two proposals recently presented. The first proposal is to view a bound pronoun as a residue of movement (Hornstein 2001; cf. also Boeckx 2003b).[33] As Maria Luisa Zubizarreta (personal communication) pointed out, if we adopt this proposal, what happens in (47b) can be considered to be an ATB QR, and the grammaticality of this example can be reduced to the well-known fact that ATB movement is not subject to the CSC.

The second proposal is the sideward movement approach to ATB movement (Hornstein and Nunes 2002, Nunes 2001, 2004). Roughly put, although ATB movement is normally assumed to proceed as in (49), it proceeds as in (50) under the sideward movement approach.

(49) *Traditional analysis of ATB movement*

XP … [… *t* …]&[… *t* …]
↑_____| |
↑_____|

(50) *Sideward movement analysis of ATB movement*

XP … [… *t* …]&[… *t* …]
↑_____|↑_____|

[33] Precisely speaking, Hornstein (2001) assumes that a bound pronoun is a pronoun which is inserted by the computational system into the position of a copy left by movement of a quantifier. In what follows I simply regard a bound pronoun as a pronounced copy of a quantifier, but this is just for ease of exposition.

Under the standard view, the XP is moved both from the first conjunct and from the second conjunct. On the other hand, under the sideward movement approach, it first moves from the second conjunct into the first conjunct, and then moves to the final landing site.[34] Notice that the sideward movement approach to ATB movement works only if we accept the representational view of the CSC. This is because in the derivation depicted in (50), the second step should violate the Derivational CSC and this is incompatible with the acceptability of ATB movement. Thus, to the extent that the sideward movement approach succeeds, it lends support to the Representational CSC.

Given the above two proposals, the QR in (47b) and (48) should proceed as follows:

(51) QP … [… QP …]&[… QP …]
↑_____|↑_____|

Suppose now that we can somehow ensure in the "bound pronouns as derivational residues" theory that copies which can be realized as bound pronouns are ones in the "tails" (or first merged positions) of chains. Then, the copy which will be realized as a bound pronoun in (51) must be the one in the second conjunct. Therefore, (47b) can be derived, but (48) cannot.[35]

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[34] For the reason why the derivation cannot proceed as follows, see section 6.3.2 of Chapter 6:

(i) XP … [… *t* …]&[… *t* …]
↑ |_____↑|
|_____|

[35] Essentially following suggestions made by Alan Munn (class lectures, Harvard University, 2004) and Akira Watanabe (personal communication), I tentatively assume that examples like the following are ruled out by some version of Chomsky's (1981) Avoid Pronoun Principle:

(i) *Who$_i$ did this teacher scold t_i and praise him$_i$?

In this appendix, I have suggested a promising line of analysis of the linear ordering restriction on Ruys' paradigms. It is worth noting that, if this analysis is correct, Ruys' paradigms themselves are no longer the evidence for the Representational CSC. This is because, as mentioned above, if a bound pronoun is a residue of movement, what the paradigms indicate can be considered to be the well-known exceptionality of ATB movement to the CSC. However, because my analysis of the ordering restriction on the paradigms crucially relies on the sideward movement approach to ATB movement, to the extent that it succeeds, it lends support to this approach to ATB movement.[36] And, in turn, as also mentioned above, to the extent that the latter approach succeeds, it lends support to the Representational CSC, since it works only under this view of the CSC. Thus, it can be said that the analysis suggested here destroys one argument for the Representational CSC, while creating another.

If the bound pronoun is a phonologically realized copy of the *wh*-phrase, then we have an option not to realize the copy, producing a well-formed *Who*$_i$ *did this teacher scold* t$_i$ *and praise* t$_i$*?*. If pronouncing a copy is costlier than not pronouncing it, the existence of this option will block (i).

[36] See section 6.3.2 of Chapter 6 for another argument for the sideward movement approach.

Chapter 3
The Total Reconstruction Property of Japanese Scrambling

I hope to have established the plausibility of the LF representational approach to the CSC in the last chapter by providing several pieces of evidence in favor of it over the derivational approach. In this chapter, I discuss one important theoretical implication of the LF nature of the CSC for Japanese syntax. Specifically, I will argue below that the sensitivity of Japanese scrambling to the CSC, in conjunction with the LF nature of this constraint, leads us to overthrow the widely believed hypothesis that Japanese scrambling can be undone.

3.1 Reconstruction of Scrambled Phrases in Japanese

3.1.1 Saito's (1989) argument for total reconstruction

Since Saito 1989, it has been widely believed among linguists working on Japanese syntax that Japanese scrambling is semantically vacuous and, as such, can be freely "undone" at LF, or Japanese scrambled phrases can be totally, or radically, reconstructed (cf., e.g., Saito 1989, 1994, Tada 1993).

Saito's original examples to illustrate this total reconstruction property of scrambling are like the following (see also Saito 2004):

(1) *Total reconstruction of a scrambled phrase (cf. Saito 1989)*

a. Taroo-ga [Hanako-ga **dono hon**-o katta **ka**] siritagatteiru.
T.-Nom H.-Nom **which book**-Acc bought **Q** want:to:know
'Taroo wants to know [Q which book Hanako bought].'

b. ***Dare**-ga [Hanako-ga sono hon-o katta **ka**] siritagatteiru.
who-Nom H.-Nom the book-Acc bought **Q** want:to:know
'Who wants to know [Q Hanako bought the book].'

c. ?**Dono hon**-o_i Taroo-ga [Hanako-ga t_i katta **ka**] siritagatteiru.
which book-Acc T.-Nom H.-Nom bought **Q** want:to:know
'Which book, Taroo wants to know [Q Hanako bought].'

In these examples, the embedded clause is marked by the question particle *ka*. In (1a), the embedded object is a *wh*-phrase, while in (1b), the matrix subject is a *wh*-phrase. The contrast in grammaticality between these examples shows that *wh*-phrases must be contained in Q-marked clauses (Harada 1972). Moreover, Saito (1989) argues based on the unacceptability of (1b) that the Proper Binding Condition (PBC) is operative in Japanese:

(2) *Proper Binding Condition (PBC)*

Traces must be properly bound. (Fiengo 1977, May 1977)

Otherwise, LF lowering of the matrix subject *wh*-phrase into the embedded clause would create a representation like (3), where the *wh*-phrase is contained in a Q-marked clause, and save the example.

(3) t_i [**dare**-ga$_i$ Hanako-ga sono hon-o katta **ka**] siritagatteiru.
|____↑

Now, in (1c), the embedded object *wh*-phrase has been scrambled to the sentence-initial position. As a result, the *wh*-phrase is not contained in a Q-marked clause at the surface, but the example does not exhibit the grammatical status of PBC violations and is much more acceptable than (1b). Saito (1989) argues that the acceptability of this example shows that the scrambled *wh*-phrase can be reconstructed back into the Q-marked clause in the LF component. However, *if reconstruction is a lowering operation*, the reconstruction of the scrambled phrase must not leave a trace in the scrambled position, since otherwise, the PBC should be violated. Thus, the grammaticality status of (1c) indicates that scrambled phrases can be reconstructed without leaving anything behind, or reconstructed totally (or radically).[1] Saito claims that Japanese scrambling can undergo total reconstruction, or can be undone, because it is a "semantically vacuous operation" in the sense that it does not create an operator-variable chain.[2]

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[1] Naoki Fukui (personal communication) pointed out to me that if Saito is right, the grammatical status of (1c) should be on a par with that of (i) below, which seems to be the case.

(i) (?)Sono hon-o$_i$ Taroo-ga [Hanako-ga t_i katta ka] siritagatteiru.
the book-Acc T.-Nom H.-Nom bought Q want:to:know
'The book, Taroo wants to know if Hanako bought.'

[2] Saito claims that "anaphor binding reconstruction effects," illustrated by the example in (i) below, are cases of Barss' (1986) "chain-binding" as defined in (ii), not cases of reconstruction.

(i) [That picture of himself$_i$]$_j$, John$_i$ liked t_j.

3.1.2 Obligatoriness of reconstruction with long-distance scrambling

Subsequently, a number of researchers have argued that in the case of clause-internal scrambling, the total reconstruction of a scrambled phrase is optional, while in the case of long-distance scrambling out of finite clauses, it is obligatory (see Saito 1989, 1994, Tada 1993, among others).[3]

One set of data showing this is the following (cf. Hoji 2003, Ueyama 1998):

(4) *Clause-internal scrambling of the antecedent of a bound pronoun*

a. **Toyota-sae$_i$**-ga [**so-ko$_i$**-no kogaisya]-o suisensita.
T.-even-Nom **that-place**-Gen child:company-Acc recommended
'Even Toyota recommended its subsidiary.' (Ueyama 1998: 128)

b. ?*[**So-ko$_i$**-no oyagaisya]-ga **A-sya-ni-sae$_i$** Toyota-o
that-place-Gen parent:company-Nom **A-company-Dat**-even T.-Acc
suisensita.
recommended.
'Its parent company recommended Toyota to even Company A.' (ibid.: 130)

(ii) *Chain-binding*
X chain-binds Y iff X and Y are coindexed, and
a. X c-commands Y, or
b. X c-commands a trace of Z, where Z = Y or Z contains Y.

See Miyagawa 2005a for an argument against relying on chain-binding to account for examples like this. At any rate, nothing in our discussion below hinges on how they are explained.

[3] However, in the literature data are found which seem problematic for this generalization, namely, that clause-internal scrambling can, and long-distance scrambling must, undergo reconstruction. See Abe 1993, Boeckx 2003a, Dejima 1999, Johnston and Park 2001 (for Korean), Kuno 1995, McGinnis 1998, Miyagawa 1997, 2005a, Nishigauchi 2002, Saito 1985, 1987, Tada 1993, Takano 2002, Tanaka 2003, and Yatsushiro 1996 (quoted in Richards 2001 and Sauerland and Elbourne 2002).

c. **A-sya-ni-sae$_i$** [**so-ko$_i$**-no oyagaisya]-ga t_i Toyota-o
A-company-Dat-even **that-place**-Gen parent:company-Nom T.-Acc
suisensita.
recommended
'Its parent company recommended Toyota to even Company A.' (ibid.: 133)

The contrast between (4a) and (4b) shows that in order for *so-ko* 'that-place' to be interpreted as a bound pronoun, it must be c-commanded by a co-indexed nominal. In (4c), the object, which is co-indexed with the bound pronoun in the subject, is scrambled to the clause-initial position, and the example is acceptable. This shows that clause-internal scrambling can create a new binding relation. In contrast, long-distance scrambling out of a finite clause fails to behave this way. Thus, in (5b) below, the long-distance scrambled embedded object cannot be the antecedent of the bound pronoun in the matrix subject.

(5) *Long-distance scrambling of the antecedent of a bound pronoun*

a. ?*[**So-ko$_i$**-no bengosi]-ga [John-ga **Toyota-ni-sae$_i$** ayamatta to]
that-place-Gen attorney-Nom J.-Nom **T.-Dat-even** apologized C
omotteiru.
think
'Its attorney thinks that John apologized to even Toyota.'

b. ?***Toyota-ni-sae**$_i$ [**so-ko**$_i$-no bengosi]-ga [John-ga t_i ayamatta to]
T.-Dat-even **that-place**-Gen attorney-Nom J.-Nom apologized C
omotteiru.
think
'Its attorney thinks that John apologized to even Toyota.'

(Ueyama 1998: 134)

This state of affairs can be explained if we assume that the requirement that a bound pronoun be c-commanded by its antecedent is an LF condition and that long-distance scrambling must undergo total reconstruction at LF. Because the scrambled object in (5b) cannot remain in its surface position, it cannot be the antecedent of the bound pronoun. On the other hand, the acceptability of (4c) above indicates that reconstruction is not obligatory with clause-internal scrambling.[4]

Another set of data suggesting the obligatoriness of total reconstruction with long-distance scrambling concerns quantifier scope. As observed by Kuroda (1971), in the following sentence, which has the basic SOV order, only the surface scope relation is possible:

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[4] That clause-internal scrambling *can* undergo reconstruction for binding is shown by the following example:

(i) [**So-ko**$_i$-no kogaisya]-o$_j$ **Toyota-sae**$_i$-ga t_j suisensita.
that-place-Gen child:company-Acc **T.-even**-Nom recommended
'Even Toyota recommended its subsidiary.' (Ueyama 1998: 149)

On the surface, the bound pronoun in the scrambled phrase is not c-commanded by its antecedent, but it gets licensed through LF reconstruction.

(6) **Dareka**-ga **daremo**-o aisiteiru. (∃ > ∀, *∀ > ∃)
someone-Nom **everyone**-Acc love
'Someone loves everyone.'

However, as also observed by Kuroda, once the object is clause-internally scrambled across the subject, scope ambiguity emerges:

(7) *Clause-internal scrambling of a quantifier*
Daremo-o_i **dareka**-ga t_i aisiteiru. (∃ > ∀, ∀ > ∃)
everyone-Acc **someone**-Nom love
'Everyone, someone loves.'

Now, compare (7) with (8b) below, which involves long-distance scrambling:

(8) *Long-distance scrambling of a quantifier*
a. **Dareka**-ga [Tanaka-ga **daremo**-o aisiteiru to] itta. (*∀ > ∃)
someone-Nom T.-Nom **everyone**-Acc love C said
'Someone said that Tanaka loves everyone.'
b. **Daremo**-o_i **dareka**-ga [Tanaka-ga t_i aisiteiru to] itta. (*∀ > ∃)
everyone-Acc **someone**-Nom T.-Nom love C said
'Everyone, someone said that Tanaka loves.'

In (8b), the embedded object quantifier is scrambled to the sentence-initial position. Unlike in (7), the scrambled quantifier cannot take wide scope over the quantifier in the matrix subject. If a scope relation is determined by an LF c-command relation, as is widely assumed, the contrast between (7) and (8b) can also be explained on the

assumption that long-distance scrambling, but not clause-internal scrambling, undergoes reconstruction obligatorily. Because the scrambled object in (8b) must be put back into the embedded clause, it cannot take scope in the matrix clause, exactly on a par with the embedded object in (8a).

3.2 Must Reconstruction Be Total?

The total reconstruction property of Japanese scrambling, especially the obligatoriness of total reconstruction with long-distance scrambling, has attracted much attention, and a number of elaborate analyses have been proposed to account for it (Bošković and Takahashi 1998, Fukui and Kasai 2004, Kawamura 2004, Kitahara 2002, Saito 2003, Sauerland and Elbourne 2002, among many others). However, to the best of my knowledge, no serious effort has been made to find the empirical evidence that the reconstruction that Japanese scrambling undergoes must be total, rather than partial. Must it really be total?

3.2.1 Total reconstruction and partial reconstruction

It may be worth making clearer the difference between total reconstruction and partial reconstruction at this point. Under the copy theory of movement, the process of total reconstruction can be represented as in (9).

(9) *Total reconstruction*

Syntax: …… XP_i …… XP_i …… → LF: …… ~~XP_i~~ …… XP_i ……

Here, the phrase XP has been moved in syntax, and its higher copy gets completely deleted at LF. As a result, nothing remains in the higher position.[5] On the other hand, the process of partial reconstruction can be represented as in (10).

(10) *Partial reconstruction*

Syntax: …… XP_i …… XP_i …… → LF: …… XP_i …… XP_i ……

$\{F_1F_2F_3\}$ $\{F_1F_2F_3\}$ $\{\sout{F_1}F_2\sout{F_3}\}$ $\{F_1\sout{F_2}F_3\}$

This time, what is deleted at LF is not the whole copy in the higher position: In the case of partial reconstruction, some of the features of the moved phrase are deleted in the higher position, while the others are deleted in the lower position.[6] Thus, unlike total reconstruction, partial reconstruction does not make the higher position empty.

Returning to the issue about the nature of the reconstruction of scrambled phrases in Japanese, now our question can be stated in the following way: Why does the reconstruction of scrambled phrases have to be analyzed as the type in (9), rather than the type in (10)?

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[5] But see Boeckx 2001, where it is argued that total reconstruction should be regarded as lowering of moved elements, rather than the process of copy-deletion, as shown in (9). See also Sauerland and Elbourne 2002 and Ueyama 1998, where it is claimed that total reconstruction effects result from PF movement. These alternative views do not affect our discussion below.

[6] The type of partial reconstruction which can be represented as in (i) is to be taken as a subcase of (10).

(i) Syntax: …… $[X[YP]]_i$ ……$[X[YP]]_i$ …… → LF: …… $[X[\sout{YP}]]_i$ ……$[\sout{X}[YP]]_i$ ……

Here, every feature of YP is deleted in the higher position and every feature of X is deleted in the lower position.

3.2.2 Problems with Saito's (1989) argument

Saito (1989) has a theory-internal reason to claim that the reconstruction in question must be total. Actually, for him, reconstruction is always total. This is so because, as seen above, he made the following two assumptions:

(11) *Two assumptions adopted in Saito 1989*

a. Reconstruction is a lowering operation.

b. The PBC is operative (i.e. traces must be properly bound).

From these assumptions, it follows that if any moved element is interpreted lower than its surface position, it undergoes total reconstruction, leaving no "trace" behind. Otherwise, the trace left behind should violate the PBC:

(12) *Total reconstruction*

… XP_i …… t_i … → ……. XP_i …
|_____↑ ^{ok}PBC

(13) *Reconstruction leaving a trace behind (or partial reconstruction)*

… XP_i …… t_i … → … t_i …… XP_i …
|_____↑ *PBC

However, Saito's conceptual reasoning is not convincing enough to eliminate the possibility of partial reconstruction in the theoretical framework assumed in the present work, where his two assumptions may both be questioned. First, although reconstruction used to be considered to be a lowering operation in the time of Saito 1989, it (or at least partial reconstruction; see footnote 4) is no longer regarded as a lowering operation under

the copy theory; it is rather regarded as a copy-deletion process, as shown above. Second, in the current framework, the status of the PBC is unclear (see, for example, Boeckx 2002, Collins 1994, and Kitahara 1997 for derivational approaches to PBC effects; Kuno 2000 and Takahashi 2001 for PF approaches). For example, nowadays, lowering as shown in (13) is arguably ruled out not by the PBC, but by the condition that movement can target only a c-commanding position (Kitahara 1997). If so, however, lowering should be blocked whether it leaves behind a trace or not, so that total reconstruction as shown in (12), or lowering which leaves behind no trace, should also be banned.[7]

Since the assumptions on which Saito bases his claim turn out to be open to question, it seems safe to say that we have no convincing conceptual reason to believe that the type of reconstruction that Japanese scrambling undergoes is total reconstruction, not partial reconstruction (see also Miyagawa 2005a for a further extensive critical examination of Saito 1989).

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[7] In order to explain PBC effects with multiple applications of scrambling, Saito (1989) assumes that the PBC may apply at S-structure. As an illustration, consider the following example:

(i) *[[Mary-ga t_i yonda to]$_j$ [sono hon-o$_i$ [John-ga t_j itta]]]
Mary-Nom read C that book-Acc John-Nom said
'John said that Mary read that book.' (Saito's (1989) (28))

In the derivation of (i), first, the embedded object *sono hon-o* 'that book' is scrambled out of the embedded clause, and then, the embedded clause itself is scrambled to the initial position of the matrix clause. In the resulting structure, the trace of *sono hon-o* (t_i) is not bound, hence a violation of the PBC. However, if a scrambled phrase can be totally reconstructed into its base position at LF, as argued by Saito, the ungrammaticality of (i) should indicate that LF is not the only level where the PBC is operative: Otherwise, (i) would be acceptable because there should be no unbound trace in its LF representation after total reconstruction (Saito 1989, 1992). To solve this problem, Saito assumes that the PBC may apply at S-structure. Such reliance on S-structure, however, contradicts the major assumptions of the minimalist framework, assumed throughout the present thesis (Chomsky 1993).

3.2.3 Conceptual argument against the total reconstruction

Interestingly, we can make a conceptual reasoning to the opposite effect in the current framework. First, suppose that the following condition on optional operations, which is proposed by Chomsky (2001) based on the ideas of Fox (1995, 2000) and Reinhart (1998), is on the right track:

(14) Optional operations can apply only if they have an effect on LF outcome (Chomsky 2001: 34; footnote 62).

Next, suppose, as widely believed, that Japanese scrambling is a purely optional operation (cf. Fukui 1993, Kuroda 1988, Saito 1989, 2004, Saito and Fukui 1998, Takano 1998, among others). From these two assumptions it follows that reconstruction of a scrambled phrase in Japanese *cannot* be total, because the total reconstruction would "wipe off" the possible LF output effect of the scrambling.[8]

To sum up, there seems to be no reason, empirical or conceptual, to believe that the reconstruction which Japanese scrambling undergoes is not partial but total. Rather, there seems to be a conceptual reason to believe the opposite. In the following section, I will show that there is also empirical evidence indicating that only partial reconstruction is available to Japanese scrambling.

[8] Ishihara (2000) argues that, contrary to Saito's original insight, scrambling is not semantically vacuous, in the sense that it has an effect on the focus structure of the sentence.

3.3 Reconstruction Is Not Total

We saw in Chapter 2 that there is evidence that the CSC should be regarded as a condition on LF representations. The assumptions which the LF Representational CSC are based on are repeated below:

(15) *LF Representational CSC*

a. A sentence with a coordinate structure is well-formed only if each of its component structures independently satisfies grammatical constraints.

b. Component structures of a sentence with a coordinate structure $=_{def}$ structures each of which is composed of one of the conjuncts together with the material which is not included by the coordinate structure.

On the other hand, as seen in section 2.2.2 of Chapter 2, Lin (2001) argues that reconstruction of a moved phrase may nullify the Representational CSC. So, in (16), an English sentence with Gapping, although the subject in the first conjunct undergoes non-ATB movement to Spec,IP as shown in (17) (Johnson 1996), this does not induce a CSC effect, because it is reconstructed to its base position at LF.[9]

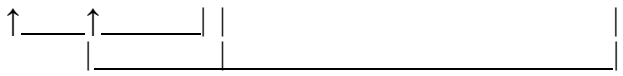
(16) *Gapping*

Bob dusted the bookcase and Mary, the windowsill.

[9] Lin (2001) does not state explicitly about which type of reconstruction is involved in English Gapping. See the discussion in the next section.

(17) *Johnson's (1996) analysis of Gapping*

[$_{IP}$ Bob$_i$ dusted$_j$ [[$_{VP}$ t_i t_j the bookcase] and [$_{VP}$ Mary t_j the windowsill]]]



At LF, the component structures of the sentence look like (18a) and (18b), where no grammatical constraints are violated.

(18) *Component structures of (16)*

a. dusted$_j$ Bob t_j the bookcase

b. dusted$_j$ Mary t_j the windowsill

If the reconstruction of the subject did not take place, the Theta Criterion would be violated in one of the component structures, which would look like *Bob dusted$_j$ Mary* t$_j$ *the windowsill*.

Suppose then that, as is widely believed, scrambled phrases can be totally reconstructed, or reconstructed without leaving anything in their scrambled positions, in Japanese. Now, we can make an interesting prediction: Japanese scrambling does not exhibit CSC effects. Since total reconstruction of a scrambled phrase should wipe out the record of the movement at LF, the CSC as an LF condition should never be able to detect it.

This prediction is not borne out: Japanese scrambling does exhibit CSC effects. First, observe the following examples (cf. Tokashiski 1989): [10,11]

[10] In what follows, I illustrate the CSC effect only with one of the conjuncts for each relevant paradigm, but, unless otherwise stated, the same effect can be detected with the other conjunct.

(19) *CSC effect with (clause-internal) scrambling*

a. Yamada kyoozyu-ga [$_{VP}$ Taroo-o home]&[$_{VP}$ Hanako-o sikatta].
Y. prof.-Nom T.-Acc praise H.-Acc scolded
'Prof. Yamada praised Taroo and scolded Hanako.'

b. *Hanako-o$_i$ Yamada kyoozyu-ga [$_{VP}$ Taroo-o home]&[$_{VP}$ t_i sikatta].
H.-Acc Y. prof.-Nom T.-Acc praise scolded
'Hanako, Prof. Yamada praised Taroo and scolded.'

c. Hanako-o$_i$ Yamada kyoozyu-ga [$_{VP}$ kyoo t_i home]&[$_{VP}$ kinoo t_i sikatta].
H.-Acc Y. prof.-Nom today praise yesterday scolded
'Hanako, Prof. Yamada praised today and scolded yesterday.'

(19a) is a normal sentence with VP coordination. In (19b), the object in the second VP conjunct is scrambled to the sentence-initial position, and the resulting structure is ill-formed.[12] In (19c), the object is extracted from both the conjuncts in an ATB fashion, and the result gives rise to no problem. If the scrambling of the object in (19b) can be undone,

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[11] In Kato 2006, which was written before I discovered the evidence for the Representational CSC from Japanese (see section 2.2.3 of Chapter 2 and Chapter 4), I took data as in (19) to be a possible problem for the Representational CSC, rather than for the total reconstruction hypothesis about Japanese scrambling. The discovery of the evidence made me reconsider the previous conclusion.

[12] Scrambling of the first, instead of the second, object is much more acceptable (Tokashiki 1989):

(i) (?)Taroo-o$_i$ Yamada kyoozyu-ga t_i home & Hanako-o sikatta.
T.-Acc Y. prof.-Nom praise H.-Acc scolded
'Taroo, Prof. Yamada praised and scolded Hanako.'

See Chapter 7 for an explanation.

the LF representations of the component structures of the example should be like the following, where no grammatical constraints are violated:[13]

(20) *Alleged component structures of (19b)*

a. Yamada kyoozyu-ga [Taroo-o home] -ta
   Y. prof.-Nom T.-Acc praise Past

b. Yamada kyoozyu-ga [Hanako-o sikat] -ta
   Y. prof.-Nom H.-Acc scold Past

Therefore, the conclusion we should draw is that, contrary to the "common sense" in Japanese syntax, Japanese scrambling cannot undergo total reconstruction.

Long-distance scrambling, which is believed to undergo total reconstruction obligatorily, also fails to behave as believed. In the following examples, two VPs are conjoined and each of them contains an embedded clause:

(21) *CSC effect with long-distance scrambling*

a. John-wa [$_{VP}$[$_{CP}$ Yamada kyoozyu-ga Taroo-o hometa to] ii]&
   J.-Top Y. prof.-Nom T.-Acc praised C say
   [$_{VP}$[$_{CP}$ Tanaka kyoozyu-ga Hanako-o sikatta to] omotta].
   T. prof.-Nom H.-Acc scolded C thought
   'John said that Prof. Yamada praised Taroo and thought Prof. Tanaka scolded Hanako.'

[13] In these representations, the tense suffix *–ta* is located under I^0. Recall that it is assumed to be attached to the second verb through PF affix-hopping (see section 1.4 of Chapter 1).

b. *Hanako-o$_i$ John-wa [$_{VP}$[$_{CP}$ Yamada kyoozyu-ga Taroo-o hometa to] ii]&
H.-Acc J.-Top Y. prof.-Nom T.-Acc praised C say
[$_{VP}$[$_{CP}$ Tanaka kyoozuu-ga t_i sikatta to] omotta].
T. prof.-Nom scolded C thought
'Hanako, John said that Prof. Yamada praised Taroo and thought that Prof. Tanaka scolded.'

c. Hanako-o$_i$ John-wa [$_{VP}$[$_{CP}$ Yamada kyoozyu-ga t_i hometa to] ii] &
H.-Acc J.-Top Y. prof.-Nom praised C say
[$_{VP}$[$_{CP}$ Tanaka kyoozyu-ga t_i sikatta to] omotta].
T. prof.-Nom scolded C thought
'Hanako, John said that Prof. Yamada praised and thought that Prof. Tanaka scolded.'

Example (21b), where the embedded object in one of the VP conjuncts is scrambled to the sentence-initial position, is unacceptable, which is unexpected under the Representational CSC if total reconstruction is available to long-distance scrambling: The total reconstruction of the scrambled phrase should make the LF representation of (21b) identical to that of (21a), so that the former should be well-formed on a par with the latter.

The same point is made by the next set of examples, where a coordinate VP appears in an embedded clause:

(22) *CSC effect with long-distance scrambling*

a. John-wa [$_{CP}$ Yamada kyoozyu-ga[$_{VP}$ Taroo-o home]&[$_{VP}$ Hanako-o sikatta]
J.-Top Y. prof.-Nom T.-Acc praise H.-Acc scolded
to] itta.
C said
'John said that Prof. Yamada praised Taroo and scolded Hanako.'

b. *Hanako-o$_i$ John-wa [$_{CP}$ Yamada kyoozyu-ga[$_{VP}$ Taroo-o home]&[$_{VP}$ t_i
H.-Acc J.-Top Y. prof.-Nom T.-Acc praise
sikatta] to] itta.
scolded C said
'Hanako, John said that Prof. Yamada praised Taroo and scolded.'

c. Hanako-o$_i$ John-wa [$_{CP}$ Yamada kyoozyu-ga[$_{VP}$ kyoo t_i home]&
H.-Acc J.-Top Y. prof.-Nom today praise
[$_{VP}$ kinoo t_i sikatta] to] itta.
yesterday scolded C said
'Hanako, John said that Prof. Yamada praised today and scolded yesterday.'

Again, the ungrammaticality of (22b) is incompatible with the alleged availability, let alone obligatoriness, of total reconstruction with long-distance scrambling.

Interestingly, but not surprisingly, even in cases where there seems to be a "reason" to reconstruct, scrambled phrases refuse to undergo total reconstruction. First,

consider the following examples, which are modeled on Saito's (1989) original examples to illustrate the total reconstruction property of Japanese scrambling (see (1)):[14]

(23) a. John-ga [$_{CP}$ Yamada kyoozyu-ga[$_{VP}$ **dare**-o home]&[$_{VP}$ **dare**-o sikatta]
J.-Nom Y. prof.-Nom **who**-Acc praise **who**-Acc scolded
ka] siritagatteiru.[15]
Q want:to:know
'John wants to know [Q Prof. Yamada praised who and scolded who].'
'John wants to know who are the persons x and y such that Prof. Yamada praised x and scolded y.'

b. ***Dare**-o$_i$ John-ga [$_{CP}$ Yamada kyoozyu-ga [$_{VP}$ **dare**-o home]&
who-Acc J.-Nom Y. prof.-Nom **who**-Acc praise
[$_{VP}$ t_i sikatta] **ka**] siritagatteiru.
scolded **Q** want:to:know
'Who, John wants to know [Q Prof. Yamada praised who and scolded].'

[14] Thanks to Norvin Richards (personal communication) for pointing out to me the importance of examples like these.

[15] English examples with ATB distribution of in-situ *wh*-phrases are ill-formed:

(i) *Who said that John bought **what** and that Peter sold **what**? (Bošković and Franks 2000)

This difference between English and Japanese is the issue to be taken up in Chapter 6.

c. ?**Dare**-o John-ga [$_{CP}$ Yamada kyoozyu-ga [$_{VP}$ kyoo t_i home]&
who-Acc J.-Nom Y. prof.-Nom today praise
[$_{VP}$ kinoo t_i sikatta] **ka**] siritagatteiru.
yesterday scolded **Q** want:to:know
'Who, John wants to know [Q Prof. Yamada praised today and scolded yesterday.'
'John wants to know who is the person x such that Prof. Yamada praised x today and scolded x yesterday.'[16]

Recall that Saito (1989) claims that in a sentence like the following the scrambled *wh*-phrase is (totally) reconstructed into the embedded clause so that it can be licensed by the embedded Q-marker:[17]

(24) ?**Dono hon**-o$_i$ Taroo-ga [Hanako-ga t_i katta **ka**] siritagatteiru.
which book-Acc T.-Nom H.-Nom bought **Q** want:to:know
'Which book, Taroo wants to know [Q Hanako bought].'

If so, the scrambled *wh*-phrase in (23b) should be reconstructed into the embedded question on the same score. In this sense, it has a "reason" to undergo reconstruction. The unacceptability of the example shows, however, that, in spite of this "reason," the reconstruction that the scrambling undergoes cannot be total.

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[16] Notice the difference in interpretation between (23a) and (23c): (23a) is a question about two individuals, while (23c) is a question about one. I hesitate to declare that the interpretation as in (23a) is completely unavailable in (23c), but it would be very weak if possible at all.

[17] But in the next section it will be suggested that a scrambled *wh*-phrase in this type of examples is licensed in the course of the derivation without being reconstructed.

The next case where a scrambled phrase fails to undergo total reconstruction although it seems to have a "reason" to be reconstructed has to do with binding. We noted above that clause-internal scrambling can create a new binding relation. The relevant example ((4c)) is repeated below:

(25) **A-sya-ni-sae$_i$** [**so-ko$_i$**-no oyagaisya]-ga t_i Toyota-o
A-company-Dat-even **that-place**-Gen parent:company-Nom T.-Acc
suisensita.
recommended
'Its parent company recommended Toyota to even Company A.'

Now, observe the acceptability of (26b) below, in which the object anaphor is scrambled across the co-referential subject (cf. Saito 1992).

(26) a. **John$_i$**-ga **zibun-zisin$_i$**-o syoosansita.
J.-Nom **self-self**-Acc praised
'John praised himself.'

b. **Zibun-zisin$_i$**-o$_j$ **John$_i$**-ga t_j syoosansita.
self-self-Acc **J.**-Nom praised
'Himself, John praised.'

If the landing site of clause-internal scrambling is always the same, which is natural under the uniform view of scrambling assumed by a number of researchers (e.g., Kitahara 2002, Saito 2003, Tada 1993), the scrambled anaphor in (26b) should be in a position from which it binds the name in the subject position, just as the scrambled phrase in (25)

is in a position from which it binds into the subject. Thus, the scrambled phrase in (26b) has a "reason" to be reconstructed, since otherwise Binding Condition C would be violated (cf. Saito 2003). Even in this environment, total reconstruction of a scrambled phrase is impossible, which is shown in the following examples:

(27) a. **John$_i$**-ga [Hanako-o hihansi]&[**zibun-zisin$_i$**-o syoosansita].
J.-Nom H.-Acc criticize **self-self**-Acc praised
'John criticized Hanako and praised himself.'

b. ***Zibun-zisin$_i$**-o$_j$ **John$_i$**-ga [Hanako-o hihansi]&[t_j syoosansita].
self-self-Acc **J.**-Nom H.-Acc criticize praised
'Himself, John criticized Hanako and praised.'

c. **Zibun-zisin$_i$**-o$_j$ **John$_i$**-ga [kyoo t_j hihansi]&[kinoo t_j syoosansita].
self-self-Acc **J.**-Nom today criticize yesterday praised
'Himself, John criticized today and praised yesterday.'

If the reconstruction that the scrambled anaphor in (27b) undergoes were total reconstruction, the example should satisfy the Representational CSC and be acceptable, contrary to fact.

To summarize the discussion, I have argued that Japanese scrambling cannot undergo total reconstruction, contrary to the belief which most Japanese syntacticians cherish (see also Miyagawa 2005a, to appear, Tanaka 2003; Miyagawa's (2005a) claim will be examined in some detail in section 3.5).

3.4 Reconstruction Is Partial

On the basis of the discussion so far, I claim that the type of reconstruction available to Japanese scrambling is partial reconstruction (see (10)). More specifically, I propose the following hypothesis on the nature of the reconstruction in question:

(28) *Partial reconstruction hypothesis on Japanese scrambling*

Scrambled phrases may undergo partial reconstruction in Japanese. Semantic features (e.g., features relevant to binding and scope) can be reconstructed, or deleted in the moved positions at LF, while formal features (e.g., phi- and categorial features) cannot.[18]

Let us reconsider some of the examples seen above in the light of this hypothesis. First, consider sentence (7), repeated below as (29).

(29) **Daremo**-o$_i$ **dareka**-ga t_i aisiteiru. ($\exists > \forall$, $\forall > \exists$)
everyone-Acc **someone**-Nom love
'Everyone, someone loves.'

In this sentence, the object universal quantifier has been scrambled across the subject existential quantifier, and both the surface and the inverse scope can be obtained. Recall that in the non-scrambled counterpart of this sentence, only the surface scope relation is possible, as shown in (30) (= (6)).

[18] I assume following Lasnik (1995b) that features relevant for scope and binding are not part of formal features. But see Watanabe 2000b, where it is argued that phi-features play a role in bindng.

(30) **Dareka**-ga **daremo**-o aisiteiru. (∃ > ∀, *∀ > ∃)

someone-Nom **everyone**-Acc love

'Someone loves everyone.'

Thus, the inverse scope in (29) (i.e. ∃ > ∀) can be considered to result from reconstruction of the scrambled object QP to its base position. Under the partial reconstruction hypothesis in (28), what is reconstructed is not the whole scrambled phrase, but its features relevant to scope interpretation: The reconstruction leaves the other features of the scrambled phrase, such as phi-features and categorial features, in the scrambled position. Using copy-theoretic notation, the result of the reconstruction can be represented along the lines of (31) ("φ" = phi-features; "N" = categorial features (noun); "$" = features relevant to scope interpretation).[19]

(31) *Partial reconstruction for scope*

Daremo-o_i	dareka-ga	daremo-o_i	aisiteiru
{φ,N,~~$~~,…}	{φ,N,$,…}	{~~φ,N~~,$,…}	
everyone-Acc	someone-Nom		love

Here, the scope features of the scrambled phrase are deleted in the higher position, but some other features including the phi-features and the categorial features remain in that position. Since the scope features of the universal quantifier are c-commanded by those

[19] Here I assume without discussion that Japanese nouns have phi-features. I note, however, that Naoki Fukui (personal communication) expressed his skepticism about this assumption.

I also tentatively assume that each feature remains only in one position at LF: To put it differently, all but one copy of a feature are deleted at LF. Although the validity of this assumption is not clear, nothing in our discussion below hinges on it.

of the existential quantifier in the resulting representation, the LF interface reads the wide scope interpretation of the existential quantifier.

In section 3.1.2 above, we saw several pieces of evidence which have been argued to show that a long-distance scrambled phrase obligatorily undergoes total reconstruction. The relevant examples ((5b) and (8b)) are repeated here:

(32) ?***Toyota-ni-sae**$_i$ [**so-ko**$_i$-no bengosi]-ga [John-ga t_i ayamatta to]
T.-Dat-even **that-place**-Gen attorney-Nom J.-Nom apologized C
omotteiru.
think
'Its attorney thinks that John apologized to even Toyota.'

(33) **Daremo**-o$_i$ **dareka**-ga [Tanaka-ga t_i aisiteiru to] itta. (*$\forall > \exists$)
everyone-Acc **someone**-Nom T.-Nom love C said
'Everyone, someone said that Tanaka loves.'

In (32), the long-distance scrambled antecedent cannot license the bound pronoun in the matrix subject, and in (33), the long-distance scrambled universal quantifier cannot take wide scope over the matrix subject existential quantifier. The partial reconstruction hypothesis in (28) forces us to reinterpret the above data as indicating that partial reconstruction of scope and binding features of a long-distance scrambled phrase is obligatory, not that total reconstruction is obligatory in the case of long-distance scrambling. This result urges us to reexamine the existing analyses of the obligatoriness of reconstruction with long-distance scrambling (Bošković and Takahashi 1998, Fukui

and Kasai 2004, Kawamura 2004, Kitahara 2002, Saito 2003, Sauerland and Elbourne 2002, among many others), because most (if not all) of them crucially rely on the assumption that the type of reconstruction which Japanese scrambling undergoes is total reconstruction. I leave the reexamination and proposing an alternative analysis (if necessary) for future research (see also footnote 3).

Now, let us consider how the ungrammaticality of (19b), repeated below as (34), can be explained by the Representational CSC under the hypothesis that scrambled phrases can undergo only partial reconstruction.

(34) *Hanako-o_i Yamada kyoozyu-ga [$_{VP}$ Taroo-o home]&[$_{VP}$ t_i sikatta].
H.-Acc Y. prof.-Nom T.-Acc praise scolded
'Hanako, Prof. Yamada praised Taroo and scolded.'

In this example, the object in the second conjunct has been scrambled to the sentence-initial position, inducing a CSC effect. As discussed above, if the scrambled phrase could undergo total reconstruction, the CSC effect could not be captured by the Representational CSC. In contrast, the effect can be captured under the partial reconstruction hypothesis. Suppose the scrambled phrase *Hanako-o* undergoes partial reconstruction and some of its features are deleted in its surface position. Whatever the deleted features are, the partial reconstruction hypothesis in (28) requires that at least the formal features (e.g., the phi- and the categorial features) of the scrambled phrase must remain undeleted in the scrambled position. Thus, the LF representation of (34) should be something like (35) and its component structures should look like (36a) and (36b).

(35) *Partial reconstruction of the scrambled phrase*

Hanako-o$_i$ Yamada kyoozyu-ga [Taroo-o home]&[Hanako-o$_i$ sikat] -ta

{φ,N,~~F$_x$,F$_y$~~,…} {~~φ,N~~,F$_x$,F$_y$,…}

H.-Acc Y. prof.-Nom T.-Acc praise scold Past

(36) *Component structures of (34)*

a. Hanako-o$_i$ Yamada kyoozyu-ga [Taroo-o home] -ta

{φ,N,~~F$_x$,F$_y$~~,…}

b. Hanako-o$_i$ Yamada kyoozyu-ga [Hanako-o$_i$ sikat] -ta

{φ,N,~~F$_x$,F$_y$~~,…} {~~φ,N~~,F$_x$,F$_y$,…}

Suppose that the phi- and/or categorial features of *Hanako-o* are enough to ensure this NP's status as an argument. Then, because this argument is not assigned a theta-role in (36a), the Theta-Criterion is violated, and the unacceptability of example (34) is explained by the Representational CSC.

Recall that Lin (2001) argues that in English Gapping sentences, reconstruction of the raised subject has an effect of avoiding a violation of the Representational CSC (see section 2.2.2 of Chapter 2). Thus, although it appears that the component structures of (37) below are (38a) and (38b) and one of these, or (38b), violates the Theta Criterion, reconstruction of *Bob* saves the sentence from the violation.

(37) *Gapping*

[$_{IP}$ Bob$_i$ dusted$_j$ [[$_{VP}$ t_i t_j the bookcase] and [$_{VP}$ Mary t_j the windowsill]]]

(38) *Apparent component structures of (37)*

a. [Bob$_i$ dusted$_j$ [t_i t_j the bookcase]]

b. [Bob$_i$ dusted$_j$ [Mary t_j the windowsill]]

If our discussion so far is on the right track, this may be taken to indicate that the reconstruction involved in sentences like (37) is total reconstruction.[20] I speculate that the difference in availability of total reconstruction between subject raising in English and scrambling in Japanese lies in the obligatoriness/optionality of the operations. As discussed in section 3.2.3 above, given the following condition on optional operations, an optional operation like scrambling cannot undergo total reconstruction, since this would result in "wiping off" possible effects of the operation on LF outcome:

(39) Optional operations can apply only if they have an effect on LF outcome.

In contrast, an obligatory operation like subject raising in English need not be licensed by this condition, so that it is possible to erase the history of the movement.[21]

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[20] See Sauerland and Elbourne 2002, where it is claimed that raising to the subject position in English can be totally reconstructed.

[21] Norbert Hornstein (personal communication) suggested to me another way of cutting the pie. Suppose the well-known example in (i) below indicates that English *wh*-movement may undergo partial reconstruction, as shown in (ii) (cf. Chomsky 1995).

(i) Which pictures of himself did John like?

(ii) [Which ~~pictures of himself~~] did John like [~~which~~ pictures of himself]

Suppose further that scrambling is a sort of focus movement, as suggested for Japanese in Ishihara 2000, Ishii 1997, and Miyagawa 1997, 2005b (see also Ishii 2001). On these assumptions, it might be possible to say that focus-related movements (such as *wh*-movement and scrambling) may only undergo partial reconstruction, while other movements (like EPP-driven subject raising) may undergo total reconstruction. I do not pursue the issue of what determines the availability of total reconstruction to a given movement any further here, leaving it for future research.

Finally, let us reconsider the examples in (40) (= (1)), Saito's original examples to illustrate the "total reconstruction property" of Japanese scrambling.

(40) a. Taroo-ga [Hanako-ga **dono hon**-o katta **ka**] siritagatteiru.
T.-Nom H.-Nom **which book**-Acc bought **Q** want:to:know
'Taroo wants to know [Q which book Hanako bought].'

b. ***Dare**-ga [Hanako-ga sono hon-o katta **ka**] siritagatteiru.
who-Nom H.-Nom the book-Acc bought **Q** want:to:know
'Who wants to know [Q Hanako bought the book].'

c. ?**Dono hon**-o_i Taroo-ga [Hanako-ga t_i katta **ka**] siritagatteiru.
which book-Acc T.-Nom H.-Nom bought **Q** want:to:know
'Which book, Taroo wants to know [Q Hanako bought].'

As seen above, Saito (1989) assumes based on the contrast in grammaticality between (40a) and (40b) that *wh*-phrases must be contained in a Q-marked clause, and claims that the scrambled *wh*-phrase in (40c), which is outside the Q-marked clause at the surface, undergoes (total) reconstruction back into the embedded clause. Now, it seems reasonable to assume that what is to be licensed by being in a Q-marked clause in the above examples is actually a specific feature of the *wh*-phrase, and let us call it a *wh*-feature. If this feature is assumed to be a formal feature, however, the partial reconstruction hypothesis on Japanese scrambling in (28) prevents us from maintaining Saito's original idea that the scrambled *wh*-phrase in (40c) is licensed by being reconstructed: The *wh*-feature of this phrase, as a formal feature, cannot be reconstructed and must remain in the scrambled position, so that even if the scrambled phrase

undergoes (partial) reconstruction, the requirement that the *wh*-feature be contained in a Q-marked clause cannot be met ("wh" = *wh*-feature):

(41) *Partial reconstruction of the scrambled* wh-*phrase*

Dono hon-o_i …… [$_{CP}$ …… dono hon-o_i …… ka] ……

{wh,~~F_x,F_y~~,…} {~~wh~~,F_x,F_y,…}

who-Acc Q

Then, how is the *wh*-phrase in (40c) licensed?

I suggest that this phrase is licensed in the course of the derivation without being reconstructed (cf. Miyagawa 2005a). First, assume the null operator analysis of Japanese *wh*-questions proposed by Watanabe (1992a, b). In this analysis, a null operator is assumed to be base-generated inside a *wh*-phrase and move to Spec,CP to check the relevant features, as shown below (in Chapter 6, an argument for this analysis will be provided; see also Hagstrom 1998):

(42) a. [$_{CP}$ Op_i [$_{C'}$ Taroo-ga [t_i [nani-o]] tabeta no]]

T.-Nom what-Acc ate Q

'What did Taroo eat?'

b. [$_{CP}$ Op_i [$_{C'}$ …… [t_i [WH]] …… C^0]]

↑_____|

If this analysis of Japanese *wh*-questions is adopted, we can maintain that the *wh*-feature of the *wh*-phrase in (40c) is checked before this phrase is scrambled out of the embedded clause: First, at the stage of the derivation where the embedded clause has been

constructed (cf. (43a)), the null operator associated with the *wh*-phrase moves to the embedded Spec,CP for *wh*-feature checking (cf. (43b)), and then, later in the derivation, the *wh*-phrase undergoes long-distance scrambling into the matrix clause (cf. (43c)).

(43) *Possible derivation of (40c)*

a. [$_{CP}$ [$_{C'}$ …… [Op [dono hon-o]] …… ka]

which book-Acc Q

b. [$_{CP}$ Op$_i$ [$_{C'}$ …… [t_i [dono hon-o]] …… ka]

↑_____|

c. [t_i [dono hon-o]]$_j$ …… [$_{CP}$ Op$_i$ [$_{C'}$ …… t_j …… ka]

↑_____|

Note that in this derivation, the feature of the *wh*-phrase to be licensed in the embedded clause need not undergo reconstruction.[22]

3.5 Miyagawa 2005a

Although the total reconstruction property of Japanese scrambling has been widely believed, this does not mean that there is no one that has doubted it. Miyagawa (2005a, to

[22] Miyagawa (2005a) suggests another possible derivation for examples like (40c) where the scrambled *wh*-phrase is licensed in the course of the derivation without being reconstructed. In this derivation, the scrambling of the *wh*-phrase into the matrix clause stops by the embedded Spec,CP, which counts as a *wh*-movement, so that the relevant feature of the *wh*-phrase gets licensed at this point (a similar derivation was independently suggested to me by Ora Matushansky (personal communication)):

(i) *Another possible derivation of (40c)*

dono hon-o …… [$_{CP}$ [$_{C'}$ …… *t* …… ka]] ……

↑_____|↑_____|

"*wh*-movement"

appear) is such an exception (see also Tanaka 2003). He takes a similar position to mine in that he claims that total reconstruction is not so freely available to scrambling as commonly believed.

The hypothesis Miyagawa (2005a) pushes is the following:

(44) Total reconstruction occurs only when the scrambling is not motivated by any universal conditions on movement (Miyagawa's (2005a) (46)).

He proposes several ways for scrambling to be motivated, which I enumerate below:

(45) Clause-internal A-scrambling is motivated by the EPP (Miyagawa 2001, 2003).

(46) Non-EPP-driven scrambling is an optional movement and as such motivated only if it has an effect on LF outcome (see (39) above).[23]

a. Non-EPP-driven scrambling of an ordinary nominal or an R-expression is motivated because it has an effect on the focus structure of the sentence (Ishihara 2000, Neeleman and Reinhart 1998).

b. Non-EPP-driven scrambling of a quantifier is motivated only when it creates a new scope relation (Fox's (2000) Scope Economy).

c. Non-EPP-driven scrambling of a *wh*-phrase is motivated because it has an effect of making the *wh*-phrase D-linked.

I will not go into the details of each of these cases, and the reader is referred to Miyagawa 2005a for relevant illustrations and discussions. What I would like to do here is to

[23] As non-EPP-driven scrambling, Miyagawa discusses only long-distance scrambling, but clause-internal A'-scrambling should also be a case of such movement.

examine the net result of his theory in terms of its compatibility with the LF nature of the CSC.

From the theory summarized in (44)-(46), it follows that total reconstruction occurs only if a quantifier is moved by unmotivated optional movement (Miyagawa 2005a: (58)). Recall that in example (8b)/(33), repeated here as (47), the sentence-initial quantifier, which has been scrambled out of the embedded clause, cannot take wide scope over the matrix subject, so that the sentence is scopally unambiguous.

(47) **Daremo**-o$_i$ **dareka**-ga [Tanaka-ga t_i aisiteiru to] itta. ($\exists > \forall$, $*\forall > \exists$)
everyone-Acc **someone**-Nom T.-Nom love C said
'Everyone, someone said that Tanaka loves.'

Assume that the long-distance scrambling does not proceed at one fell swoop, but stops at the initial position of the embedded clause (whatever it is) on its way to the surface position, as shown below:

(48) [QP-Acc QP-Nom [$_{CP}$ NP-Nom *t* V] V]
↑_____|↑_____|

In this derivation, the first step of the long-distance scrambling is not motivated, because the NP it crosses is not a scope-bearing element and it fails to create a new scope relation (see also Cecchetto 2004). Because the long-distance scrambling contains an unmotivated step, total reconstruction of the scrambled quantifier occurs, and the scope unambiguity follows.[24]

[24] This analysis predicts that replacing the embedded subject with a quantifier makes the sentence scopally ambiguous. This is actually what Miyagawa observes:

If the consequence of Miyagawa's theory that total reconstruction occurs only if a quantifier is scrambled without creating a new scope relation is correct, we predict that scrambling does not exhibit CSC effects in that case. Let us check this prediction by observing the following examples:

(49) a. **Dareka**-ga [$_{VP}$[$_{CP}$ Yamada-ga **subete-no hon**-o yonda to] ii]
Someone-Nom Y.-Nom **all-Gen book**-Acc read C say
&[$_{VP}$[$_{CP}$ Tanaka-ga **is-satu-no hon**-o suteta to]kangaeta].
T.-Nom **one-CL-Gen book**-Acc threw:away C thought
'Someone said that Yamada read every book and thought that Tanaka threw away one book.'

b. ***Subete-no hon**-o$_i$ **dareka**-ga [$_{VP}$[$_{CP}$ Yamada-ga t_i yonda to] ii]&
all-Gen book-Acc **someone**-Nom Y.-Nom read C say
[$_{VP}$[$_{CP}$ Tanaka-ga **is-satu-no hon**-o suteta to] kangaeta].
T.-Nom **one-CL-Gen book**-Acc threw:away C thought
'Every book, someone said that Yamada read and thought that Tanaka threw away one book.'

(i) **Dono ronbun-mo$_i$ dareka**-ga [t_i **sukunakutomo hitori-no kyoozyu**-ga t_i
what article-MO someone-Nom **at:least one-Gen prof.**-Nom
hihansuru to] omotteiru. (∃ > ∀, (?)∀ > ∃)
criticize C think
'Every article, someone thinks that at least one professor will criticize.'
(Miyagawa 2005a: (40))

c. **Subete-no hon**-o$_i$ **dareka**-ga [$_{VP}$[$_{CP}$ Yamada-ga t_i yonda to] ii]
all-Gen **book**-Acc **someone**-Nom Y.-Nom read C said
&[$_{VP}$[$_{CP}$ Tanaka-ga t_i suteta to] kangaeta].
T.-Nom threw:away C thought
'Every book, someone said that Yamada read and thought that Tanaka threw away.'

In (49b), the first step of the long-distance scrambling of the quantifier is not motivated, because the NP it crosses, or the embedded subject, is not a scope-bearing element and it fails to create a new scope relation. Contrary to the prediction, the example exhibits a CSC effect. Therefore, it can be concluded that Miyagawa's claim about where total reconstruction occurs is untenable.[25]

To sum up, although Miyagawa (2005a) is right in claiming that total reconstruction is not so freely available to Japanese scrambling as commonly believed, he is not quite right in that his theory allows total reconstruction to occur in an environment where it does not occur in actual fact. Given this result and the results we obtained up to the last subsection, there seems to be no problem in concluding that Japanese scrambling does not undergo total reconstruction *in any environment*.

[25] Miyagawa (to appear) alters his position, and claims that in a sentence like (47), the long-distance scrambled quantifier does not undergo total reconstruction, but cannot take scope in the matrix clause, because the first step of the scrambling is not licensed by Scope Economy. The data in (49) are compatible with this claim.

3.6 Summary

In this chapter I have argued that, contrary to a widely accepted view, Japanese scrambling cannot be undone at LF, or Japanese scrambled phrases cannot be totally reconstructed, proposing the following hypothesis:

(50) *Partial reconstruction hypothesis on Japanese scrambling*

Scrambled phrases may undergo partial reconstruction in Japanese. Semantic features (e.g., features relevant to binding and scope) can be reconstructed, or deleted in the moved positions at LF, while formal features (e.g., phi- and categorial features) cannot.

I based my argument on the LF nature of the CSC, which I hope to have established in the last chapter, and the observation that Japanese scrambling exhibits CSC effects. If the alleged total reconstruction of a scrambled phrase took place, the scrambling should not induce a violation of the Representational CSC. The denial of the long believed total reconstruction property of Japanese scrambling urges us to look at this operation in a new light.

Chapter 4
Neg-raising, Last Resort, and the Nature of the CSC

In this chapter I examine the behavior of Japanese negative concord items (NCIs) in the context of VP coordination. My aim is twofold. First, I demonstrate that Japanese has the operation of Neg-raising and that the operation is subject to the principle of Last Resort (or Scope Economy). And secondly, I argue that the last resort nature of Neg-raising provides a further piece of evidence that the CSC should be regarded as an LF representational constraint, rather than a derivational constraint.

4.1 Scope of Negation with Respect to Coordinated VPs

Recall from section 1.4 of Chapter 1 that Japanese VP coordination takes the following form (cf. Nakatani 2004, Takano 2004, Tamori 1976/7, and Tokashiki 1989):

(1) *Japanese VP coordination*

($\ldots\ldots$ V_{bare}) $\ldots\ldots$ V_{bare} $\ldots\ldots$ V_{fin}.

Here, the final verb is inflected for tense, while the non-final verbs are in their bare forms. The following is an example sentence with VP coordination ("&" = covert conjunction):[1]

(2) Taroo-ga [$_{VP}$ kesa ringo-o tabe]&[$_{VP}$ sakuban koohii-o non-da].
T.-Nom this:morning apple-Acc eat last:night coffee-Acc drink-Past
'Taroo ate an apple this morning and drank coffee last night.'

Now consider the following example:

(3) Taroo-ga kesa ringo-o tabe & sakuban koohii-o nom-**ana**-katta.
T.-Nom this:morning apple-Acc eat last:night coffee-Acc drink-Neg-Past

This is also a sentence with VP coordination, but the second verb carries a negative marker (Neg). There are three imaginable interpretations of this sentence, as described by (4a-c), but the fact is that only one of them, namely (4a), is possible.

(4) *Three imaginable interpretations of (3)*

a. Taroo ate an apple this morning and didn't drink coffee last night.

(VP_1&¬VP_2)

b. Taroo didn't eat an apple this morning and didn't drink coffee last night.

(¬VP_1&¬VP_2)

[1] In the representations that follow, I omit traces of subjects in Spec,VP. Also, as will be argued in Chapter 7, subjects in Japanese can remain within VP, so that sentence (2) can have the following structure:

(i) [$_{VP}$ Taroo$_i$-Nom this:morning apple-Acc eat]&[$_{VP}$ *pro*$_i$ last:night coffee-Acc drank]

This possibility, however, does not affect my argument below.

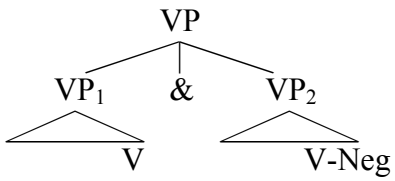
c. Taroo didn't eat an apple this morning and drink coffee last night.

$(\neg(VP_1 \& VP_2))$

Let us consider the implications of the availability of these interpretations one by one.

First, (3) can mean (4a), where Neg takes scope only within the second conjunct. This indicates that (3) can have the following structure:[2]

(5)



Next, (4b) is not a possible interpretation of (3). There, each of the predicates is negated. This indicates that (3) cannot have the following structure (see Chapter 7; see also Fukushima 1999):[3]

[2] In the present work I do not discuss exactly where Neg appears (as the result of base-generation or movement) in cartographical terms (see Zanuttini 1997, 2001, and references cited therein). The issue is immaterial for our present purposes. It will suffice here to assume that Neg appears in some head position, and that when it moves, it undergoes head-movement (see below). Exploring the issue just mentioned may reveal that what is involved in examples like (3) is not VP coordination, but something different, for example NegP coordination, but I will continue to call it VP-coordination below just for the sake of convenience.

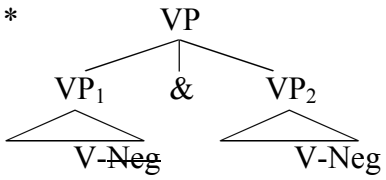
[3] Fukushima (1999: 317) observes that the following sentence can mean "Taroo didn't sing and didn't dance":

(i) Taroo-ga utai (sosite) odor-ana-katta.
T.-Nom sing and dance-Neg-Past

Although this observation appears to be incompatible with the one I make for (3), it seems possible to capture it by assuming that what are conjoined in (i) are not VPs, but verbs, so that the structure of the example is like the following:

(ii) Taroo-ga [$_V$ [$_V$ utai] (sosite) [$_V$ odor]]-ana-katta.

Here, Neg takes scope over the coordinated verb, and since logically $\neg(p\&q)$ is true if $\neg p\&\neg q$ is true, (i) can have the interpretation in which both verbs are negated.

(6) 

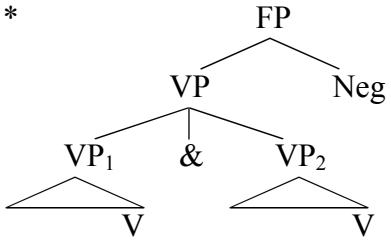
Here, each of the conjuncts contains Neg, but the Neg in the first conjunct is somehow phonologically unrealized. When one wants to express the meaning of (4b), the following sentence, where the first verb is overtly negated, must be used:

(7) Taroo-ga kesa ringo-o tabe-**zu** & sakuban koohii-o
T.-Nom this:morning apple-Acc eat-**Neg** last:night coffee-Acc
nom-**ana**-katta.
drink-**Neg**-Past
'(4b)'

What is crucial for our discussion below is that (4c) is also impossible as an interpretation of (3). In this interpretation, Neg takes scope over the whole coordinated VP, and the unavailability of this interpretation indicates that the following is not a legitimate structure for (3) ("FP" = some functional projection):

Although it seems possible to explain away Fukushima's observation, I am skeptical about the reliability of his observation. My informants agree that (i) has the interpretation in question when *sosite* 'and' does not appear, but they do not get it when *sosite* overtly appears. If this represents the robust intuition of Japanese speakers, it can be interpreted as indicating that in (i) without *sosite*, the two verbs may be analyzed as constituting a compound verb. In fact, in Japanese V-V compounds (e.g. *hasyagi-mawaru* 'frisk-go:around'), the first verb takes a bare form and the second verb takes an inflected form, exactly as in VP coordination.

(8) *



To sum up the discussion up to now, Neg on the final verb in Japanese VP coordination can take scope only within the final VP conjunct, and crucially, it cannot appear above the coordinated VP.

4.2 NCI Licensing in Component Structures

Let us turn to negative concord items (NCIs).[4] In (9a) below, *nani-mo* 'what-MO' is an NCI, and as shown by the ungrammaticality of example (9b), it must be licensed by Neg.

(9) a. Taroo-ga **nani-mo** tabe-**na**-katta.
T.-Nom **what-MO** eat-**Neg**-Past
'Taroo didn't eat anything.'

b. *Taroo-ga **nani-mo** tabe-ta.
eat-Past

Although there are several notable characteristics of Japanese NCIs, it will suffice here to note the following two differences from English negative polarity items (NPIs) (see also

[4] What I call Japanese NCIs in the present work have traditionally been regarded as negative polarity items, but Watanabe (2004b) convincingly shows that they should be best viewed as NCIs. See also Kuno, in preparation.

Giannakidou 2006 and Watanabe 2004b, among others). First, unlike English NPIs, Japanese NCIs can appear in subject position, which is illustrated in (10).

(10) *NCI in subject position*

Dare-mo John-o sir-**ana**-i.

who-MO J.-Acc know-**Neg**-Nonpast

'Nobody knows John.'

cf. *Anyone doesn't know John.

Second, unlike NPIs, object NCIs can be moved across the subject, as shown in (11).

(11) *NCI moved across the subject*

a. **Nani-mo**$_i$ Taroo-ga t_i tabe-**na**-katta.

what-MO T.-Nom eat-**Neg**-Past

'Taroo didn't eat anything.'

cf. *Anything, John didn't eat.

b. **Dare-mo**$_i$ John-wa [Yamada kyoozyu-ga t_i home-**na**-katta to] itta.

who-MO J.-Top Y. prof.-Nom praise-**Neg**-Past C said

'John said that Prof. Yamada didn't praise anyone.'

cf. *Anybody, John said that Prof. Yamada didn't praise.

In both (11a) and (11b), the NCI is scrambled to a position higher than the subject, but the resulting structures are well-formed. Because there is a requirement in Japanese that an NCI and its licensing Neg must be clause-mates, as shown in (12), I assume that in

(11b), the long-distance scrambled NCI is reconstructed into the embedded clause at LF, and that the clause-mate condition is operative at this level.[5]

(12) *Clause-mate condition on NCI licensing*

*John-wa **dare-ni-mo** [Taroo-ga sin-**ana**-katta to] itta.

J.-Top **who-Dat-MO** T.-Nom die-**Neg**-Past C said

'John said to anyone that Taroo didn't die.'

Now, let us consider the behavior of NCIs in sentences with VP coordination.[6] First, when the second conjunct contains both an NCI and Neg, as in (13), the NCI is licensed, which is shown in (14).

(13) $^{ok}[_{VP}$ ……]&[$_{VP}$ … NCI … Neg]

(14) Yamada kyoozyu-ga [$_{VP}$ kyoo Taroo-o home]&[$_{VP}$ kinoo **dare-mo**

Y. prof.-Nom today T.-Acc praise yesterday **who-MO**

sikar-**ana**-katta].

scold-**Neg**-Past

'Prof. Yamada praised Taroo today and didn't scold anyone yesterday.'

Second, when the first conjunct contains an NCI, but Neg appears in the second conjunct, as in (15), the NCI is not licensed, as shown in (16).

---

[5] In the present work, I am not concerned with the precise mechanism of NCI licensing. For this matter, see Giannakidou 2006, Y. Kato 2002, Kuno, in preparation, Watanabe 2004b, and references cited therein. (But see footnote 10 below, where I make a brief comment on this issue.)

[6] For Korean, see Kim 1995, Yi 1998, and Yoon 1993, 1994, 1997, among others.

(15) *[$_{VP}$ … NCI …]&[$_{VP}$ …… Neg]

(16) *Yamada kyoozyu-ga [$_{VP}$ kyoo **dare-mo** home]&[$_{VP}$ kinoo Hanako-o
Y. prof.-Nom today **who-MO** praise yesterday H.-Acc
sikar-**ana**-katta].
scold-**Neg**-Past
'Prof. Yamada praised anyone today and didn't scold Hanako yesterday.'

Thirdly, when each conjunct contains both an NCI and Neg, as in (17), the NCIs are licensed, as shown in (18).

(17) ^{ok}[$_{VP}$ … NCI … Neg]&[$_{VP}$ … NCI … Neg]

(18) Yamada kyoozyu-ga[$_{VP}$ kyoo **dare-mo** home-**zu**]&[$_{VP}$ kinoo **dare-mo**
Y. prof.-Nom today **who-MO** praise-**Neg** yesterday **who-MO**
sikar-**ana**-katta].
scold-**Neg**-Past
'Prof. Yamada didn't praise anyone today and didn't scold anyone yesterday.'

Fourth, when an NCI appears above a coordinated VP and each of the conjuncts contains Neg, as in (19), the NCI is licensed, as shown in (20a) and (20b), where an object NCI undergoes ATB scrambling (clause-internal and long-distance, respectively) to the sentence-initial position.

(19) ^{ok}NCI …… [$_{VP}$ …… Neg]&[$_{VP}$ …… Neg]

(20) a. **Dare-mo$_i$** Yamada kyoozyu-ga[$_{VP}$ kyoo t_i home-**zu**]&[$_{VP}$ kinoo t_i
who-MO Y. prof.-Nom today praise-**Neg** yesterday
sikar-**ana**-katta].
scold-**Neg**-Past
'Prof. Yamada praised nobody today and scolded nobody yesterday.'

b. **Dare-mo$_i$** John-wa [Yamada kyoozyu-ga[$_{VP}$ kyoo t_i home-**zu**]&
who-MO J.-Top Y. prof.-Nom today praise-**Neg**
[$_{VP}$ kinoo t_i sikar-**ana**-katta] to] itta.
yesterday scold-Neg-Past C said
'John said that Prof. Yamada praised nobody today and scolded nobody yesterday.'

Finally, when an NCI appears above a coordinated VP, but only the first conjunct contains Neg, as in (21), the NCI fails to be licensed, as shown in (22), where, again, the NCI appearing in the sentence-initial position has undergone ATB scrambling.

(21) *NCI …… [$_{VP}$ …… Neg]&[$_{VP}$ ……]

(22) ***Dare-mo$_i$** Yamada kyoozyu-ga[$_{VP}$ kyoo t_i home-**zu**]&[$_{VP}$ kinoo t_i
who-MO Y. prof.-Nom today praise-**Neg** yesterday
sikat-ta].
scold-Past
'Prof. Yamada didn't praise anyone today and scolded anyone yesterday.'

(23) is the summary of the above data.

(23) *Summary of the data seen in (13)-(22)*

a. ^{ok}[$_{VP}$ ……]&[$_{VP}$ … NCI … Neg]

b. *[$_{VP}$ … NCI …]&[$_{VP}$ …… Neg]

c. ^{ok}[$_{VP}$ … NCI … Neg]&[$_{VP}$ … NCI … Neg]

d. ^{ok}NCI …… [$_{VP}$ …… Neg]&[$_{VP}$ …… Neg]

e. *NCI …… [$_{VP}$ …… Neg]&[$_{VP}$ ……]

At this point, we can draw the following descriptive generalization:

(24) *Descriptive generalization I*

If a component structure of a sentence contains an NCI, it must also contain Neg.

The definition of component structure is repeated below:

(25) *Component structure*

Component structures of a sentence with a coordinate structure =$_{def}$ structures each of which is composed of one of the conjuncts together with the material which is not included by the coordinate structure

For example, the component structures of (23d) are the following:

(26) *Component structures of (23d)*

a. NCI …… [$_{VP}$ …… Neg]

b. NCI …… [$_{VP}$ …… Neg]

Here, each component structure contains an NCI and it also contains Neg. Thus, (23d) is grammatical. In contrast, the component structures of (23e) are the following:

(27) *Component structures of (23e)*

a. NCI …… [$_{VP}$ …… Neg]

b. *NCI …… [$_{VP}$ ……]

Here, although both component structures contain an NCI, one of them fails to contain Neg (27b). Thus, the ungrammaticality of (23e) is captured by the generalization in (24).

The examples in (28), where another type of NCI (i.e. NP-*sika* 'NP-except') is used, and the ones in (29), where an NCI appears in the subject position, confirm generalization (24).

NP-sika *'NP-except'*

(28) a. ^{ok}*[$_{VP}$ …..…]&[$_{VP}$ … NCI … Neg]*

Taroo-ga[$_{VP}$ kesa ringo-o tabe]&[$_{VP}$ sakuban **koohii-sika**

T.-Nom this:morning apple-Acc eat last:night **coffee-except**

nom-**ana**-katta].

drink-**Neg**-Past

'Taroo ate an apple this morning and didn't drink anything but coffee last night.'

b. **[$_{VP}$ … NCI …]&[$_{VP}$ …… Neg]*

*Taroo-ga [$_{VP}$ kesa **ringo-sika** tabe]&[$_{VP}$ sakuban koohii-o

T.-Nom this:morning **apple-except** eat last:night coffee-Acc

nom-**ana**-katta].

drink-**Neg**-Past

'Taroo ate anything but an apple this morning and didn't drink coffee last night.'

c. *ok[$_{VP}$ … NCI … Neg]&[$_{VP}$ … NCI … Neg]*

Taroo-ga[$_{VP}$ kesa **ringo-sika** tabe-**zu**]&[$_{VP}$ sakuban

T.-Nom this:morning **apple-except** eat-Neg last:night

koohii-sika nom-**ana**-katta].

coffee-except drink-**Neg**-Past

'Taroo didn't eat anything but an apple this morning and didn't drink anything but coffee last night.'

d. *okNCI …… [$_{VP}$ …… Neg]&[$_{VP}$ …… Neg]*

Taroo-sika$_i$ Yamada kyoozyu-ga[$_{VP}$ kyoo t_i home-**zu**]&[$_{VP}$ kinoo t_i

T.-except Y. prof.-Nom today praise-**Neg** yesterday

sikar-**ana**-katta].

scold-**Neg**-Past

'Prof. Yamada didn't praise anyone but Taroo today and didn't scold anyone but Taroo yesterday.'

d'. ^{ok}*NCI …… [$_{VP}$ …… Neg]&[$_{VP}$ …… Neg]*

Taroo-sika$_i$ John-wa [Yamada kyoozyu-ga[$_{VP}$ kyoo t_i home-**zu**]&

T.-except J.-Top Y. prof.-Nom today praise-**Neg**

[$_{VP}$ kinoo t_i sikar-**ana**-katta] to] itta.

yesterday scold-Neg-Past C said

'John said that Prof. Yamada didn't praise anyone but Taroo today and didn't scold anyone but Taroo yesterday.'

e. **NCI …… [$_{VP}$ …… Neg]&[$_{VP}$ ……]*

***Taroo-sika$_i$** Yamada kyoozyu-ga[$_{VP}$ kyoo t_i home-**zu**]&[$_{VP}$ kinoo t_i

T.-except Y. prof.-Nom today praise-**Neg** yesterday

sikat-ta].

scold-Past

'Prof. Yamada didn't praise anyone but Taroo today and scolded anyone but Taroo yesterday.'

NCI in subject position

(29) a. ^{ok}*[$_{VP}$ ……]&[$_{VP}$ … NCI … Neg]*

[$_{VP}$ Taroo-ga kesa ringo-o tabe]&[$_{VP}$ **dare-mo** sakuban

T.-Nom this:morning apple-Acc eat **who-MO** last:night

koohii-o nom-**ana**-katta].[7]

coffee-Acc drink-**Neg**-Past

'Taroo ate an apple this morning and nobody drank coffee last night.'

[7] Recall that I have been assuming that subjects do not have to raise to Spec,IP in Japanese. See Chapter 7.

b. **[$_{VP}$ … NCI …]&[$_{VP}$ …… Neg]*

*[$_{VP}$ **Dare-mo** kesa ringo-o tabe]&[$_{VP}$ Hanako-ga sakuban

who-MO this:morning apple-Acc eat H.-Nom last:night

koohii-o nom-**ana**-katta].

coffee-Acc drink-**Neg**-Past

'Anyone ate an apple this morning and Hanako didn't drink coffee last night.'

c. *ok*[$_{VP}$ … NCI … Neg]&[$_{VP}$ … NCI … Neg]*

[$_{VP}$ **Dare-mo** kesa ringo-o tabe-**zu**]&[$_{VP}$ **Dare-mo** sakuban

who-MO this:morning apple-Acc eat-**Neg** **who-MO** last:night

koohii-o nom-**ana**-katta].

coffee-Acc drink-**Neg**-Past

'Nobody ate an apple this morning and nobody drank coffee last night.'

d. *ok*NCI …… [$_{VP}$ …… Neg]&[$_{VP}$ …… Neg]*

Dare-mo [$_{VP}$ kesa ringo-o tabe-**zu**]&[$_{VP}$ sakuban koohii-o

who-MO this:morning apple-Acc eat-**Neg** last:night coffee-Acc

nom-**ana**-katta].

drink-**Neg**-Past

'Nobody ate an apple this morning or drank coffee last night.'

e. **NCI …… [$_{VP}$ …… Neg]&[$_{VP}$ ……]*

***Dare-mo**[$_{VP}$ kesa ringo-o tabe-**zu**]&[$_{VP}$ sakuban koohii-o
who-MO this:morning apple-Acc eat-**Neg** last:night coffee-Acc
non-da].
drink-Past
'Anybody didn't eat an apple this morning and drank coffee last night.'

The grammatical status of these examples conforms to generalization (24), and thus it seems safe to assume that it is valid.

4.3 Neg-raising and Last Resort

4.3.1 Neg-raising to license NCIs

Given the generalization we obtained in the last section, repeated below, a crucial observation is the following: When Neg appears on the final verb and an NCI appears above the coordinate structure, the sentence is acceptable, as illustrated by the examples in (31):[8]

(30) *Descriptive generalization I*

If a component structure of a sentence contains an NCI, it must also contain Neg.

[8] Notice the difference in meaning between (31a), (31b), and (31c), on the one hand, and (20a), (28d), and (29d), on the other. For example, even if Prof. Yamada praised John today, (31a) is true if he didn't scold John yesterday. In contrast, (20a) is false in the same situation.

(31) *Neg on the second verb*

a. **Dare-mo$_i$** Yamada kyoozyu-ga kyoo t_i home & kinoo t_i
who-MO Y. prof.-Nom today praise yesterday
sikar-**ana**-katta.
scold-**Neg**-Past
'Nobody is such that Prof. Yamada praised him today and scolded him yesterday.'

b. **Taroo-sika$_i$** Yamada kyoozyu-ga kyoo t_i home & kinoo t_i
T.-except Y. prof.-Nom today praise yesterday
sikar-**ana**-katta.
scold-**Neg**-Past
'Only Taroo is such that Prof. Yamada praised him today and scolded him yesterday.'

c. **Dare-mo** kesa ringo-o tabe & sakuban koohii-o
who-MO this:morning apple-Acc eat last:night coffee-Acc
nom-**ana**-katta.
drink-**Neg**-Past
'Nobody ate an apple this morning and drank coffee last night.'

Compare, for example, (31a) with (22), which is repeated below:

(32) *Neg on the first verb*

***Dare-mo$_i$** Yamada kyoozyu-ga[$_{VP}$ kyoo t_i home-**zu**]&[$_{VP}$ kinoo t_i

who-MO Y. prof.-Nom today praise-**Neg** yesterday

sikat-ta].

scold-Past

'Prof. Yamada didn't praise anyone today and scolded anyone yesterday.'

These examples are similar in that an NCI appears above the coordinate structure and only one of the conjuncts contains Neg. The only difference is that Neg appears on the second verb in (31a) and it appears on the first verb in (32). As seen above, the ungrammaticality of (32) is compatible with generalization (30): One of its component structures does not contain Neg, although it contains an NCI (see (27)). If this generalization is correct, however, the acceptability of (31a) indicates that the structure of this example is not as in (33), because if it were, one of its component structures would not contain Neg, and it would be unacceptable on a par with (32).

(33) *NCI …… [[……]&[…… Neg]]

Rather, the structure of (31a) should be like (34), where Neg appears in a position higher than the coordinate structure.

(34) *Structure of (31a)*

NCI …… [[……]&[……]] Neg

The two component structures obtained from (34) are like (35a) and (35b), and in each of these, the NCI co-occurs with Neg.

(35) *Component structures of (34)*

a. NCI …… [……] Neg

b. NCI …… [……] Neg

Recall at this point that when there is no NCI above the coordinate structure, as in (3), repeated below as (36), Neg cannot appear outside the coordinate structure.

(36) *No NCI above the coordinate structure*

Taroo-ga kesa ringo-o tabe & sakuban koohii-o nom-**ana**-katta.
T.-Nom this:morning apple-Acc eat last:night coffee-Acc drink-Neg-Past
= 'Taroo ate an apple this morning and didn't drink coffee last night.'

$(VP_1 \& \neg VP_2)$

≠ 'Taroo didn't eat an apple this morning and drink coffee last night.'

$(\neg(VP_1 \& VP_2))$

Thus, we can draw the following descriptive generalization:

(37) *Descriptive generalization II*

Neg can appear above a coordinated VP only when there is an NCI above the coordinated VP which needs to be licensed by the Neg.

Now, the question is: How can we capture this generalization most naturally? It should not be a good strategy to assume that the appearance of Neg above the coordinated VP is a result of base-generation, since this would make it much more difficult to explain why Neg cannot appear above the coordinated VP unless an NCI also appears there: It is quite

unlikely that the base-generated position of one element is affected by the existence of another.

My claim is that Neg is always base-generated within VP in Japanese, and that it may undergo raising in accordance with the familiar Last Resort principle in the Minimalist Program (cf. Chomsky 1995). In this analysis, Neg can raise out of the coordinated VP in the examples in (31), where an NCI appears above the coordinate structure, as a last resort to license the NCI, as shown below:

(38) *Neg-raising*

NCI …… [……]&[…… Neg]
|___↑

In this derivation, in the representation before Neg-raising occurs, the NCI is not licensed, but it gets licensed once Neg-raising occurs, and in this sense, this movement operation satisfies Last Resort. In contrast, in (36), where there is no NCI above the coordinated VP, Neg-raising is blocked by Last Resort, because there is no reason for it to take place. Thus, we can capture the generalization in (37).[9,10]

---

[9] The ungrammaticality of examples with the structure of (23e) shows that Neg-raising occurs overtly in Japanese, and this falls in line with the claim made by Ladusaw (1988) and McCloskey (1997) that covert Neg-raising does not exist (but see also Boeckx 2001). This point will be important in the next chapter.

[10] The following example is unacceptable:

(i) *Taroo-ga[$_{VP}$ kesa **nani-mo** tabe]&[$_{VP}$ sakuban **nani-mo**
T.-Nom this:morning **what-MO** eat last:night **what-MO**
nom-**ana**-katta].
drink-**Neg**-Past
'Taroo ate anything this morning and didn't drink anything last night.'

One might ask why this example cannot be saved by Neg-raising, which should derive the structure whose component structures are like (iia) and (iib) below:

4.3.2 Neg-raising to create new scope relations

The last resort nature of Neg-raising also manifests itself in another circumstance. Y. Kato (1988) observes that sentences such as (39), where the universal quantifier *zen'in* 'all' appears as a subject, allow for only total negation readings (see also Miyagawa 2001, 2003, 2005a).

(39) **Zen'in**-ga Taroo-o home-**na**-katta.
all-Nom T.-Acc praise-**Neg**-Past
'All didn't praise Taroo.'

However, in reality, partial negation readings ('It is not that all praised Taroo') are also possible for some speakers (see also Miyagawa 2005a: footnote 10). Crucially, these speakers accept the partial negation reading of the following example:

(40) **Zen'in**-ga kyoo Taroo-o home & kinoo Hanako-o sikar-**ana**-katta.
all-Nom today T.-Acc praise yesterday H.-Acc scold-**Neg**-Past
'All praised Taroo today and didn't scold Hanako yesterday.' (∀ > Neg)
'It is not that all praised Taroo today and scolded Hanako yesterday.' (Neg > ∀)

(ii) *Schematic component structures of (i) resulting from Neg-raising*
a. …… [… NCI …] Neg
b. …… [… NCI …] Neg

Obviously, these satisfy (37). I suggest that the unacceptability of (i) can be explained if we assume, following Giannakidou (2006), that NCIs must take scope over Neg in order to be licensed. In (iia) and (iib), the NCI appears lower than Neg, so that it fails to be licensed.

The availability of the partial negation reading indicates that Neg may appear higher than the subject quantifier, and this in turn entails that it may appear above the coordinate structure. Thus, the structure of (40) may be like the following:[11]

(41) *Schematic structure of (40) under the partial negation reading*

[all …… [$_{VP}$ ……]&[$_{VP}$ ……]]Neg

Adopting Fox's (1995, 2000) Scope Economy, which amounts to requiring that scope-shifting operations occur as a last resort to create new scope relations, I argue that in (40) Neg-raising may occur as a last resort to create the partial negation reading, which is unavailable before it occurs (for Scope Economy, see also Singh 2003).[12]

---

[11] Reconstruction of the subject quantifier to its VP-internal base positions cannot create a licit representation for the partial negation reading, because it would result in a representation like the following:

(i) … [$_{VP}$ all …]&[$_{VP}$ all … Neg]

Here, one occurrence of the universal quantifier fails to be under the scope of negation.

[12] One might ask why Scope Economy cannot license Neg-raising in (3)/(36). There, neither an NCI nor a quantifier appears above the coordinate structure, but Neg-raising could create a new scope relation between Neg and coordination (i.e. ¬(VP_1&VP_2)). I assume following Fox (2000: 48-49) that coordination is invisible to Scope Economy, so that this condition cannot be satisfied if a scope-shifting operation would result in a new scope relation with respect to coordination. Fox argues that the invisibility of coordination is derived from a condition like the following, which is adopted in the representational approach to the CSC:

(ii) A sentence with a coordinate structure is well-formed only if each of its component structures independently satisfies grammatical constraints.

As a grammatical constraint, Scope Economy should be satisfied in each component structure, but because component structures, by definition, do not contain coordinate structures, coordination is invisible to Scope Economy.

4.4 The Nature of the CSC

So far I have argued that Neg-raising may occur as a last resort in Japanese. For example, in sentence (31a), repeated here as (42), Neg moves out of the coordinated VP as a last resort to license the NCI.

(42) **Dare-mo$_i$** Yamada kyoozyu-ga kyoo t_i home & kinoo t_i sikar-**ana**-katta.
who-MO Y. prof.-Nom today praise yesterday scold-**Neg**-Past
'Nobody is such that Prof. Yamada praised him today and scolded him yesterday.'

In the above discussion, I have assumed implicitly that the launching site of the Neg-raising in this sentence is within the final conjunct. Namely, the Neg-raising has been assumed to take place as follows:

(43) *Neg-raising from the second conjunct*

NCI …… [……]&[…… Neg]
|___↑

Now, let us consider another imaginable derivation of (42), which is shown in (44).

(44) *Imaginable derivation of (42): ATB Neg-raising*

NCI …… […… Neg]&[…… Neg]
|_____|___↑

Here, Neg raises from both conjuncts in an ATB fashion. If my argument in the last section is on the right track, this derivation should be blocked by Last Resort. This is so

because, if the underlying structure of (42) contained two Neg's as in (44), the NCI could be licensed without Neg-raising, as shown by the acceptability of (20a), repeated below:

(45) **Dare-mo$_i$** Yamada kyoozyu-ga[$_{VP}$ kyoo t_i home-**zu**]&[$_{VP}$ kinoo t_i
who-MO Y. prof.-Nom today praise-**Neg** yesterday
sikar-**ana**-katta].
scold-**Neg**-Past
'Prof. Yamada praised nobody today and scolded nobody yesterday.'

Because there is no motivation for Neg-raising in the derivation in (44), this operation should be blocked by Last Resort.

Having excluded the possibility of (44), we can conclude that (43) is the only possible derivation for (42). However, this conclusion has an important implication for the nature of the CSC. Recall that in Chapter 2, we saw two possible approaches to this constraint: the derivational approach and the representational approach.[13] Under the first approach, the CSC is viewed as a derivational constraint which bans non-ATB extraction from a coordinate structure. The fact that Neg-raising as in (43) is allowed shows that this view is not tenable.

In contrast, under the representational approach, where CSC effects are derived from the assumptions in (46), Neg-raising as in (43) is permitted.

[13] I defer discussion on a PF approach to the CSC until Chapter 5.

(46) *LF Representational CSC*

a. A sentence with a coordinate structure is well-formed only if each of its component structures independently satisfies grammatical constraints.

b. Component structures of a sentence with a coordinate structure $=_{def}$ structures each of which is composed of one of the conjuncts together with the material which is not included by the coordinate structure.

The LF representations of the component structures of sentence (42), with Neg-raising as in (43), are like (47a) and (47b), where no grammatical constraints seem to be violated.[14]

(47) *Component structures of (42)*

a. **Dare-mo$_i$** Yamada kyoozyu-ga [$_{VP}$ kyoo t_i home] **ana**-katta.
who-MO Y. prof.-Nom today praise **Neg**-Past

b. **Dare-mo$_i$** Yamada kyoozyu-ga [$_{VP}$ kinoo t_i sikar] **ana**-katta.
who-MO Y. prof.-Nom yesterday scold **Neg**-Past

Because only the representational approach allows for the derivation which should be allowed, the discussion on Neg-raising provides further support for this approach.

[14] One thing we have to make sure is that Neg-raising does not create an operator-variable chain. Otherwise, it would result in a violation of the ban on vacuous quantification in one of the component structures of the sentence (recall that CSC effects of *wh*-movement are attributed to violations of the ban on vacuous quantification by the Representational CSC (see section 2.1 of Chapter 2)).

4.5 Summary

To sum up, it has been demonstrated in this chapter that Japanese has the operation of Neg-raising and that it occurs as a last resort to license an NCI or create a new scope relation. It has also been argued that this last resort nature of Neg-raising lends further support to the representational approach to the CSC.

Chapter 5
Against a PF Approach to the CSC

In Chapters 2 and 4, I compared the derivational approach and the LF representational approach to the CSC, arguing that the latter is superior. However, when we consider the nature of island/locality effects on movement, these two approaches are not the only theoretical possibilities in recent years: An increasing number of current works suggest that those effects should be viewed as PF phenomena (e.g., Bošković 2002, Kasai and Takahashi 2001, Lasnik 2000, Merchant 2001, Pesetsky 1997, 1998; see also Perlmutter 1972). In the presence of such works, there is another possibility to consider about the nature of the CSC, that is, that the constraint is a PF constraint and as such applies at the PF interface. The goal of this chapter is to argue that the PF approach is not successful, and CSC effects should not be dealt with in phonological terms. In what follows, after giving a concrete formulation of the PF account of CSC effects, I first point out several empirical problems with this line of approach, and then examine some data which appear to be explained under the PF approach but not under the LF approach, claiming that they pose no real problem for the latter approach.

5.1 A PF Approach to the CSC

To the best of my knowledge, no one has explicitly formulated a PF account of CSC effects. For the sake of discussion, here I assume that in the PF approach, CSC effects are derived from the following condition:

(1) *The CSC at PF*

*α … [$_{\text{conjunct}}$ … β …], where β is a trace of α and unpronounced.

This condition is modeled on the more general constraint in (2), which is proposed in Pesetsky 1998 to explain island effects in phonological terms.

(2) *Island constraints (Pesetsky 1998: 365)*

*α … [$_{\text{island}}$ … β …], where β is a trace of α and unpronounced.[1]

The condition in (1) correctly rules out example (3) below, a typical example of CSC effects, where one of the conjuncts contains an unpronounced copy of the moved phrase.

(3) *What did Mary [send *t* on Monday] and [receive the parcel on Wednesday]?

[1] This PF approach to islandhood amounts to claiming that pronouncing a copy of a moved phrase in an island nullifies the island (for similar approaches, see Bošković 2002, Perlmutter 1972). It is argued to receive support from the well-known fact that a resumptive pronoun can save a locality violation in a number of languages (e.g., Arabic, English, Hebrew, and English; cf. Pesetsky 1997, 1998, Shlonsky 1992, among others), which can be captured by the condition in (2) on the assumption that a resumptive pronoun is a pronounced copy of a moved element. However, as pointed out to me by Cedric Boeckx (personal communication), this approach to islandhood faces a problem when we consider the observation made by researchers like Georgopoulos (1991) and McCloskey (1990, 2002) that a resumptive pronoun can save a locality violation even if phonologically null. In Kato 2004, I provide another empirical argument against the approach. See also Boeckx 2003b.

However, an obvious problem with condition (1) is that, as it is, it fails to allow for ATB-movement, a well-known exception to the CSC. For example, in the following flawless sentence, both of the conjuncts contain an unpronounced copy of the moved phrase, violating the above condition (doubly):

(4) What did Mary [send *t* on Monday] and [receive *t* on Wednesday]?

In order to avoid this problem, it seems that the PF approach needs to be supplemented with a subsidiary condition like the following:

(5) *Exceptionality of ATB movement to the CSC*

Extraction out of a coordinate structure is permitted if all the conjuncts contain an unpronounced copy of the moved phrase.

This condition might be derived from a more general principle, but I do not discuss this issue, since it is irrelevant for our present purposes.

In the next section, I show that the PF approach to the CSC with conditions (1) and (5) faces some empirical problems.

5.2 Empirical Problems

Potentially, evidence against the PF approach comes from two directions. The first type of such evidence may come from cases in which no overt movement occurs but a CSC effect is detected. The second type may come from cases where not all conjuncts contain an unpronounced copy of an overtly moved phrase but no CSC effect is detected. Both of these two types of evidence can be found.

5.2.1 "No overt movement but a CSC effect" cases

5.2.1.1 Wh-in-situ

As seen in section 2.2.1 of Chapter 2, *wh*-in-situ exhibits CSC effects, which is illustrated by the following example:

(6) *I wonder who [took **what** from Mary] and [gave a book to Fred].

The PF approach cannot account for the ungrammaticality of this example, because neither conjunct contains a trace.[2]

As discussed in Chapter 2, the LF approach which requires that each component structure of a sentence must satisfy grammatical constraints independently can deal with examples like this, since the covert movement of the in-situ *wh*-phrase results in vacuous quantification in one of the component structures.

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[2] Japanese *wh*-in-situ also exhibits CSC effects (cf. Kato 2006, Tokashiki 1989; see Yoon 1994, 1997 for Korean):

(i) *Watasi-wa [Yamada kyoozyu-ga [kesa **nani-o** tabe]&[sakuban koohii-o non-da] ka] sitteiru.
I-Top Y. prof.-Nom this:morning **what-Acc** eat last:night coffee-Acc drink-Past Q know
'I know [Q Prof. Yamada [ate what this morning] and [drank coffee last night]].'

However, this fact is not necessarily problematic for the PF approach, if Japanese *wh*-in-situ is licensed through overt movement of a null operator (Watanabe 1992a, b) or a question particle (Hagstrom 1998), as will be argued in Chapter 6.
When each conjunct contains an in-situ *wh*-phrase, the example is unacceptable in English (Bošković and Franks 2000), but acceptable in Japanese (Kato 2006; Yoon 1994, 1997):

(ii) *Who said [that John bought **what**] and [that Peter sold **what**]?

(iii) Watasi-wa [John-ga [kesa **nani-o** tabe] &[sakuban **nani-o** nonda] ka] sitteiru.
I-Top J.-Nom this:morning **what-Acc** eat last:night **what-Acc** drank Q know
'I know [Q John ate what this morning and drank what last night].'

See Chapter 6 for an explanation of this contrast.

5.2.1.2 QR

For the same reason, the PF approach cannot deal with the fact that QR exhibits CSC effects, as also seen in section 2.2.1 of Chapter 2. The relevant example is repeated below:

(7) A (#different) student [likes **every professor**] and [hates the dean]. (**every* > *a*)

Here, the universal quantifier in the first conjunct cannot take wide scope over the existential quantifier in the subject position. Because neither conjunct contains an unpronounced copy of a moved phrase, the PF approach to the CSC has nothing to say about the unavailability of the inverse scope in this example.

Since the QR of the universal quantifier induces a violation of the ban on vacuous quantification in one of the component structures of the example, the above fact can be explained by the LF approach to the CSC.

5.2.1.3 Japanese topic and relative clause constructions

Although in the cases seen above, covert movements induce CSC effects, such effects can also be detected even where no movement, overt or covert, takes place. Cases in point are provided by Japanese topic and relative clause constructions, as discussed in section 2.2.3 of Chapter 2. We saw that although those constructions are licensed through "aboutness relations" and do not involve movement, they exhibit CSC effects. Some of the relevant examples are reproduced below:

(8) a. *Topic sentence*

*Taroo$_i$-wa [Yamada kyoozyu-ga[*pro*$_i$ home]&[Hanako-o sikatta]].

T.-Top Y. prof.-Nom praise H.-Acc scolded

'Speaking of Taroo, Prof. Yamada praised him and scolded Hanako.'

b. *Relative clause*

*[Yamada kyoozyu-ga[*pro*$_i$ home]&[Hanako-o sikatta]] gakusei$_i$

Y. prof.-Nom praise H.-Acc scolded student

'the student who Prof. Yamada praised and scolded Hanako'

(9) *Gapless topic sentences*

a. *Sakana-wa [[tai-ga oisiku]&[retasu-ga mazui]].

fish-Top red:snapper-Nom tasty lettuce-Nom is:nasty

'Speaking of fish, red-snapper is tasty and lettuce is nasty.'

b. (Situation: only Taroo (or Hanako) is pesent and looks depressed)[3]

*Are-wa zettaini [[Taroo-ga siken-ni oti]&[Hanako-ga sensei-ni

that-Top absolutely T.-Nom exam-Dat fail H.-Nom teacher-by

sikarareta]].

was:scolded

(Lit.) 'Speaking of that (situation), absolutely Taroo failed the exam and Hanako was scolded by her teacher.'

[3] In a situation where both Taroo and Hanako are present and look depressed, the example is acceptable.

(10) *Gapless relative clauses*

a. *[Taroo-ga [syuusyoku-ga muzukasii to ii]&[Yamada kyoozyu-no
T.-Nom getting:job-Nom is:hard C say Y. prof.-Gen
kagaku-no zyugyoo-ga tumaranai to omotta]] buturigaku
chemistry-Gen class-Nom is:boring C thought physics
'physics, which Taroo said is hard to get a job in and thought Prof. Yamada's class of chemistry is boring'

b. *[Taroo-ga [hon-o yaburi]&[enpitu-o kau]] oto
T.-Nom book-Acc break pencil-Acc buy sound
'the sound of Taroo breaking a book and buying a pencil'

In (8a) and (8b), examples of the topic and relative clause constructions, respectively, there is a gap in the first conjunct, but as discussed in Chapter 2, it is not occupied by a trace of any moved phrase, but a null pronoun (*pro*). Thus, the ill-formedness of those examples is problematic for the PF approach to the CSC. The examples in (9) and (10) show that gapless topic and gapless relative clause constructions also exhibit CSC effects, and this also poses a problem for the PF approach, which might be more serious.

We saw in Chapter 2 that the LF representational approach to the CSC can deal with the unacceptability of the above examples: In one of their component structures, the aboutness condition is not met.

5.2.1.4 The CSC as an "overarching" constraint

Given the counterevidence to the PF approach seen so far, one might suggest that the CSC should be viewed as a sort of "overarching" constraint which applies at both the PF and LF interfaces (Naoki Fukui, personal communication). Although it is not very clear how to situate such an overarching constraint in the current theorization, it seems possible to discuss its consequences by regarding it as consisting of two parts, the part which is operative at LF and the part which is operative at PF, and taking its effects to be the sum of those of the two parts.[4] Thus, just for the sake of discussion, below I simply assume that the overarching CSC is the combination of the LF (Representational) CSC, which has been defended in this work, and the PF CSC, which is characterized by the conditions in (1) and (5) above:

(11) Overarching CSC = LF CSC + PF CSC

Under this overarching CSC hypothesis, the CSC effects discussed in the last three subsections, namely the CSC effects obtained when no overt movement takes place, are captured by the LF CSC part, and the CSC effect in (3), repeated below as (12), is explained by both the LF and the PF CSC part.[5]

(12) *What did Mary [send *t* on Monday] and [receive the parcel on Wednesday]?

[4] Cedric Boeckx (personal communication) pointed out to me that one possible way of making sense of such an overarching constraint is to adopt "Single Output Syntax," where the computational system derives a single representation which is interpreted by both the LF and PF interfaces (cf., e.g., Bobaljik 1995, 2002, Groat and O'Neil 1996, Brody 1995).

[5] This redundancy in the explanation of examples like (3) might cast an initial doubt on the overarching CSC.

A merit of the overarching CSC is that, faced with the observation that Japanese scrambling exhibits CSC effects, we do not have to conclude that it cannot undergo total reconstruction, as we did in Chapter 3. One of the examples showing the CSC effect with Japanese scrambling was the following:

(13) *CSC effect with scrambling*

*Hanako-o_i Yamada kyoozyu-ga [$_{VP}$ Taroo-o home]&[$_{VP}$ t_i sikatta].

H.-Acc Y. prof.-Nom T.-Acc praise scolded

'Hanako, Prof. Yamada praised Taroo and scolded.'

If total reconstruction of the scrambled phrase were possible, the LF representation of this example would be as in (14), and the LF Representational CSC could not predict its unacceptability, because neither of the component structures violates any grammatical constraints.

(14) *LF representation of (13) under the total reconstruction hypothesis*

Yamada kyoozyu-ga [$_{VP}$ Taroo-o home]&[$_{VP}$ Hanako-o_i sikatta].

Thus, we concluded that Japanese scrambling cannot undergo total reconstruction. However, under the overarching CSC hypothesis, it is possible to say that the CSC effects of Japanese scrambling are PF CSC effects: Example (13) is ungrammatical because (only) one of its conjuncts contains an unpronounced copy of the scrambled phrase. This explanation holds whether the scrambled phrase may be totally reconstructed at LF or not. Therefore, we can maintain the total reconstruction property of Japanese scrambling under the overarching CSC hypothesis.

With the possibility of the overarching CSC in mind, let us move on to the second type of counterevidence to the PF approach, or cases where not all conjuncts contain an unpronounced copy of an overtly moved phrase but no CSC effect is detected.

5.2.2 "Non-ATB distribution of traces but no CSC effect" cases

5.2.2.1 English Gapping sentences

As seen in section 2.2.2 of Chapter 2, in English Gapping sentences like (15), the subject in the first conjunct undergoes non-ATB raising to Spec,IP (as shown in (16)), but this does not result in inducing a CSC effect.

(15) *Gapping*

Bob dusted the bookcase and Mary, the windowsill.

(16) *Johnson's (1996) analysis of Gapping*

$[_{IP}\ Bob_i\ dusted_j\ [[_{VP}\ t_i\ t_j$ the bookcase] and $[_{VP}$ Mary t_j the windowsill]]]

Not only the PF approach but also the overarching CSC wrongly predicts that (15) exhibits a CSC effect. This is because in the PF representation of this sentence, only the first VP conjunct contains an unpronounced copy of the raised subject.

As discussed in Chapter 2, the non-ATB movement of the first subject in (15) does not lead to a violation of the LF Representational CSC, because the raised subject undergoes LF (total) reconstruction and no grammatical constraints (especially, the Theta-Criterion) are violated in the resulting component structures.

5.2.2.2 Japanese Neg-raising

We saw in Chapter 4 that in Japanese sentences like (17), the negative marker (Neg) raises from the second conjunct to a position outside the coordinated VP as a last resort to license the negative concord item (NCI) appearing above the coordinate structure, as shown in (18) (recall that if a component structure contains an NCI, it must also contain Neg).

(17) **Dare-mo$_i$** Yamada kyoozyu-ga kyoo t_i home & kinoo t_i sikar-**ana**-katta.
who-MO Y. prof.-Nom today praise yesterday scold-**Neg**-Past
'Nobody is such that Prof. Yamada praised him today and scolded him yesterday.'

(18) NCI …… [……]&[…… Neg]
|___↑

There are two reasons to suppose that the Neg-raising in (17) takes place overtly. First, the existence of covert scope-enhancing movement for negation is independently questioned by researchers such as Ladusaw (1988) and McCloskey (1997) (but see also Boeckx 2001 for the opposite view). For example, consider the following sentences, which are scopally unambiguous:

(19) a. A Fiat necessarily isn't reliable.
b. Shelly usually doesn't do her homework. (Ladusaw 1977)

If covert Neg-raising were available, it would allow negation in these sentences to appear above the adverb at LF and have wider scope.

The contrast between the following examples makes the same point:

(20) a. Which of the kids doesn't anyone like?

b. *Which of the kids does anyone not like? (McCloskey 1997)

If there are no S-structure principles (Chomsky 1993, 1995), the licensing mechanism for negative polarity items must be an LF condition. If so, however, the grammatical status of (20b) indicates that negation cannot move across the subject negative polarity item covertly: Otherwise, this example should show no relevant difference from (20a) at LF and be acceptable on a par with the latter.

The second reason to suppose that the Neg raising in (17) takes place overtly comes from the fact that the following example, which is identical to (17) except that Neg appears on the first verb rather than the second verb, is unacceptable:

(21) ***Dare-mo**$_i$ Yamada kyoozyu-ga[$_{VP}$ kyoo t_i home-**zu**]&[$_{VP}$ kinoo t_i

who-MO Y. prof.-Nom today praise-**Neg** yesterday

sikat-ta].

scold-Past

'Prof. Yamada didn't praise anyone today and scolded anyone yesterday.'

If Neg raised covertly in Japanese, this example could have LF representation (22), where the Neg co-occurs with the NCI in each component structure, so that (21) should be acceptable on a par with (17), but this is not the case.

(22) NCI …… […… *t*]&[……] Neg

|_____↑

Obviously, the overt non-ATB Neg-raising in (17) poses a problem for both the PF approach to the CSC and the overarching CSC. Because it leaves a trace, or an unpronounced copy, within the second conjunct, these two approaches wrongly rule it out. In contrast, as discussed in Chapter 4, the LF Representational CSC allows for such Neg-raising: On the assumption that it does not create an operator-variable chain, it causes no violations of any grammatical constraints in any of the component structures.

5.2.2.3 Resumptive pronouns

So far we have seen that non-ATB overt movements do not always lead to CSC effects and that this is a problem for the PF approach to the CSC and the overarching CSC, which predict that such movements necessarily result in CSC effects. What is worse for those approaches, we can find yet another type of case where not all conjuncts contain an unpronounced copy of an overtly moved phrase but no CSC effect is detected.

In languages with (true) resumptive pronouns, it is possible that one of the launching sites of an ATB movement is occupied by a resumptive pronoun and the other launching site is occupied by a trace. Witness the examples in (23), (24), and (25) below, which are from Swedish, Palauan, and Hebrew, respectively.

(23) *Swedish*

Där borta går en man$_i$ som jag ofta träffar $\boldsymbol{t_i}$ men inte minns vad
there goes a man that I often meet but don't remember what
han$_i$ heter.
he called (Zaenen et al. 1981: 681)

(24) *Palauan*

ng- ngera$_i$ [mirruul er **ngii$_i$** a Sie] e [a ?o?od -al a me?er -ar ***t*$_i$**][6]

CL what R-IM-make P **it** S. and sister 3s R-PF-buy 3s

'What did Sie make and her sister buy?' (Georgopoulos 1985: 88)

(25) *Hebrew*

a. ha'iš še$_i$ rina [$_{VP}$ roca ***t*$_i$**] ve [$_{VP}$ ohevet **oto$_i$** yoter mikulam]

the:man who Rina wants and loves **him** more:than anyone

b. kol profesor še$_i$ dani [$_{VP}$ roce lehazmin ***t*$_i$**] aval [$_{VP}$ lo maarix **oto$_i$** maspik]

every professor who Dani wants to:invite but not esteems **him** enough

(Sells 1984: 78)

Suppose resumptive pronouns are phonologically realized copies of moved elements (cf. Bošković 2002, Grohmann 2003, Perlmutter 1972, Pesetsky 1997, 1998, among others).[7] Then, the above sentences give rise to a problem for the PF CSC and the overarching

[6] CL = cleft, IM = imperfective, P = preposition, PF = perfective, R = realis

[7] Although Boeckx (2003b) argues that this assumption is not quite right, at least under the PF approach to the CSC being considered here (and the overarching CSC, which virtually contains it), it should be plausible. Recall that this approach relies on the condition in (1), repeated below as (i), and that this condition is a subcase of the more general condition in (2), repeated below as (ii).

(i) *The CSC at PF*
*α … [$_{conjunct}$ … β …], where β is a trace of α and unpronounced.

(ii) *Island constraints (Pesetsky 1998: 365)*
*α … [$_{island}$ … β …], where β is a trace of α and unpronounced.

As mentioned in footnote 1, condition (ii) is argued to be supported by the fact the resumptive pronouns can remedy island violations in a number of languages, which can be captured by that condition on the assumption that a resumptive pronoun is a pronounced copy of a moved element.

CSC: They are wrongly predicted to be ungrammatical under those approaches, which rule out PF representations in which only one of the conjuncts contain an unpronounced copy of a moved element.

In contrast, the LF Representational CSC can deal with the above sentences with no problem. For example, the component structures of (24) are (26a) and (26b) below, where no grammatical constraints (for example, the ban on vacuous quantification) are violated.

(26) *Component structures of (24)*

a. ng- ngera$_i$ [mirruul er **ngii$_i$** a Sie]
   CL what R-IM-make P **it** S.

b. ng- ngera$_i$ [a ?o?od -al a me?er -ar ***t*$_i$**]
   CL what sister 3s R-PF-buy 3s

5.2.3 Summary

To sum up the discussion so far, we have seen that the PF approach to the CSC, which is based on the assumptions in (1) and (5), repeated below as (27) and (28), respectively, has several empirical problems.

(27) *The CSC at PF*

*α … [$_{conjunct}$ … β …], where β is a trace of α and unpronounced.

(28) *Exceptionality of ATB movement to the CSC*

Extraction out of a coordinate structure is permitted if all the conjuncts contain an unpronounced copy of the moved phrase.

These problems can be classified into two groups: The first group arises from cases where no overt movement occurs but a CSC effect is detected and the second group arises from cases where not all conjuncts contain an unpronounced copy of a moved element but no CSC effect is detected. Because none of these cases gives rise to a problem for the LF approach, this approach is more plausible. Moreover, the second group of the problems for the PF approach is also problematic for the overarching CSC, which can virtually be considered to be the combination of the PF approach and the LF approach. As discussed in section 5.2.1.4 above, the overarching CSC, if on the right track, could enable us to maintain the total reconstruction hypothesis on Japanese scrambling. Thus, the fact that it bears problems which do not arise in the LF approach reinforces our conclusion in Chapter 3 that Japanese scrambling cannot undergo total reconstruction.

5.3 Apparent Arguments for the PF Approach

Although we have seen in the preceding section that the PF approach to the CSC has several empirical problems, there are some data which appear to be explained under the PF approach but not under the LF approach. In this section, I examine such data and show that they pose no real problem for the latter approach.

5.3.1 Repair under Sluicing

One argument which appears to favor the PF approach concerns Sluicing. It is observed that CSC violations are repaired under Sluicing (for island repair under Sluicing, see Fox and Lasnik 2003, Merchant 2001, Ross 1969, and references cited therein). Compare the examples in (29) and those in (30) below.

(29) a. ??Which movie did Bob eat dinner and see *t* that night?

b. *How many movies did Bob eat dinner and see *t* that night?

c. *How expensive a dinner did Bob see a movie and eat *t* that night?

(Merchant 2001: 223)

(30) *"CSC repair under Sluicing"*

a. Bob ate dinner and saw a movie that night, but he didn't say which.

b. Bob ate dinner and saw a couple of movies that night, but he didn't say how many.

c. Bob saw a movie and ate an expensive dinner that night, but he didn't say how expensive.

(Merchant 2001: 223)

Let us assume that Sluicing is a PF phenomenon. Then, it appears that the above contrast cannot be dealt with by the LF approach, since the LF representation of, say, (30a) is like (31) and the deletion of the underscored part at PF should not be able to have any effect on it.

(31) *Apparent LF representation of (30a)*

Bob ate dinner and saw a movie that night, but he didn't say which <u>he ate dinner and saw *t* that night</u>

In contrast, there is room for an explanation in the PF approach. For example, one might assume that Sluicing "gets rid of" the offending trace by deleting the part of the sentence which contains it.

This argument does not hold water, because as Merchant (2001: 223ff.) argues, the deleted parts of the sentences in (30) do not need to involve coordinate structures (see Merchant 2001 for discussion). More specifically, the LF representation of (30a) may be like (32), rather than (31) (again, the part of the sentence which is deleted at PF is underscored).

(32) *Possible LF representation of (30a)*

Bob ate dinner and saw a movie that night, but he didn't say which <u>he saw *t* that night</u>

This representation does not involve coordination, so that the application of the *wh*-movement should bear no relation to the CSC. Thus, as far as this line of analysis is tenable, the grammatical status of examples as in (30) tells us nothing about the constraint.

5.3.2 Topicalization vs. left dislocation

Another class of apparent arguments for the PF approach to the CSC concerns topicalization and left dislocation. In what follows, I assume that in a sentence with topicalization like (33a), the topicalized phrase appears in the surface position as a result of movement from the gap position, and that in a sentence with left dislocation like (33b), the left dislocated phrase is base-generated in the surface position and licensed by binding the co-indexed pronoun.

(33) a. *Topicalization*

That book$_i$, John bought t_i yesterday.

b. *Left dislocation*

That book$_i$, John bought it$_i$ yesterday.

I further assume (tentatively, especially for left dislocation) that the dependency between the topicalized/left dislocated phrase and the trace/pronoun counts as an operator-variable chain. However, all these assumptions are totally for the sake of discussion and no part of our discussion below depends on them in any substantial way.

5.3.2.1 Lasnik's data

Howard Lasnik (personal communication) pointed out that a contrast exhibited by the following pair of examples between topicalization and left dislocation favors the PF approach over the LF approach:

(34) *Contrast between topicalization and left dislocation*

a. ?*That boy$_i$, the dog bit t_i this morning and chased Bill last night.

b. ?(?)That boy$_i$, the dog bit him$_i$ this morning and chased Bill last night.

For more than half of the nine English speakers I consulted, (34b) is better than (34a). Because the surface difference between these examples is that (34a) contains a gap position in one of its conjuncts, while (34b) contains no gap position, the above contrast appears to be what the PF approach predicts. On the other hand, the LF approach appears to predict that both of the examples are equally ungrammatical, given the following component structures for them:

(35) *Apparent component structures of (34a)*

a. That boy$_i$, the dog bit t_i this morning.

b. That boy$_i$, the dog chased Bill last night.

(36) *Apparent component structures of (34b)*

a. That boy$_i$, the dog bit him$_i$ this morning.

b. That boy$_i$, the dog chased Bill last night.

In (35b) and (36b), the topicalized/left dislocated phrase fails to bind a variable, in violation of the ban on vacuous quantification. Thus, the contrast between (34a) and (34b) appears to support the PF approach.

However, this argument is not quite convincing. First, (34b) is still worse than sentences with ATB topicalization/left dislocation, examples of which are given in (37). This seems to show that a CSC effect is still there.

(37) *ATB topicalization/left dislocation*

a. That boy$_i$, the dog bit t_i this morning and chased t_i last night.

b. That boy$_i$, the dog bit him$_i$ this morning and chased him$_i$ last night.

Furthermore, ameliorating effects with an overt pronoun are not observed when a topicalized/left dislocated phrase is associated with a gap/pronoun in the second conjunct:

(38) *Topicalization/left dislocation from the second conjunct*

a. *That boy$_i$, the dog bit Bill this morning and chased t_i last night.

b. *That boy$_i$, the dog bit Bill this morning and chased him$_i$ last night.

Unlike (34b), where the left dislocated phrase is associated with a pronoun in the first conjunct, (38b) is flatly out, and this ungrammaticality cannot be accounted for under the PF approach. It is also interesting to note in this connection that some speakers judge (34a), a sentence with topicalization from the first conjunct, to be better than (38a), a sentence with topicalization from the second conjunct.

My conjecture is that the following structure is marginally available to (34a, b):

(39) *Possible structure of (34a, b)*

[That boy$_i$, the dog$_j$ bit him$_i$/t_i this morning] and [e_j chased Bill last night]

Here, two sentence-level constituents are conjoined, *that boy* is contained in the first conjunct, and the subject position in the second conjunct is a gap. I speculate that for some unknown reasons, (34b) (left dislocation) is easier to be analyzed with the above structure than (34a) (topicalization), and this is why the former tends to be judged better. If this analysis is on the right track, the contrast between those two examples gives no

support to the PF approach: the CSC, however formulated, is not violated in the structure in (39).

As just mentioned, the subject of the second conjunct in (39) is not phonologically realized. The availability of such a phonologically null subject in English in the context of coordination seems to be independently supported.[8] Consider the following example:

(40) ??Different horses can run very fast, and will win the race.

(sentence-internal reading of *different*, Carlson 1987: 549)

As discussed in section 1.4 of Chapter 1, *different* has at least two possible readings: a sentence-internal reading and a sentence-external reading. So, for example, if example (41) below is interpreted sentence-externally, it means that the classes Bob and Alice attend are different from the classes which have already been contextually defined, whereas if it is interpreted sentence-internally, it means that the class Bob attends is different from the class Alice attends:

(41) Bob and Alice attend different classes.

Recall that a sentence-internal reading of *different* can only be licensed when the sentence denotes a plural eventuality (see section 1.4 of Chapter 1). The fact that *different* cannot be interpreted sentence-internally in (40) indicates that this sentence should be analyzed as (42a), rather than (42b) (cf. Carlson 1987: 549).

[8] I do not discuss whether the null subject in question is a null pronoun (i.e. *pro*) or a deleted nominal phrase. See te Velde 2006: 185-6 for data pointing to the latter.

(42) a. *Correct structure of (40)*

[[Different horses$_i$ can run very fast] and [e_i will win the race]]

b. *Apparent structure of (40)*

[Different horses [[can run very fast] and [will win the race]]]

In (42b), *different horses* is a subject of a clause denoting a plural eventuality, while in (42a), it is a subject of a clause denoting a singular eventuality. Note that the subject of the second conjunct is not phonologically realized in (42a).

Further evidence for null subjects in the second conjunct of a coordinate structure comes from sentences like the following:

(43) In the summer Bill really prefers tacos and will usually eat them every day in the fall. (te Velde 2006: 230)

Because of the two contrasting temporal adverbials, *in the summer* and *in the fall*, this sentence has to be analyzed as in (44a), rather than (44b), where the sentence-initial adverbial has scope over both conjuncts.

(44) a. *Correct structure of (43)*

[In the summer Bill$_i$ really prefers tacos] and [e_i will usually eat them every day in the fall]

b. *Apparent structure of (43)*

In the summer Bill [really prefers tacos] and [will usually eat them every day in the fall]

To summarize the discussion, I have suggested the possibility that what differentiates topicalization and left dislocation that results in the contrast in (34) for some speakers is not their sensitivity to the CSC, but their amenability to the structural analysis in which two clause-level constituents are conjoined, so that the sentence-initial phrase is contained in the first conjunct, as seen in (39).

5.3.2.2 Ross's data

The observation that left dislocation, as opposed to topicalization, is insensitive to the CSC goes back to Ross 1967. The data Ross gives are the following:[9]

(45) *"Insensitivity of left dislocation to the CSC"*

a. This guitar$_i$, I've sung folksongs and accompanied myself on it$_i$ all my life.

b. Poor Jonesy$_i$, it had started to rain and he$_i$ had no umbrella.

(Ross 1986 [1967]: 256)

Note that unlike the (apparently) problematic examples we have examined in the preceding subsection, the left dislocated phrase in these examples is associated with a pronoun in the second conjunct. Thus, they appear to pose new problems for the LF approach. Below, I argue that the problems are, again, only apparent.

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[9] He also gives the following example:

(i) My father$_i$, I hardly ever see him$_i$ and my mother when they're not glaring at each other.

However, this example is irrelevant to discussion on the CSC in our sense. Recall from section 1.3.1 of Chapter 1 that Ross's original formulation of the CSC consists of two parts: the "no extraction *of* conjuncts" part and the "no extraction *out of* conjuncts" part. Although the above example might need to be taken into account when you discuss the first part, it has nothing to do with the second part, which is our concern in this work.

Let us first consider (45a). This example does not help us to choose between the LF approach and the PF approach, because the coordination involved is the one which fails to exhibit CSC effects. Thus, as the following example shows, extraction from the position of the pronoun in (45a) is possible:

(46) (?)Which guitar have you sung folksongs and accompanied yourself on *t* all your life?

Possibly, the insensitivity of (45a) and (46) to the CSC stems from the asymmetrical nature of the coordination involved (see section 1.3.3 of Chapter 1), but whatever the correct explanation turns out to be, (45a) fails to play any part in our discussion of the relative merits of the approaches to the CSC being considered here.

Let us turn to (45b). This example is also not a problem for the LF approach, because licensing of the sentence-initial phrase *poor Jonesy* does not depend on the existence of the co-indexed pronoun. Observe that the following example is acceptable under appropriate contexts:

(47) (Context: Jonesy went to school without his umbrella)

Poor Jonesy, it had started to rain before the class ended.

Now consider the component structures of (45b), given below:

(48) *Component structures of (45b)*

a. Poor Jonesy$_i$, it had started to rain.

b. Poor Jonesy$_i$, he had no umbrella.

Although *poor Jonesy* does not bind a pronoun in (48a), the acceptability of (47) shows that this does not lead to violating any grammatical constraints. Since both of its component structures are well-formed, the LF Representational CSC correctly predicts that (45b) is grammatical. I speculate that the sentence-initial phrase in (45b) and (47) is a sort of vocative phrase, so that it can be licensed without being related to any other element in the sentence.

5.3.3 Summary

We have seen in this section that although there are several apparent arguments in favor of the PF approach over the LF approach, none of them is convincing. In view of the presence of the empirical problems with the PF approach discussed in the last section, it seems safe to conclude that the LF view of the CSC is more plausible.

Chapter 6
ATB Distribution of In-situ *Wh*-phrases

6.1 Issue

We saw in sections 2.2.1 of Chapter 2 and 5.2.1.1 of Chapter 5 that English *wh*-in-situ exhibits CSC effects. This is illustrated by example (1).

(1) *Who said [that John bought **what**] and [that Peter sold a house]?

Example (2) shows that Japanese *wh*-in-situ also exhibits CSC effects (cf. Kato 2006, Tokashiki 1989; see Yoon 1994, 1997, for Korean).[1]

[1] In a footnote of Kato 2006, I report that speakers' judgments of the following example vary from "ok" to "??":

(i) Watasi-wa [$_{CP}$ betubetuno kyoozyu-ga [$_{VP}$ **dare-o** home]&[$_{VP}$ Taroo-o sikatta] ka] sitteiru.
I-Top different prof.-Nom **who-Acc** praise T.-Acc scolded Q know
'I know [Q different professors praised who and scolded Taroo].'

Yoshihisa Kitagawa (personal communication) pointed out to me that when he judges (i) more or less acceptable, he interprets it in such a way that there is a temporal sequence between the event of the first conjunct and that of the second conjunct. As mentioned in section 1.3.3 of Chapter 1, it is well-known that extraction from such asymmetrical coordination may violate the CSC, and this type of exceptions are not my concern in this work. Example (2) in the text is controlled in this respect by adding temporal adjuncts, and all of my informants uniformly judge it unacceptable.

(2) *Watasi-wa [$_{CP}$ Yamada kyoozyu-ga[$_{VP}$ kesa **nani-o** tabe]&
I-Top Y. prof.-Nom this:morning **what-Acc** eat
[$_{VP}$ sakuban koohii-o non-da] ka] sitteiru.
last:night coffee-Acc drink-Past Q know
'I know [Q Prof. Yamada [ate what this morning] and [drank coffee last night]].'

An interesting contrast between English and Japanese emerges when each conjunct contains an in-situ *wh*-phrase: Japanese allows such ATB distribution of in-situ *wh*-phrases, whereas English does not. Thus, putting another *wh*-phrase in the second conjunct in (2) saves the example from the CSC effect (Kato 2006, Yoon 1994, 1997), while such an ameliorating effect cannot be obtained in (1) (Bošković and Franks 2000). This is shown in (3)-(4) below.

(3) *ATB distribution of in-situ* wh*-phrases in Japanese*

a. Watasi-wa [$_{CP}$ John-ga [$_{VP}$ kesa **nani-o** tabe]&[$_{VP}$ sakuban
I-Top J.-Nom this:morning **what-Acc** eat last:night
nani-o nonda] ka] sitteiru.
what-Acc drank Q know
'I know [Q John ate what this morning and drank what last night].'

b. Watasi-wa [$_{CP}$ John-ga [$_{VP}$ kesa **nani-o** tabe]&[$_{VP}$ sakuban
I-Top J.-Nom this:morning **what-Acc** eat last:night
dare-ni atta] ka] sitteiru.[2]
who-Dat met Q know
'I know [Q John ate what this morning and met who last night].'

(4) *ATB distribution of in-situ* wh*-phrases in English*

*Who said [that John bought **what**] and [that Peter sold **what**]?[3]

(Bošković and Franks 2000)

The aim of this chapter is to propose an account of this contrast. It will be argued that the contrast can be explained under the hypothesis that in Japanese, but not in English, *wh*-in-situ is licensed through null operator movement. Thus, to the extent that my analysis succeeds, the above contrast lends support to the null operator approach to Japanese *wh*-in-situ (Watanabe 1992a, b; cf. also Hagstrom 1998).

Our discussion in the rest of this chapter goes as follows. The next section briefly reviews four major approaches to *wh*-in-situ in the Minimalist Program: the feature

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[2] Witness also the acceptability of (i), which involves a larger size of coordination.

(i) Watasi-wa [$_{CP}$ John-ga [$_{VP}$[$_{CP}$ Hanako-ga **nani-o** katta to] ii]&
I-Top J.-Nom H.-Acc **what-Acc** bought C say
[$_{VP}$[$_{CP}$ Mary-ga **nani-o** utta to] omotta] ka] sitteiru
M.-Nom **what-Acc** sold C thought Q know
'I know [Q John [said that Hanako bought what] and [thought that Mary sold what]]'

[3] Some speakers judge the following examples, which also involve ATB distribution of in-situ *wh*-phrases, to be more acceptable than (4):

(i) a. %I wonder which person [admires **who**] and [likes **who**]. (Cho and Zhou 2002)
b. %John wonders who [bought **what** this morning] and [sold **what** last night].

This fact will be taken up in section 6.5.2.2.

movement approach, the covert phrasal movement approach, the Agree approach, and the null operator approach. Section 6.3 argues that as long as any of the first three approaches is on the right track for English *wh*-in-situ, the impossibility of ATB distribution of in-situ *wh*-phrases in the language can be accounted for. Put differently, under the first three approaches, there is no way of deriving sentences each of whose conjuncts contains an in-situ *wh*-phrase. Section 6.4 claims that the possibility of ATB distribution of in-situ *wh*-phrases in Japanese can be explained if we assume that *wh*-in-situ in the language is licensed through null operator movement. Specifically, I argue that sideward movement of a null operator plays a key role. Section 6.5 discusses some theoretical implications and remaining issues of my analysis. Section 6.6 is a summary of the discussion.

6.2 Approaches to *Wh*-in-situ in the Minimalist Program

Since Huang's (1982) discovery of its similarities with overt *wh*-movement, *wh*-in-situ has been one of the main topics in generative syntax and this phenomenon has been arousing much attention and has been receiving various analyses. Three of the major approaches to *wh*-in-situ on the minimalist market are the feature movement (Move F) approach (cf., e.g., Chomsky 1995; for Japanese see Pesetsky 2000), the covert phrasal movement (Move P) approach (cf., e.g., Chomsky 2004, Pesetsky 2000), and the Agree approach (cf., e.g., Chomsky 2000, 2001).[4]

[4] Since the aim of this chapter is to explore the nature of *wh*-in-situ in Japanese, I do not discuss the "choice function approach" here (Reinhart 1998). This is because although licensing of *wh*-in-situ through a choice function is assumed to be immune to island constraints (op. cit.), Japanese *wh*-in-situ exhibits (*wh*-)island effects (Nishigauchi 1986, 1990, Watanabe 1992a, b, among others; for more recent discussion, see Kitagawa et al. 2004). For unselective binding, see section 6.5.

Under the Move F approach, the formal features of an in-situ *wh*-phrase move and adjoin to C^0, as shown in (5) ("WH" and "FF[WH]" stand for a *wh*-phrase and formal features of a *wh*-phrase, respectively).

(5) *Move F*

$FF[WH]_i$-C^0 …… WH_i

↑_____|

Move

The moved formal features and the in-situ *wh*-phrase are interpreted as an operator and a variable, respectively, at LF.

Under the Move P approach, an in-situ *wh*-phrase undergoes phrasal movement to Spec,CP and the lower copy is pronounced, as shown in (6).

(6) *Move P*

~~WH_i~~ C^0 …… WH_i

↑_____|

Move

The higher copy and the lower copy of the *wh*-phrase are interpreted at LF as an operator and a variable, respectively.

Under the Agree approach, no movement takes place, and an in-situ *wh*-phrase is licensed through entering into an Agree relation with the [+Q] feature on C^0, as shown in (7).

(7) *Agree*

$C^0_{[+Q]i}$ …… WH_i
|_____|
Agree

I assume that under the Agree approach, the checked [+Q] feature on C^0 is interpreted as an operator and the *wh*-phrase (or its relevant feature) is interpreted as a variable at the LF interface. I will represent the operator-variable chain by co-indexing the feature and the *wh*-phrase.[5] I further assume, for the sake of exposition, that when any number *n* *wh*-phrases are associated with an interrogative complementizer, this complementizer has *n* [+Q] features. So, for example, when an interrogative C^0 is associated with three *wh*-phrases, as in *Who bought what for whom?*, it carries three [+Q] features, each of which establishes an Agree relation with one of the *wh*-phrases.[6]

In addition to these three approaches, for *wh*-in-situ languages such as Japanese, another approach has been entertained: the null operator approach (cf., e.g., Watanabe 1992a, b; see also Hagstrom 1998 for a variant). In this approach, a null operator is base-generated inside an in-situ *wh*-phrase and it "overtly" moves to Spec,CP, as shown in (8).

(8) *Null operator movement*

Op_i C^0 …… [t_i [WH]]
↑_____|

[5] I assume, following Watanabe (2004a), that the [+Q] feature on C^0 is interpretable and as such remains visible at LF even after it is checked.

[6] But in what follows I omit the representation of [+Q] features that induce *wh*-movement (overt or covert, featural or phrasal), which means that I only represent [+Q] features which enter into pure Agree relations.

Such null operator movement is not available to English, and Watanabe (1992b) claims that this difference in availability of null operator movement between English and Japanese is due to the presence of quantificational particles in Japanese which attach to *wh*-elements (or indeterminates) to form various quantificational expressions and the absence thereof in English (see Watanabe 1992b for details).

6.3 English

Returning to our main concern, ATB distribution of in-situ *wh*-phrases, let us first consider why it is ruled out in English. Before we embark on the task, however, let us confirm that normal CSC effects with *wh*-in-situ as seen in (1), repeated here as (9), can be accounted for by the LF Representational CSC regardless of which of the three possible approaches to English *wh*-in-situ is adopted.

(9) *Who said [that John bought **what**] and [that Peter sold a house]?

The assumptions which constitute the core of the LF Representational CSC are reproduced below:

(10) *LF Representational CSC*

a. A sentence with a coordinate structure is well-formed only if each of its component structures independently satisfies grammatical constraints.

b. Component structures of a sentence with a coordinate structure $=_{def}$ structures each of which is composed of one of the conjuncts together with the material which is not included by the coordinate structure.

The component structures of (9) under the Move F approach, the Move P approach, and the Agree approach are given in (11), (12), and (13), respectively (below, I represent copies of overtly moved *wh*-phrases as traces (*t*)).

(11) *Move F*

a. Who_i FF[what]$_j$-C^0 t_i said that John bought what_j

b. Who_i FF[what]$_j$-C^0 t_i said that Peter sold a house

(12) *Move P*[7]

a. Who_i what_j C^0 t_i said that John bought what_j

b. Who_i what_j C^0 t_i said that Peter sold a house

(13) *Agree*

a. Who_i $C^0_{[+Q]j}$ t_i said that John bought what_j

b. Who_i $C^0_{[+Q]j}$ t_i said that Peter sold a house

One of the component structures in each pair (i.e. (11b), (12b), and (13b)) involves vacuous quantification, and this is why (9) is ungrammatical, according to the condition in (10a).

Now let us consider how the ungrammaticality of English examples with ATB distribution of in-situ *wh*-phrases like (4), repeated below as (14), can be explained under the three approaches to *wh*-in-situ.

[7] I adopt Richards' (2001) "tucking-in" mechanism, assuming that the landing site of the covert *wh*-movement of *what* is the lower Spec,CP, though nothing in our discussion depends on this assumption.

(14) *ATB distribution of in-situ* wh*-phrases in English*

*Who said [that John bought **what**] and [that Peter sold **what**]?

6.3.1 Move F and Move P

Let us begin with the Move F and Move P approaches. In these approaches, the LF representation of (14) should be schematically like (15a) or (15b), where WH_1, WH_2, and WH_3 are the subject *wh*-phrase, the in-situ *wh*-phrase in the first conjunct, and the in-situ *wh*-phrase in the second conjunct, respectively.

(15) a. *Move F*

WH_1 FF$[WH]_2$-FF$[WH]_3$-C^0 … t_1 … [… WH_2 …]&[… WH_3 …]

b. *Move P*

WH_1 WH_2 WH_3 C^0 … t_1 … [… WH_2 …]&[… WH_3 …]

In both of the component structures of (15a) and (15b), the ban on vacuous quantification is violated. Consider, for example, the component structures of (15b) in (16).

(16) *Component structures of (14) under the Move P approach*

a. WH_1 WH_2 WH_3 C^0 … t_1 … [… WH_2 …]

b. WH_1 WH_2 WH_3 C^0 … t_1 … [… WH_3 …]

The violators are WH_3 in (16a) and WH_2 in (16b). The ungrammaticality of (14) can thus be explained by the Representational CSC.

It should be noted in this connection that the ungrammaticality of the following example from Serbo-Croatian can be explained in the same way (corresponding examples

in other multiple *wh*-fronting languages such as Russian, Romanian (Kasai 2004), and Polish (Citko 2005) are also ungrammatical):

(17) *Serbo-Croatian*

*Koga$_i$ sta$_j$ on [vidi t_i] i [jede t_j]?

whom what he sees and eats

'Whom what does he see and eat?' (Kasai 2004: 169)

Here, the first *wh*-phrase has been extracted from the first conjunct, and the second *wh*-phrase from the second conjunct. Like (15a) and (15b), each component structure of this example violates the ban on vacuous quantification.

6.3.2 Agree

Next, suppose English *wh*-in-situ is licensed through (pure) Agree. In this case, there seem to be two subcases to consider.

6.3.2.1 When C^0 has two [+Q] features for the in-situ wh-phrases

The first subcase is the one in which the interrogative C^0 carries two [+Q] features for the two in-situ *wh*-phrases. In this case, if both of the two [+Q] features succeed in establishing an Agree relation with one of the in-situ *wh*-phrases, the schematic LF representation of (14) should be like (18) below.

(18) *Possible LF representation of (14) under the Agree approach*

$WH_1\ C^0_{[+Q]2[+Q]3} \ldots t_1 \ldots [\ \ldots WH_2 \ldots\ ]\&[\ \ldots WH_3 \ldots\ ]$

Now it is clear that this LF representation induces a violation of the ban on vacuous quantification in each component structure (recall that under the Agree approach, each [+Q] feature counts as an operator).[8]

6.3.2.2 When C^0 has one [+Q] feature for the in-situ wh-phrases

The second subcase to consider is the one in which the interrogative C^0 bears only one [+Q] feature for the two in-situ *wh*-phrases. In this case, the question is why "ATB agreement" depicted in (19) is not possible.

(19) *"ATB agreement"*

$C^0_{[+Q]}$ … [… WH …]&[… WH …]
|Agree |
|Agree |

Here, the single [+Q] feature on the complementizer Agrees with the two in-situ *wh*-phrases at the same time.[9]

At first sight, ATB agreement as in (19) appears to be possible because ATB movement is possible. Consider the representations in (20a) and (20b) below, which are a representation before an ATB *wh*-movement occurs and a representation after it occurs, respectively.

[8] Another possibility is that one of the [+Q] features on C^0 fails to establish an Agree relation with the in-situ *wh*-phrase in the second conjunct, causing the derivation to crash. See the discussion in the next subsection.

[9] See Hiraiwa 2005 for the possibility of "Multiple Agree," whereby a single Probe feature can Agree with multiple Goals simultaneously.

(20) *ATB movement*

a. $C^0_{[+Q]}$ … [… WH …]&[… WH …] (Before)

b. WH $C^0_{[+Q]}$ … [… *t* …]&[… *t* …] (After)

It seems plausible to say that a complementizer that induces an ATB *wh*-movement has only one [+Q] feature since only one *wh*-phrase appears in its Spec position as a result of the movement. However, if Agree is a precondition for Move, as conceived in the current Minimalist Program (Chomsky 2000, 2001, 2004), the [+Q] feature must enter into an ATB agreement relation with the two occurrences of the *wh*-phrase in the pre-movement structure, (20a) (but see also Boeckx 2003b: Chapter 3 for the possibility of movement only dependent on (feature) Match(ing)).

However, there are several reasons to assume that ATB agreement is not permitted. First, consider the following examples, where a coordinate small clause appears in the *there*-construction:

(21) a. There was [[a man in the bathroom] and [a cat/two cats in the kitchen]].

b. *There were [[a man in the bathroom] and [a cat/two cats in the kitchen]].

(Niinuma and Park 2003)

In the *there*-construction, I^0 enters into an Agree relation with the associate NP of the expletive (Chomsky 2000, 2001). The fact that the auxiliary verb cannot take a plural form in (21) shows that I^0 can Agree with an NP in the first conjunct, but not with an NP in the second conjunct:

(22) There was-I^0 [$_{VP}$ a man …] and [$_{VP}$ a cat/two cats …]

ok *

Next, consider the following examples of Gapping sentences:

(23) a. We can't eat caviar and him/*he (eat) beans.

b. She grew up in Jacksonville, and me/??I in Tallahassee. (Schütze 2001)

Here, the case form that the subject in the second conjunct takes is not a nominative form, but a default case form. According to Johnson 1996, Gapping sentences involve VP coordination, and only the subject in the first conjunct raises to Spec,IP. Thus, the structure of (23b) prior to the subject raising is as in (24) (where the complex verb *grew up* has ATB moved to I^0; see section 2.2.2 of Chapter 2 for Johnson's analysis of Gapping).

(24) grew^up-I^0 [$_{VP}$ she …] and [$_{VP}$ me/I …]

Given that the nominative Case feature of a subject is checked by I^0, the case morphology fact in (23) also shows that I^0 cannot Agree with an NP in the second conjunct:

(25) grew^up-I^0 [$_{VP}$ she …] and [$_{VP}$ me/I …]

ok *

It seems reasonable to conclude from these observations that an Agree relation cannot be established between a Probe outside a coordinate structure and a Goal in the second conjunct. Niinuma and Park (2003) suggest that this is some sort of intervention

effect, due to the presence of another potential Goal in the first conjunct. Here I tentatively follow them and assume that a condition like the following holds:

(26) *Condition on Agree in coordination*

A Probe outside a coordinate structure cannot Agree with a Goal in the "less close" conjunct when the "closer" conjunct also contains a potential Goal.[10]

In the cases seen above, I^0 cannot Agree with an NP in the second conjunct in the presence of another NP in the first conjunct.

Given condition (26), ATB agreement as in (19) is impossible, and the unacceptability of (14), an example with ATB distribution of in-situ *wh*-phrases, can be attributed to the failure of the [+Q] feature on C^0 to Agree with the in-situ *wh*-phrase in the second conjunct:

(27) $C^0_{[+Q]}$ … [… WH …]&[… WH …]
|_____*Agree_____|

Thus, the ATB distribution of in-situ *wh*-phrases is ruled out under the Agree approach even if C^0 has only one [+Q] feature.

[10] The notion of closeness here does not necessarily have to be interpreted in terms of linear order. Under hierarchical approaches to coordination, the first conjunct is assumed to be positioned higher than the second conjunct in head-initial languages (see, e.g., Johannesen 1998, Kayne 1994, Munn 1993, Zoerner 1995). If these approaches are on the right track, it might be possible to define the closeness in hierarchical terms.

Note also that the alleged intervention effects induced by condition (26) are different from "genuine" intervention effects discussed in the literature such as *wh*-island effects and superiority effects in that there is no c-command relation between the two potential Goals in the cases handled by (26).

6.3.2.3 ATB movement as sideward movement

One question arises at this point. If condition (26) holds, why is ATB movement possible? As seen above, if Agree is a precondition for Move, it appears that ATB agreement should be a precondition for ATB movement, but condition (26) prevents ATB agreement.

We can circumvent the problem by adopting the sideward movement approach to ATB movement (Hornstein and Nunes 2002, Nunes 2001, 2004).[11] Roughly put, although ATB movement is normally assumed to proceed as in (28), it proceeds as in (29) under the sideward movement approach (H^0 = head driving the ATB movement).

(28) *Traditional analysis of ATB movement*

XP H^0 … [… *t* …]&[… *t* …]
↑_____| |
↑_____|

(29) *Sideward movement analysis of ATB movement*

XP H^0 … [… *t* …]&[… *t* …]
↑_____|↑_____|

Under the standard view, XP is moved both from the first conjunct and from the second conjunct. On the other hand, under the sideward movement approach, it first moves from the second conjunct into the first conjunct, and then moves to the final landing site, Spec,HP. In the latter derivation, no movement occurs directly from the second conjunct

[11] See also Munn 1993 for another approach to ATB movement which enables us to avoid the problem at issue.

to Spec,HP, which means that no Agree occurs between H^0 and the occurrence of XP in the second conjunct; hence no violation of condition (26).

It should be noted here that the second step in the derivation in (29) should violate the CSC if this constraint were a derivational constraint on movement and this would be incompatible with the acceptability of ATB movement. In contrast, the derivation in (29) gives rise to no problem under the LF representational approach to the CSC adopted here (see (10) above). For example, if XP is a *wh*-phrase, the second step in (29) is permitted because it does not result in creating vacuous quantification in any of the component structures. Therefore, the discussion so far is another argument in favor of the LF representational view of the CSC as opposed to the derivational view: Condition (26) forces one to adopt the sideward movement approach to ATB movement, which can work only under the LF representational approach to the CSC (see also Appendix of Chapter 2).[12]

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[12] The sideward movement approach supplemented with the condition in (26) allows the derivation to proceed as in (29), but not as in (i).

(i) XP H^0 … [… *t* …]&[… *t* …]
↑ |_____↑|
|_____|

Here, XP is base-generated in the first conjunct, moves sideward into the second conjunct, and then moves out of the coordinate structure to the final landing site. As Željko Bošković (personal communication) pointed out to me, the impossibility of this derivation gives us a clue to an explanation of the asymmetry between the conjuncts with respect to reconstruction effects illustrated by the following set of examples:

(i) *Asymmetry between the conjuncts w.r.t. reconstruction effects*
a. Which pictures of himself did John buy *t* and Mary paint *t*?
b. *Which pictures of herself did John buy *t* and Mary paint *t*? (Munn 1992: 10)

If it is possible to somehow block "sideward reconstruction," we can explain this contrast. But see also footnote 16 below.

However, once we admit the possibility of sideward movement, another problem crops up: That is, how can we rule out the derivation as in (30) for (14), an example where each conjunct contains an in-situ *wh*-phrase?

(30) *Imaginable derivation of (14)*

C^0 … [… WH …]&[… WH …]
↑_____|↑_____|
covert overt

Here, the *wh*-phrase undergoes ATB movement in the way assumed by the sideward movement analysis; the first step is overt and the second step is covert (whether this covert step is analyzed as a feature movement or a phrasal movement is immaterial here); and both of the copies of the *wh*-phrase in the conjuncts are pronounced. This derivation satisfies the LF Representational CSC (because it does not create vacuous quantification in either component structure) and the condition in (26) (because the movement to Spec,CP does not occur from the second conjunct).

It should be noted here that in the derivation at issue, the two in-situ *wh*-phrases are copies of one and the same phrase. I claim that the problem with this derivation comes from linearization. For example, the *wh*-phrase both precedes and follows the conjunction at the same time, which violates one of the three defining properties of linear orderings: antisymmetry (i.e. ¬(xLy & yLx); Kayne 1994: 4).[13]

[13] One might ask why deletion of one of the two lower copies fails to save the derivation. Specifically, for example, why is (i) below ungrammatical?

(i) *Who said that John bought what and that Peter sold?

In the derivation in question, *what* moves as in (30), but its copy in the second conjunct is deleted at PF, satisfying the antisymmetry condition on linear orderings. I tentatively assume (contra

To sum up the discussion so far, whether English *wh*-in-situ is licensed through movement (featural or phrasal) or Agree, there is no licit derivation for ATB distribution of in-situ *wh*-phrases.

6.4 Japanese

Recall that ATB distribution of in-situ *wh*-phrases is permitted in Japanese. The relevant examples are repeated below:

(31) *ATB distribution of in-situ* wh-*phrases in Japanese*

a. Watasi-wa [$_{CP}$ John-ga [$_{VP}$ kesa **nani-o** tabe]&[$_{VP}$ sakuban
I-Top J.-Nom this:morning **what-Acc** eat last:night
nani-o nonda] ka] sitteiru.
what-Acc drank Q know
'I know [Q John ate what this morning and drank what last night].'

b. Watasi-wa [$_{CP}$ John-ga [$_{VP}$ kesa **nani-o** tabe]&[$_{VP}$ sakuban
I-Top J.-Nom this:morning **what-Acc** eat last:night
dare-ni atta] ka] sitteiru.
who-Dat met Q know
'I know [Q John ate what this morning and met who last night].'

Hornstein 2001) that because there is no c-command relation between the lower copies, the PF interface cannot determine which should be deleted, causing the derivation to crash.

Given the acceptability of these examples, the discussion in the last section indicates that Japanese *wh*-in-situ cannot be analyzed as being licensed by featural or phrasal movement or Agree. Then, how are they licensed?

The null operator approach comes into the picture here. Recall that under this approach, a null operator is base-generated inside an in-situ *wh*-phrase and it "overtly" moves to Spec,CP, as shown in (32).

(32) *Null operator movement*

$Op_i\ C^0$ …… [t_i [WH]]
↑_____|

Recall also that such null operator movement is available in Japanese but not in English. I claim that in sentences like (31a, b), ATB movement of a null operator is involved, as shown in (33) (recall that Japanese is a head-final language).

(33) *Derivation of (31a, b)*

$[_{CP}$ Op $[_{C'}$ … [… [*t* [WH]] …]&[… [*t* [WH]] …] … $C^0]]$
↑ |_____↑|
|_____|

In this derivation, the null operator is first base-generated inside the in-situ *wh*-phrase in the first conjunct, then moves sideward into the in-situ *wh*-phrase in the second conjunct, and finally raises out of the coordinate structure to Spec,CP. Note that this derivation does not violate the Representational CSC (neither of the component structures involves vacuous quantification), the condition on Agree in (26), repeated below as (34) (the

operator moves out of the coordinate structure from the closer conjunct to the Probe[14]), nor the antisymmetry condition on linearization (the two in-situ *wh*-phrases are separate syntactic objects):

(34) *Condition on Agree in coordination*

A Probe outside a coordinate structure cannot Agree with a Goal in the "less close" conjunct when the "closer" conjunct also contains a potential Goal.

Syntactically, the derivation being argued for seems to have no problem. How about its semantics? The rough semantic representations of the embedded questions in (31a) and (31b) are the following:

(35) *Semantic representations of (31a, b)*

a. $WH_{x,y}$ [x and y are things] John ate x this morning and drank y last night

b. $WH_{x,y}$ [x is a thing and y is a person] John ate x this morning and met y last night

As is clear from these, those interrogative clauses ask about two things (or one thing and one person). However, in my analysis, they contain only one operator. This might appear to be a problem, but sentences like (36), which means (37), show that it is possible to ask about two things with one operator (see also Gawron and Kehler 2003, Munn 1998, 1999b).

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[14] As mentioned in footnote 10, the closeness here does not necessarily have to be measured in terms of linear order: Under some hierarchical approaches to coordination, the second conjunct is assumed to be positioned higher than the first conjunct in head-final languages (cf. Johannesen 1998, Munn 1993, Zoerner 1995, among others).

(36) I wonder which picture of himself$_{i/j}$ John$_i$ likes and Peter$_j$ hates. (Haïk 1985: 286)

(37) I wonder which picture of John John likes and which picture of Peter Peter hates.[15]

I claim that the LF representation of (31a, b) is more like (38), where the operator bears two indices each of which is associated with one of the traces.[16]

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[15] Munn (1992) observes that this type of "sloppy reading" is not allowed, but all the speakers I consulted agree with Haïk (1985), judging it to be acceptable.

[16] In footnote 12 above, we saw that on the assumption that "sideward reconstruction" is not allowed, the following contrast can be explained by the sideward movement approach to ATB movement which requires that sideward movement go from inside the second conjunct into the first conjunct in head-initial languages:

(i) *Asymmetry between the conjuncts w.r.t. reconstruction effects*
   a. Which pictures of himself did John buy *t* and Mary paint *t*?
   b. *Which pictures of herself did John buy *t* and Mary paint *t*?

Sentence (36), where the anaphor in the ATB moved phrase has the same index as the subject in the second conjunct, is a problem for this line of analysis. Suppose now, against the assumption made in footnote 12, that sideward reconstruction is possible. Then, we can explain the entire paradigm by adopting the following assumption:

(ii) When sideward reconstruction occurs, the reconstructed phrase must be interpreted in both of the trace positions in the coordinate structure.

In (36), sideward reconstruction occurs, so that the *wh*-phrase is reconstructed up to the trace position in the second conjunct. The above assumption requires that the *wh*-phrase be interpreted both in the first conjunct and in the second conjunct. In each conjunct, the anaphor is bound by the subject, hence the indicated interpretation. In (ib), in order for the anaphor to be bound by *Mary*, the *wh*-phrase must undergo sideward reconstruction into the second conjunct, but this forces it to be also interpreted in the first conjunct, inducing gender disagreement. In (ia), the *wh*-phrase is reconstructed to the trace position in the first conjunct, but not further. Since the trace position in the second conjunct is not "activated," the anaphor can be bound only by the first subject with no problem. I speculate that the assumption in (ii) can be somehow derived from the fact that there is no c-command relation between the two trace positions. For example, it might be plausible to assume that the absence of the c-command relation prevents the LF interface from determining which copy of the ATB moved phrase in the coordinate structure should be interpreted (this is reminiscent of the assumption about linearization at PF suggested in footnote 13). I leave further exploration of this issue for future research (see Nissenbaum 2000: 44 for a potential problem for the analysis suggested here).

(38) *Schematic LF representation of (31a, b)*

$Op_{i/j}$ … [… [t_i [WH]] …]&[… [t_j [WH]] …] … C^0

Examples like the following give further support for the representation in which an ATB moved phrase has a different index in each conjunct:

(39) a. [Each other]$_{i/j}$, [[Tom and Mary]$_i$ love *t*] and [[John and Sue]$_j$ hate *t*].

b. Zibun-zisin$_{i/j}$-o Yamada kyoozyu-ga[[Taroo$_i$-ga *t* home]&[Hanako$_j$-ga
self-self-Acc Y. prof.-Nom T.-Nom praise H.-Nom
t hihansita] to] itta.
criticized C said
'Prof. Yamada said that Taroo praised himself and Hanako criticized herself.'

In summary, the fact that Japanese permits ATB distribution of in-situ *wh*-phrases can be accounted for only by assuming that *wh*-in-situ in the language is licensed through null operator movement, and in this sense, it shows that among several possible approaches to *wh*-in-situ, the null operator approach is the most plausible for Japanese.

6.5 Theoretical Implications and Remaining Issues

In the remainder of this chapter, I discuss some theoretical implications and remaining issues of the analysis proposed so far.

6.5.1 Theoretical implications

My analysis of ATB distribution of in-situ *wh*-phrases has at least two theoretical implications for the null operator approach to *wh*-in-situ, where a null operator is base-generated inside a *wh*-phrase and then moves to Spec,CP, as seen above.

6.5.1.1 No LF movement of the residue of a wh-phrase

First, Watanabe (1992b: section 4) claims that the residue of a *wh*-phrase from which a null operator is already moved raises in LF, adjoining to the null operator, and that a real operator-variable chain is formed by this movement (the trace of the operator is omitted below):

(40) *Movement of the residue of a* wh-*phrase*

C^0 …… [Op[WH]] …… → Op C^0 …… [[WH]] ……

↑_____| ↑_____|

→ [WH_i[Op]] C^0 …… t_i ……

This claim leads to an LF representation like the following for a sentence with ATB distribution of in-situ *wh*-phrases:

(41) [WH_j[WH_i[Op]]] C^0 … [… t_i …]&[… t_j …]

This representation should be ruled out by the Representational CSC (or the ban on vacuous quantification). Therefore, it should be concluded that, contra Watanabe, no LF movement of the residue of a *wh*-phrase occurs.

6.5.1.2 Occurrence of a null operator in wh-adjuncts

The second theoretical implication of my analysis concerns the difference between *wh*-arguments and *wh*-adjuncts. Tsai (1994, 1999) claims, in order to explain a contrast like that in (42), that a null operator cannot be base-generated inside *wh*-adjuncts, and, as a consequence, this type of *wh*-phrase must move for itself (below "R.C." stands for "relative clause").

(42) a. Wh-*argument*

Kimi-wa [$_{NP}$[$_{R.C.}$ **dare**-ga kaita] hon]-o yomimasita ka?

you-Top **who**-Nom wrote book-Acc read Q

'Who did you read books which wrote?'

b. Wh-*adjunct*

*Kimi-wa [$_{NP}$[$_{R.C.}$ kare-ga **naze** kaita] hon]-o yomimasita ka?

you-Top he-Nom **why** wrote book-Acc read Q

'Why did you read books which he wrote?'

(Nishigauchi 1990: 40-41)

This set of examples shows that *wh*-arguments but not *wh*-adjuncts can appear in a Complex NP (cf. Huang 1982). If we assume, following Watanabe (1992a, b), that a null operator may be base-generated at the edge of any NP/PP containing the *wh*-argument with which it is construed, we can analyze (42a) in the following way:

(43) Wh-*argument*

[$_{CP}$ [$_{C'}$ …… [$_{NP}$ Op [$_{R.C.}$ … dare …]] ……]]

↑_____|

The null operator is base-generated at the edge of the NP to which the relative clause is adjoined, and then moved to Spec,CP. Because this movement does not cross the Complex NP, no locality violation is incurred. Facing the ungrammaticality of (42b), Tsai claims that null operator movement is not available to *wh*-adjuncts, so that this type of *wh*-phrase must move on its own. Thus, the *wh*-adjunct in (42b) is doomed to cross the Complex NP island (see also Nishigauchi 1986, 1990, Pesetsky 1987, Watanabe 1992a, b):

(44) Wh-*adjunct*

$[_{CP}\ \ [_{C'}$ …… $[_{NP}[_{R.C.}$ … naze …]] ……]]

↑_____*_____|

However, consider the following example, where each conjunct contains an in-situ *wh*-adjunct (Kato 2006):

(45) *ATB-distribution of in-situ* wh-*adjuncts*

Watasi-wa [$_{CP}$ betubetuno kyoozyu-ga[$_{VP}$ **naze** Hanako-o home]&[$_{VP}$ **naze**
I-Top different prof.-Nom **why** H.-Acc praise **why**
Taroo-o sikatta] ka] sitteiru.[17,18]
T.-Acc scolded Q know
'I know what are the reasons x and y such that different professors praised Hanako for x and scolded Taroo for y.'

The acceptability of this example indicates that *wh*-adjuncts also make use of null operator movement. This result forces one to reinterpret the above contrast between *wh*-arguments and *wh*-adjuncts. It may be taken to indicate that a null operator construed with a *wh*-argument can be base-generated away from the *wh*-phrase (as seen in (43)), whereas an operator construed with a *wh*-adjunct must, for some reason, be base-generated inside the *wh*-phrase.

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[17] Examples like (ia) and (ib) are also acceptable, as pointed out to me by Yoshihisa Kitagawa and Shigeru Miyagawa (personal communications), respectively.

(i) a. Watasi-wa[$_{CP}$ betubetuno kyoozyu-ga [$_{VP}$ **naze** Hanako-o home]&
I-Top different prof.-Nom **why** H.-Acc praise
donoyoona betuno riyuu-de Taroo-o sikatta] ka] sitteiru.
what other reason-for T.-Acc scolded Q know.
'I know what is the reason x and what is the other reason y such that different professors praised Hanako for x and scolded Taroo for y.'

b. Watasi-wa[$_{CP}$ betubetuno kyoozyu-ga [$_{VP}$ **naze** Hanako-o home]&
I-Top different prof.-Nom **why** H.-Acc praise
doo Taroo-o sikatta] ka] sitteiru.
how T.-Acc scolded Q know.
'I know what is the reason x and what is the manner y such that different professors praised Hanako for x and scolded Taroo in y.'

[18] Ko (2005) claims that *naze* 'why' must be base-generated in Spec,CP. However, as I point out in Kato 2006, the acceptability of examples like (45), where each of the two VP conjuncts contains one occurrence of *naze*, indicates that Ko's claim is not right.

6.5.2 Remaining issues

Now let us turn to remaining issues.

6.5.2.1 D-linked wh-phrases

The first issue concerns D-linked *wh*-phrases. Bošković and Franks (2000) observe that the following example is acceptable:

(46) *D-linked* wh-*phrases*

Who said [that John bought **which house**] and [that Peter sold **which house**]?

Compare this with unacceptable (14), which is repeated here as (47).

(47) *Non-D-linked* wh-*phrases*

*Who said [that John bought **what**] and [that Peter sold **what**]?

On the assumption that a D-linked *wh*-phrase can be licensed through unselective binding (cf. Pesetsky 1987), it might be possible to assign an LF representation as in (48) to (46).

(48) *Unselective binding*

$\text{Who}_k\ C^0_{i/j}$ … t_k … [… which house_i …]&[… which house_j …]

(C^0 = unselective binder)

Here, the unselective binder bears two indices each of which corresponds to one of the in-situ *wh*-phrases (recall that an unselective binder can bind multiple variables). In this respect, (48) is similar to Japanese examples with ATB distribution of in-situ *wh*-phrases,

where an ATB moved null operator has two indices, and should be ruled in on a par with the latter.

Bošković and Franks (2000) also observe that (49a) is slightly degraded but better than (49b).

(49) a. ?Which man said that John bought a house and that Peter sold **which house**?

b. *Who said that John bought a house and that Peter sold **what**?

This contrast might be a problem because the unselective binder binding the in-situ *wh*-phrase in one of the component structures of (49a) fails to bind a variable in the other component structure. However, Chomsky (1981: 279), Fox (2000: 53), and Pesetsky (1982: 611, 618) judge the same type of examples unacceptable.[19] Clearly, more investigation is needed in this domain, and I leave the issue for future research.

6.5.2.2 Some variation in judgments

Another issue arises from judgmental variation. My informants uniformly judge example (47) unacceptable, but I found that some speakers judge examples as in (50) to be more acceptable than (47) ((50a) is cited from Cho and Zhou 2002, where it is rated "ok").[20,21]

(50) a. %I wonder which person [admires **who**] and [likes **who**].

[19] In fairness, I note that Bošković and Franks (footnote 7) mentions Pesetsky's (1982) example and judgment.

[20] Japanese sentences with ATB distribution of in-situ *wh*-phrases do not show judgmental variation like this. For example, (31a) and (31b) are accepted by all the speakers I consulted.

[21] For some unknown reasons, the number of the speakers who judge (50b) better than (47) is larger than that of the speakers who judge (50a) better than (47).

b. %John wonders who [bought **what** this morning] and [sold **what** last night].

It should be noted that in (47), the higher *wh*-phrase and the lower ones are intervened by a clause boundary, but this is not the case in (50).

It might be plausible to claim that for those speakers that judge (50a) and/or (50b) better than (47), the *wh*-phrases in the better example(s) can undergo a sort of absorption, creating a ternary operator, as shown in (51).

(51) *Absorption*

John wonders $WH_{x/y/z}$ x [bought y this morning] and [sold z last night]

If this interpretation of the data is on the right track, the stability of speakers' judgment of (47) might be attributable to the clause-boundedness of absorption (Sloan 1991, Watanabe 2000a, among others). More investigation is needed in this domain, too, and I must leave it for future research.

6.6 Summary

In this chapter, I have proposed an explanation of the difference between English and Japanese in the acceptability of examples each of whose conjuncts contains an in-situ *wh*-phrase. I have argued that as long as *wh*-in-situ is licensed through movement (featural or phrasal) or Agree, there is no licit derivation for the ATB distribution of in-situ *wh*-phrases. Since Japanese permits it, *wh*-in-situ in this language should be licensed in a different way. I have argued that the Japanese fact can be explained under the null operator approach to *wh*-in-situ, and that in a sentence involving ATB distribution of in-

situ *wh*-phrases, ATB null operator movement takes place. Thus, one of the most important implications of the discussion in this chapter is that among several possible approaches to *wh*-in-situ in the Minimalist Program, the null operator approach is the most plausible for Japanese.

Chapter 7
Subject Raising in Japanese

7.1 Issue

In Chapter 3, I showed that Japanese scrambling exhibits CSC effects and took this fact as the evidence against the alleged total reconstruction property of the operation. One of the crucial examples I gave is the following:

(1) *Scrambling of the second object*

*Hanako-o$_i$ Yamada kyoozyu-ga[$_{VP}$ Taroo-o home]&[$_{VP}$ t_i sikatta].

H.-Acc Y. prof.-Nom T.-Acc praise scolded

'Hanako, Prof. Yamada praised Taroo and scolded.'

In this example, the object in the second conjunct has been scrambled across the subject in violation of the CSC (or, more precisely, the Theta Criterion, given the perspective of the LF representational approach to the CSC).

Now compare (1) with (2), where the first, instead of the second, object has been scrambled.

(2) *Scrambling of the first object*

(?)Taroo-o_i Yamada kyoozyu-ga t_i home & Hanako-o sikatta.

T.-Acc Y. prof.-Nom praise H.-Acc scolded

'Taroo, Prof. Yamada praised and scolded Hanako.'

Because this example is much more acceptable than (1) (Tokashiki 1989), it appears to be a counterexample to the CSC. The main goal of this chapter is to argue that we can reconcile the grammaticality of examples like (2) with the CSC by assuming that subject raising is optional in Japanese. As will be discussed in the last section, to the extent it succeeds, my analysis has an implication for the claim, which has been made by several researchers recently, that the traditional EPP, or the EPP on I^0/T^0, is universal (see, for example, Alexiadou and Anagnostopoulou 1998, Bailyn 2004, Chomsky 2000, Miyagawa 2001, 2003).

7.2 Optionality of Subject Raising in Japanese

In Kato 2006, I claim that example (2) does not exhibit a CSC effect, because scrambling out of the coordinate structure does not occur, although it appears to. More specifically, I claim that the structure of the example is like the following (where "+Pst" stands for the past tense morpheme (*-ta*); recall that Japanese is a *pro*-drop language):

(3) *Structure of (2)*

$[_{IP}\ [_{VP}$ Taroo$_i$ $[_{VP}$ Prof. Yamada$_j$ t_i praise]]&$[_{VP}$ *pro*$_j$ Hanako scold] I^0+Pst]

Following Fukui (1986), Kuroda (1988), and Takano (1996), among others, I assume that subjects do not have to raise to Spec,IP in Japanese (contra, for example, Kishinoto 2001, Nemoto 1993, Ueda 1990, Ura 2000, and Watanabe 1993, 1996). Thus, the scrambling of the first object to the sentence-initial position in (2) can be to a VP-adjoined position, as seen in (3). Because this movement does not go beyond the first conjunct, the CSC is not violated.

This line of analysis is supported by the fact that long-distance scrambling of the first object results in unacceptability. Witness the following example, which is as bad as (1):

(4) *Long-distance scrambling of the first object*

*Taroo-o$_i$ John-wa [$_{CP}$ Yamada kyoozyu-ga t_i home & Hanako-o sikatta to] itta.
T.-Acc J.-Top Y. prof.-Nom praise H.-Acc scolded C said
'Taroo, John said that Prof. Yamada praised and scolded Hanako.'

In this example, irrespective of the location of the embedded subject, the scrambling of the embedded first object crosses the coordinate structure, violating the CSC.[1]

---

[1] The following example, which I owe to Naoki Fukui (personal communication), is more acceptable than (4):

(i) ?Sono hon-o Taroo-wa [$_{CP}$ Hanako-ga *e* yomi & syohyoo-o kenasita to] itta.
the book-Acc T.-Top H.-Nom read review-Acc criticiazed C said
'The book, Taroo said that Hanako read and criticized a review of it.'

However, this example is more acceptable than (4) only when *syohyoo* is interpreted as a review of the book which Hanako read: If it is interpreted as a review of a different book, the contrast does not emerge. I speculate that the scrambled accusative phrase in (i) is an instance of so-called "major object," which has been analyzed to be an argument of verbs like *iu*/*sinziru*/*omou* 'say/believe/think' and subject to the aboutness condition (see Takano 2003 and references cited therein), so that the more precise structure of the example is like the following:

(ii) sono hon-o$_i$ Taroo-wa t_i [$_{CP}$ Hanako-ga *pro*$_i$ yomi & syohyoo-o kenasita to] itta.
'Of the book, Taroo said that Hanako read it and criticized a review of it.'

The analysis being proposed here is further supported by the contrast between (2) and the following example:

(5) Betubetuno *in the subject*

*Taroo-o betubetuno kyoozyu-ga t_i home & Hanako-o sikatta.

T.-Acc different prof.-Nom praise H.-Acc scolded

'Taroo, different professors praised and scolded Hanako.'

The subject of this example contains *betubetuno* 'different.' As seen in section 1.4 of Chapter 1, words meaning "different" have at least two possible readings, a sentence-internal reading and a sentence-external reading, and the Japanese word *betubetuno*, unlike English *different*, forces sentence-internal readings (Takano 2004). Thus, the following sentence can mean "the teacher who scolded Taroo and the one who scolded Hanako are different," but not "a teacher different from the one who has already been contextually defined scolded Taroo and Hanako":

(6) Betubetuno sensei-ga Taroo-to Hanako-o sikatta.

different teacher-Nom T.-and H.-Acc scolded

As observed by Carlson (1987), a sentence-internal reading of "different" cannot be licensed by a coordinate VP when "different" is a part of it. This is illustrated by the following example, which does not allow a sentence-internal reading:

When *syohyoo* is interpreted as a review of the book which Hanako read, the major object can establish an aboutness relation in each component structure, so that the example is ruled in.

(7) John spilled his milk and poached different eggs. (Carlson 1987: 540)[2]

On the basis of this observation, I claim that, unlike the subject in (2), the "different"-NP subject in (5) cannot remain in the first VP conjunct, since it must be interpreted sentence-internally due to the lexical property of *betubetuno*. Thus, it must raise out of the coordinate structure (arguably, to Spec,IP) and the scrambling of the first object must be to an IP-adjoined position, resulting in a violation of the CSC.

7.3 Against the IP Coordination Analysis

Some researchers propose analyzing what have been called Japanese sentences with VP coordination in the present work as involving IP/TP coordination (cf. Nakatani 2004, Tomioka 1993; see also Chung 2005 and Park 2004 for Korean). For example, according to the IP coordination analysis, a sentence like (8), which has been analyzed as in (9a) or (9b) depending on whether subject raising occurs or not, may have a structure as in (10).

(8) Taroo-ga kesa ringo-o tabe sakuban koohii-o non-da.
T.-Nom this:morning apple-Acc eat last:night coffee-Acc drink-Past
'Taroo ate an apple this morning and drank coffee last night.'

(9) *VP coordination analysis*

a. $[_{IP}$ Taroo $[_{VP}[_{VP}$ this:morning apple eat$]\&[_{VP}$ last:night coffee drink$]]$ I^0+Pst]

[2] Jonathan Bobaljik (personal communication) pointed out that sentence (7) can be interpreted "sentence-internally" with *different* meaning something like "different kinds of." However, when *different* has this meaning, it can be replaced with *various*, and this is one of the meanings of *different* which should be set aside when we discuss the problem of sentence-internal and sentence-external readings of that word (see Carlson 1987: 532-3).

b. $[_{IP}[_{VP}[_{VP}$ Taroo$_i$ this:morning apple eat]

$\&[_{VP}$ *pro*$_i$ last:night coffee drink]] I^0+Pst]

(10) *IP coordination analysis*

$[_{IP}[_{IP}$ Taroo$_i$ $[_{VP}$ this:morning apple eat] I^0(+Pst)]

$\&[_{IP}$ *pro*$_i$ $[_{VP}$ last:night coffee drink] I^0+Pst]]

The IP coordination analysis opens up the possibility of an alternative explanation of the acceptability of examples like (2), repeated below as (11).

(11) *Scrambling of the first object*

(?)Taroo-o$_i$ Yamada kyoozyu-ga t_i home & Hanako-o sikatta.

T.-Acc Y. prof.-Nom praise H.-Acc scolded

'Taroo, Prof. Yamada praised and scolded Hanako.'

That is, we can analyze this example as shown in (12).

(12) *Structure of (11) under the IP coordination analysis*

$[_{IP}$ Taroo$_i$ $[_{IP}$ Prof. Yamada$_j$ $[_{VP}$ t_i praise] I^0(+Pst)]]

$\&[_{IP}$ *pro*$_j$ $[_{VP}$ Hanako scold] I^0+Pst]

Here, the scrambling of the first object *Taroo* occurs within the first IP conjunct, the CSC not being violated. It should be noted that this analysis need not have recourse to the optionality of subject raising.

In what follows, I point out two problems with the IP coordination analysis, showing that examples like (11) should not be analyzed as in (12).

7.3.1 The non-finite verb in the first conjunct

Recall from section 1.4 of Chapter 1 that one of the characteristics of the coordinate structure involved in sentences like (8) is that only the verb in the second (or, more precisely, final) conjunct is inflected for tense. Crucially, the verb in the first conjunct is in its bare form. Recall also that under the VP coordination analysis assumed here, this fact can be captured by the assumption that a tense morpheme is base-generated under the head position of the IP which takes the coordinated VP as its complement, and undergoes PF lowering to the adjacent verb, as shown in (13) (Takano 2004; see section 1.4 of Chapter 1).

(13) *PF affix-lowering*

$[_{IP} \ldots [_{VP} \ldots\ldots V]\&[_{VP} \ldots\ldots V]\ I^0{+}Pst]$

$\uparrow\_\_\_\_|$

Then, can we explain the non-appearance of the tense morpheme on the first verb under the IP coordination analysis?

Nakatani (2004), one of the advocates of the IP coordination analysis, assumes that in sentences like (8), "the element(s) that are shared by both conjuncts and are at the right edge of the conjuncts may not be phonologically realized in the first conjunct" (p. 189). For Nakatani, the unrealization of the shared element(s) is an instance of Right Node Raising. Thus, in (8), the tense affix is shared by the two IP conjuncts and it is unrealized in the first (see (10)).

However, the assumption that verbal affixes shared by both IP conjuncts may be phonologically unrealized in the first conjunct seems dubious. Consider the following sets of data ((14)-(17) are cited from Kato 2006).

(14) a. Taroo-ga ringo-o tabe koohii-o nom-**ana-katta**.
T.-Nom apple-Acc eat coffee-Acc drink-**Neg-Past**
'Taroo ate an apple and didn't drink coffee.'

b. Taroo-ga ringo-o tabe-**na-katta** koohii-o nom-**ana-katta**.[3]
T.-Nom apple-Acc eat-**Neg-Past** coffee-Acc drink-**Neg-Past**
'Taroo didn't eat an apple and didn't drink coffee.'

(15) a. Taroo-ga ringo-o tabe orenzi-o tabe-**rare-ta**.
T.-Nom apple-Acc eat orange-Acc eat-**Pass-Past**
'Taroo ate an apple and had an orange eaten.'

b. Taroo-ga ringo-o tabe-**rare-ta** orenzi-o tabe-**rare-ta**.
T.-Nom apple-Acc eat-**Pass-Past** orange-Acc eat-**Pass-Past**
'Taroo had an apple eaten and had an orange eaten.'

On the assumption in question, the first verb in (14a) could be followed by unrealized negation and tense morphemes, and that in (15a) could be followed by unrealized passive and tense morphemes. Thus, the IP coordination analysis should predict that (14a) and

[3] Intuitively, in examples like this, where not only the second but also the first verb is inflected for tense, two sentences are juxtaposed, with the subject of the second sentence being *pro*, as shown below:

(i) [$_{IP}$ Taroo$_i$ apple eat-Neg-Past] [$_{IP}$ *pro*$_i$ coffee drink-Neg-Past]

(15a) can have the same interpretations as (14b) and (15b), respectively. However, this is a wrong prediction, as shown by their English translations.

One might claim that Japanese has a null tense morpheme, but not a null negation or passive morpheme (cf. Chung 2005, Tomioka 1993). This approach circumvents the problem arising from (14) and (15). However, it cannot explain in a principled way why the null tense morpheme cannot appear on the second verb (recall that Nakatani (2004) accounts for this by reducing the unrealization of the tense morpheme on the first verb to Right Node Raising). Moreover, because nothing in this approach prevents both the first and the second verbs from bearing an overt tense morpheme, it is predicted that (16a) and (16b) below have the same structure and behave in the same way in syntactic terms.

(16) a. Yamada kyoozyu-ga Taroo-o home Hanako-o sikat-ta.
Y. prof.-Nom T.-Acc praise H.-Acc scold-Past

b. Yamada kyoozyu-ga Taroo-o home-**ta** Hanako-o sikat-ta.
Y. prof.-Nom T.-Acc praise-**Past** H.-Acc scold-Past
'Prof. Yamada praised Taroo and scolded Hanako.'

However, this prediction is not borne out. For example, (16a), but not (16b), can be embedded:

(17) a. John-ga [Yamada kyoozyu-ga Taroo-o home Hanako-o sikat-ta to] omotteiru.
J.-Nom C think

b. ?*John-ga [Yamada kyoozyu-ga Taroo-o home-**ta** Hanako-o sikat-ta to]
J.-Nom C
omotteiru.
think
'John thinks that Prof. Yamada praised Taroo and scolded Hanako.'

Also, it is possible to create an interrogative sentence by adding a question particle at the end of (16a), but not (16b):

(18) a. [Yamada kyoozyu-ga Taroo-o home Hanako-o sikat-ta] no?
Q

b. *[Yamada kyoozyu-ga Taroo-o home-**ta** Hanako-o sikat-ta] no?[4]
Q

'Did Prof. Yamada praise Taroo and scold Hanako?'

All these considerations point to the conclusion that under the IP coordination analysis there is no principled way of capturing the fact that the first verb in the coordinate structure at issue is in its bare form.

[4] This example is acceptable under the reading "Prof. Yamada praised Taroo. Did he scold Hanako?," but this does not affect my argument. See also footnote 3.

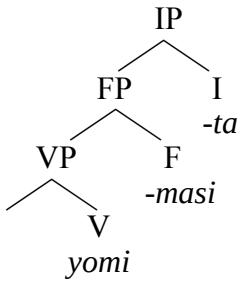
7.3.2 The verbal suffix *-mas*

The second problem for the IP coordination analysis involves the verbal suffix *–mas*. This suffix, which indicates formal speech level, precedes a tense morpheme, as shown below:

(19) Taroo-ga hon-o yomi-**masi**-ta.
T.-Nom book-Acc read-**Formal**-Past
'Taroo read a book.'

Since Japanese is a head-final language, the relative order between *–mas* and the tense morpheme can be taken to indicate that *–mas* appears in a head position below IP/TP, whose head position is assumed to be occupied by the tense morpheme. Thus, the structure of the verbal complex in (19) should be like the following (FP = some functional projection):

(20)



Now, given this structure, the IP coordination analysis makes an interesting prediction, namely that the verbal suffix *–mas* can appear in a conjunct of the coordinate structure at issue. However, this prediction is not borne out, as shown by the following example:

(21) *Taroo-ga ringo-o tabe-**masi** & koohii-o nomi-masi-ta.
T.-Nom apple-Acc eat-**Formal** coffee-Acc drink-Formal-Past
'Taroo ate an apple and drank coffee.'

If the coordination involved in this example is IP coordination, nothing should prevent *–mas*, whose base position is below IP, from appearing in the conjuncts. Thus, the unacceptability of this example is problematic for the IP coordination analysis. In contrast, it gives rise to no problem for the VP coordination analysis, which assumes that the size of the coordination in (21) is VP: The unacceptability of this example can be reduced to the impossibility of *-mas* appearing within VP.

To confirm that the unacceptability of (21) stems from the appearance of *–mas* in the VP conjunct, compare it with (22) and (23) below.

(22) Taroo-ga ringo-o tabe & koohii-o nomi-masi-ta.
T.-Nom apple-Acc eat coffee-Acc drink-Formal-Past
'Taroo ate an apple and drank coffee.'

(23) Taroo-ga ringo-o tabe-**masi-te** koohii-o nomi-masi-ta.
T.-Nom apple-Acc eat-**Formal-ing** coffee-Acc drink-Formal-Past
'Taroo ate an apple and then drank coffee.'

In (22), the suffix *–mas* does not appear in the first conjunct, and the example is grammatical. Although it appears on the second verb, this is not a problem, because it is located above the coordinate structure as depicted in (24).

(24) [$_{IP}$ Taroo [$_{FP}$[$_{VP}$[$_{VP}$ apple eat]&[$_{VP}$ coffee drink]] *–mas*] *–ta*]

In (23), *-mas* appears in the participial form of the verb, below the suffix *–te*. If Nakatani (2004) is right in arguing that the latter morpheme is a variant of the tense morpheme *–ta*, the grammaticality of the example is compatible with the observation that *–mas* is located below IP.

7.4 Apparent Arguments against the VP Coordination Analysis

In the preceding section, we have seen two serious problems for the proposal that what is called Japanese VP coordination in this thesis is actually IP coordination. Although those problems already urge us to favor the VP coordination analysis, we have to take one more step before we conclude that the VP coordination analysis is really the right analysis: Because several arguments against the VP coordination analysis are found in the literature, it is necessary to examine them and show that they are not convincing. This is the aim of this section.

7.4.1 Nominative subjects

The first argument against the VP coordination analysis comes from the fact that in the coordinate structure at issue, each conjunct may have its own nominative subject. An example illustrating this is given below:

(25) **Taroo-ga** ringo-o tabe & **Hanako-ga** koohii-o nonda.
T.-Nom apple-Acc eat **H.-Nom** coffee-Acc drank
'Taroo ate an apple and Hanako drank coffee.'

If each conjunct is VP and there is only one I^0/T^0 above the coordinate VP, as conceived in the VP coordination analysis, how can the two nominative subjects be both licensed (cf. Chung 2005; see also Tomioka 1993)?

A fact overlooked in this line of argument is that Japanese independently allows for multiple nominative constructions where coordination is not involved, as illustrated below (see Fukui 1986 and references therein):

(26) *Multiple nominative construction*

Hiroshima-ga huyu-ga kaki-ga oisii.

H.-Nom winter-Nom oyster-Nom is:delicious

'In Hiroshima, oysters are delicious in winter.' (Fukui and Sakai 2003: 354)

This fact shows that, if nominative Case licensing relies on the existence of I^0/T^0 in Japanese (for example, Takezawa 1987 and Ura 2000; for a different view, see Fukui 1986, Fukui and Sakai 2003, Fukui and Takano 1998, Saito 1983, Kuroda 1965, 1978, 1983, among others), a single occurrence of this functional head is capable of licensing multiple occurrences of nominative Case. Thus, an example like (25), where multiple nominative subjects appear, does not pose a special problem for the VP coordinaiton analysis.[5]

[5] Suppose nominative Case is licensed by I^0/T^0 through (pure) Agree in Japanese (but see the references cited in the text and Harada 2002 for different approaches to case marking in Japanese). Because of the following condition discussed in Chapter 6, the nominative subject in the first conjunct in (25) cannot Agree with the I^0/T^0 head:

(i) *Condition on Agree in coordination*
A Probe outside a coordinate structure cannot Agree with a Goal in the "less close" conjunct when the "closer" conjunct also contains a potential Goal.

7.4.2 Focus and topic phrases

The second argument against the VP coordination analysis is based on the observation that in the coordinate structure at issue, each conjunct may contain a focus phrase or a topic phrase (Tomioka 1993), which is shown by the following sentences:

(27) **Natu-ga** biiru-ga umaku & **huyu-ga** atukan-ga umai.
summer-Nom beer-Nom tasty **winter-Nom** hot:sake-Nom tasty
'It is in summer that beer tastes good and in winter that hot sake tastes good.'
(Tomioka 1993: 487)

(28) **Pat-wa** Chris-ga korosi & **kane-wa** Terry-ga ubatta.
P.-Top C.-Nom killed **money-Top** T.-Nom stole
'Pat, Chris killed and the money, Terry stole.' (ibid.: 487)

If focus phrases and topic phrases are licensed in the domain higher than IP (Rizzi 1997, among many others), the size of the coordination involved in (27)/(28) must be larger than IP.

Recently, several researchers have claimed that there is a Topic/Focus position in the VP (or *v*P) periphery (see, for example, Belletti 2004 and Jayaseelan 2001). Given this claim, the above argument is not convincing enough to reject the VP coordination analysis. In fact, in the absence of independent evidence that focus or topic phrases are licensed in the domain higher than IP *in Japanese*, we can rather take the above data to

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Of course, the grammaticality of (25) falls into place if the subject in question is assigned a default Case and the default Case in Japanese is nominative as claimed by Fukui (1986) and Saito (1983).

indicate that those phrases can appear within VP in the language, lending support to the "Topic/Focus position in the VP/*v*P periphery" hypothesis.

7.4.3 Sentential adverbs

The next argument against the VP coordination analysis involves sentential adverbs. As the following example shows, in the coordinate structure at issue, each conjunct may contain a sentential adverb (Tomioka 1993, Yoshihisa Kitagawa, personal communication):

(29) Chris-ga **kitto** Pat-o korosi & Terry-ga **tabun** kane-o ubatta.
C.-Nom **surely** P.-Acc killed T.-Nom **perhaps** money-Acc stole
'Surely Chris killed Pat and perhaps Terry stole the money.'

(Tomioka 1993: 486)

If sentential adverbs are licensed by some functional heads, as argued by Cinque 1999, among many others, the conjuncts in (29) must be larger than VP.

A flaw in this argument is that, as sentences like the following show, conjuncts smaller than IP/CP can contain a sentential adverb (Collins 1987, quoted in Munn 1993: 159ff.):

(30) John and **perhaps** Bill went to the store. (Munn 1993: 160)

In this sentence, the conjuncts are NPs/DPs and no doubt smaller than IP/CP, but contain a sentential adverb with no problem.

One might claim that a sentence like this should be analyzed as involving IP/CP coordination and backward deletion, as shown below (cf. Wilder 1997, among others):

(31) *IP/CP-coordination-and-backward-deletion analysis of (30)*

John ~~went to the store~~ and perhaps Bill went to the store.

This objection, however, does not carry weight with the following sentence:

(32) Two Harvard students and **perhaps** one MIT student met at Harvard Square station.

The alleged syntactic representation for this sentence under the IP/CP-coordination-and-backward-deletion analysis should be as in (33), which is ill-formed due to the lexical property of the verb *meet*.

(33) *Two Harvard students ~~met at the Harvard Square station~~ and perhaps one MIT student met at Harvard Square station.

I speculate that the above sentences illustrate the parenthetical use of the sentential adverbs (see, for example, Alexiadou 1997). Whether this is a correct explanation or not, however, what is important here is that examples like (29) do not favor the IP coordination analysis over the VP coordination analysis.

7.4.4 Tense interpretation

The last argument against the VP coordination analysis comes from the fact that the first conjunct of the coordinate structure at issue can be interpreted to have an independent

tense when a temporal expression is present (Tomioka 1993; see also Chung 2005). Consider the following example:

(34) **Kinoo** Chris-ga kaeri & **asita** Pat-ga kaer-**u**.
yesterday C.-Nom retrun **tomorrow** P.-Nom return-**Nonpast**
'Chris returned yesterday and Pat will return tomorrow.' (Tomioka 1993: 487)

Here, the second verb carries the nonpast tense suffix, but the first verb, which is in its bare form, can be construed with the adverb *kinoo* 'yesterday' and have a past tense interpretation. The ill-formedness of the following example shows that the first conjunct in the above example does not share the nonpast tense with the second conjunct:

(35) ***Kinoo** Chris-ga kaer-**u**.
yesterday C.-Nom return-**Nonpast**
'Chris returns yesterday.'

It appears that under the VP coordination analysis, the two conjuncts in examples like (34) should have the same tense because they are governed by a single I^0/T^0. Thus, the fact that the two conjuncts may have different tense interpretations appears to be a problem.

However, this fact is not necessarily a problem. First, let us adopt the following assumption:

(36) In order to receive a right tense interpretation, a verb must enter into an Agree relation with I^0/T^0 (Pesetsky and Torrego 2004).[6]

Under this assumption, the asymmetrical tense interpretation seen above can be considered to be a result of failure of I^0/T^0 to Agree with the verb in the first conjunct (or the head of the first conjunct):

(37) … $[_{VP}$ … $V^0]$&$[_{VP}$ … $V^0]$ … I^0/T^0

	ok
*	

This situation is reminiscent of the phenomenon called "first conjunct agreement," in which when a verb precedes a subject coordinate NP, the verb fails to agree with the second conjunct NP, or the head of the second conjunct NP (see Aoun, Benmamoun, and Sportiche 1994, 1999, Johannessen 1996, Munn 1993, 1999a, among many others). The following example illustrates it:

(38) *First conjunct agreement*

There is / ??are [a man and three children] at the front door.

(Progovac 2003: 246)

(39) … I^0/T^0 $[_{NP}$ N^0 …]&$[_{NP}$ N^0 …] …

ok	
*	

[6] Pesetsky and Torrego (2004) take "T-chains" of Guéron and Hoekstra (1995) as cases of the agreement relation.

In both (34)/(37) and (38)/(39), the head I^0/T^0 fails to Agree with the head of the "less close" conjunct, and in this sense, they can be regarded as subcases of a single phenomenon, "closer conjunct agreement." As long as this unification is plausible, the asymmetrical tense interpretation seen in (34) above does not pose any special problem for the VP coordination analysis: Whatever analysis of first conjunct agreement turns out to be correct, it can be extended to the tense agreement case.[7]

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[7] I suggest that some version of the condition in (i) below, which is discussed in Chapter 6, plays a crucial role in explanation of closer conjunct agreement.

(i) *Condition on Agree in coordination*
A Probe outside a coordinate structure cannot Agree with a Goal in the "less close" conjunct when the "closer" conjunct also contains a potential Goal.

However, I do not try to give a full analysis here. There are some intricacies in the phenomenon which would take us too far afield. For example, closer conjunct agreement does not occur when the conjoined phrase ends up appearing higher than the agreeing head (see the references cited in the text; the acceptability judgments in (ii) are based on the results of an experiment reported in Sobin 1997).

(ii) a. ?*A key and six coins is on the desk.
b. ??Some plates and a bowl is on the table. (Sobin 1997: 341)

The following English example shows that the tense agreement case of closer conjunct agreement is not universal:

(iii) *John will [$_{VP}$ open the window tomorrow] and [$_{VP}$ close the door yesterday].

In this connection, it should be noted that the subject agreement case of closer conjunct agreement is not always obligatory, as shown by the following Russian example:

(iv) *Russian*
V komnatu vošli/vošla/*vošel /*vošlo molodaja ženščina i
into room entered-Pl/Sg.F/Sg.M/Sg.N young woman-F.Nom and
malen'kij mal'čik.
little boy-M.Nom
'Into the room entered a young woman and a small boy.'
(Babyonyshev 1997, quoted in Progovac 2003: 247)

The tense agreement pattern in English (iii) and that in Japanese (34) are parallel with the plural agreement and the singular feminine agreement in (iv), respectively. Here I only speculate that in the latter cases, some sort of feature percolation takes place. I leave further exploration of the parallelism for future research, too.

7.4.5 Summary

In this section we have seen that none of the alleged arguments against the VP coordination analysis is convincing. Thus, given the serious problems for the IP coordination analysis discussed in the preceding section, it seems now safe to conclude that the VP coordination analysis is more plausible, and that the coordination involved in sentences like (40) is VP coordination.

(40) Taroo-ga kesa ringo-o tabe sakuban koohii-o non-da.
T.-Nom this:morning apple-Acc eat last:night coffee-Acc drink-Past
'Taroo ate an apple this morning and drank coffee last night.'

Furthermore, the above discussion confirms that the acceptability of examples like (11), repeated below, where the first object is scrambled across the subject, should be explained based on the optionality of subject raising in Japanese, as discussed in section 7.2 (see (3)):

(41) *Scrambling of the first object*
(?)Taroo-o_i Yamada kyoozyu-ga t_i home & Hanako-o sikatta.
T.-Acc Y. prof.-Nom praise H.-Acc scolded
'Taroo, Prof. Yamada praised and scolded Hanako.'

Thus, to the extent that our discussion so far is on the right track, the acceptability of this example constitutes evidence that subject raising is optional in Japanese (contra, for example, Kishimoto 2001, Nemoto 1993 and Watanabe 1996). This conclusion has an important theoretical implication beyond the syntax of Japanese.

7.5 An Implication: the Universality of the Traditional EPP

Recently, several researchers have argued that the traditional EPP, or the EPP on I^0/T^0 is universal (see, for example, Alexiadou and Anagnostopoulou 1998, Bailyn 2004, Chomsky 2000, Miyagawa 2001, 2003). In particular, Alexiadou and Anagnostopoulou (1998) claim that (i) the EPP is universal; (ii) it is checked by V-to-I raising in *pro*-drop languages with rich verbal morphology; and (iii) otherwise, it is checked by subject raising to Spec,IP. This claim predicts that Japanese, which is a *pro*-drop language but lacks rich verbal morphology, makes use of subject raising to check the EPP (see, for example, Fukui and Sakai 2003 for arguments against V-raising in Japanese). Miyagawa (2001, 2003) argues that raising of the object to Spec,IP is another option to check the EPP in Japanese (and this raising is what has been traditionally called scrambling).

The acceptability of examples like (41), where all the arguments remain within VP, casts doubt on the universality of the EPP, suggesting that the emergence of this feature on I^0 is parameterized, as also claimed by Bobaljik and Wurmbrand (2005) and McCloskey (2001) (see Hirata 2006 for a related discussion).[8,9]

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[8] Cedric Boeckx (personal communication) pointed out to me the possibility that in (41), the EPP is checked by VP-raising to Spec,IP, as proposed for verb-initial languages (cf. Chung 2005 and references cited therein; cf. also Kayne 1994). The asymmetrical tense interpretation in Japanese VP coordination seen above suggests that this alternative is questionable. Recall that the first conjunct of Japanese VP coordination can be interpreted to have an independent tense when a temporal expression is present, and that this stems from failure of I^0/T^0 to Agree with the head of the conjunct, a subcase of "closer conjunct agreement." As mentioned in footnote 7, when a coordinated phrase appears higher than a head which Agrees with it, closer conjunct agreement is not allowed. If this is a correct descriptive generalization, the VP-raising analysis should predict that an example in which Spec,IP is not occupied by an argument (i.e., by the subject or the object) does not exhibit an asymmetrical tense interpretation, because under this analysis, the coordinated VP is located in Spec,IP, higher than I^0. This prediction is not borne out, as shown by example (34), repeated below:

(i) **Kinoo** Chris-ga kaeri & **asita** Pat-ga kaer-**u**.
yesterday C.-Nom retrun **tomorrow** P.-Nom return-**Nonpast**
'Chris returned yesterday and Pat will return tomorrow.'

As seen above, in this example the two predicates are assigned different tense interpretations, but nothing occupies Spec,IP. Note that one cannot assume that the first subject *Chris* has raised to Spec,IP in apparent violation of the CSC, because even if the possible CSC violation can be evaded by assuming that the raised subject can be totally reconstructed (see section 2.2.2 of Chapter 2), in the resulting structure, the temporal adverb *kinoo* would take scope over the other temporal adverb *asita* and the head of IP specified as Nonpast (-Pst), inducing a tense conflict:

(ii) $[_{IP}$ yesterday $[_{IP}$ Chris$_i$ $[_{VP}$ t_i return]&$[_{VP}$ tomorrow Pat return] I^0-Pst]]

[9] Examples like (41) also constitute a counterexample to the generalization suggested in Alexiadou and Anagnostopoulou 2001 that whenever a sentence contains both a subject and a direct object, one of the arguments must vacate the VP.

Chapter 8
Summary

This thesis has been an attempt to examine the nature of the CSC, addressing the issue of at which level in the grammar this constraint applies, and to consider implications of the results obtained from the examination for the theory of grammar. Below I summarize the discussion in each preceding chapter.

In Chapter 2, I compared the derivational approach and the LF representational approach to the CSC, arguing that the latter is more plausible. The LF Representational CSC which I argued for is formulated as follows:

(1) *LF Representational CSC*

a. A sentence with a coordinate structure is well-formed only if each of its component structures independently satisfies grammatical constraints.

b. Component structures of a sentence with a coordinate structure $=_{def}$ structures each of which is composed of one of the conjuncts together with the material which is not included by the coordinate structure.

Under this approach, CSC effects are attributed ultimately to constraints on LF representations proposed independently of coordination (for example, the ban on vacuous

quantification, the Theta-Criterion, and the aboutness condition). In this sense, there is no independent “CSC” in this approach. We saw two types of supporting evidence in favor of it. The first type comes from covert quantificational movement (QR and *wh*-movement) and Gapping sentences, showing that in certain cases, a non-ATB movement can occur without inducing CSC effects: QR and covert *wh*-movement can occur from one of the conjuncts when the other conjunct contains a pronoun coreferential with the QRed/*wh*-moved phrase (section 2.2.1); the subject of the first VP conjunct in a Gapping sentence can raise to Spec,IP in apparent violation of the CSC because it undergoes (total) reconstruction to its base position (section 2.2.2). The second type of evidence for the Representational CSC comes from topic and relative clause constructions in Japanese, indicating that in certain cases, a CSC effect can appear even when no movement occurs: Even though those constructions do not involve movement, as evidenced by the fact that they can be gapless, that they do not exhibit subjacency effects, that a coordinated NP relative head and topic can be associated with multiple gaps, that they do not exhibit reconstruction effects, and that adjunct relativization is clause-bounded (section 2.2.3.1), they exhibit CSC effects (section 2.2.3.2).

In Chapter 3, I discussed one important theoretical implication of the LF nature of the CSC for Japanese syntax. It has been widely believed that Japanese scrambling is a semantically vacuous operation and as such can undergo total reconstruction at LF. However, some thought revealed that in the current theoretical setting, there seems to be no reason, empirical or conceptual, to believe that the reconstruction which Japanese scrambling can undergo is total, rather than partial (section 3.2.2). Rather, there seems to be a conceptual reason to believe the opposite (section 3.2.3). The alleged total

reconstruction property, in conjunction with the LF nature of the CSC, leads us to predict that Japanese scrambling does not exhibit CSC effects, but this prediction is not borne out (section 3.3). Given this result, I claimed that the type of reconstruction available to Japanese scrambling is partial reconstruction, proposing the following hypothesis (section 3.4):

(2) *Partial reconstruction hypothesis on Japanese scrambling*

Scrambled phrases may undergo partial reconstruction in Japanese. Semantic features (e.g., features relevant to binding and scope) can be reconstructed, or deleted in the moved positions at LF, while formal features (e.g., phi- and categorial features) cannot.

Miyagawa (2005a) proposes a theory of reconstruction of scrambled phrases which amounts to claiming that total reconstruction is possible only when the scrambling is not motivated by any universal principles. However, it was shown that even where he claims scrambled phrases undergo total reconstruction, CSC effects can be detected. Thus, I concluded that Japanese scrambling cannot undergo total reconstruction *in any environment* (section 3.5).

The aim of Chapter 4 was to provide another piece of empirical evidence for the LF Representational CSC. We first observed that when no NCI or quantifier phrase appears above a coordinated VP, a negative marker attached to the second verb cannot take scope over the entire coordinate structure, its scope being limited within the second conjunct (section 4.1). Next we observed that when a component structure of a sentence contains an NCI, it must also contain Neg (section 4.2). We further observed that when

Neg appears on the second verb and an NCI appears above the coordinate structure, the sentence is acceptable. These observations led us to the generalization that Neg can appear above a coordinated VP only when there is an NCI above the coordinated VP which needs to be licensed by the Neg. I proposed capturing this generalization by claiming that Neg is base-generated within VP and may undergo raising as a last resort in Japanese (section 4.3.1). Neg-raising can occur as a last resort not only to license an NCI, but also to create a new scope relation (section 4.3.2). Given this last resort nature of the Neg-raising in Japanese, we cannot help concluding that the operation occurs only from the second conjunct in a sentence with the configuration of "NCI … [$_{VP}$ …… V]&[$_{VP}$ …… V] Neg." Such Neg-raising should be blocked under the derivational view of the CSC, whereas it is permitted under the representational view of the constraint, as long as it does not result in an operator-variable chain (section 4.4).

In Chapter 5, I examined the view that CSC effects are to be accounted for in terms of the PF interface. After providing a concrete formulation of the PF account of CSC effects (section 5.1), I first pointed out several empirical problems with this line of approach (section 5.2), and then examined some data which appear to be explained under the PF approach but not under the LF approach, claiming that they pose no real problem for the latter approach (section 5.3). The empirical problems with the PF approach can be classified into two groups. The first group arises from cases where no overt movement occurs but a CSC effect is detected (section 5.2.1). The second group arises from cases where not all conjuncts contain an unpronounced copy of a moved element but no CSC effect is detected (section 5.2.2). None of these cases gives rise to a problem for the LF approach. The second group of the problems for the PF approach is also problematic for

the idea that the CSC is a sort of overarching constraint which applies both at the LF and the PF interface (sections 5.2.1.4 and 5.2.2). One argument which appears to favor the PF approach comes from the observation that CSC violations are repaired under Sluicing. This line of argument is not convincing, since there is a possibility that the sluiced part of the sentence does not contain a coordinate structure (section 5.3.1). Another class of apparent arguments for the PF approach concerns contrasts between topicalization and left dislocation. These arguments are not strong enough to reject the LF approach for various reasons (section 5.3.2).

In Chapter 6, I took up the issue of why Japanese, but not English, allows for the ATB distribution of in-situ *wh*-phrases. In English, if the feature movement or the covert phrasal movement approach to *wh*-in-situ is adopted, the ATB distribution of in-situ *wh*-phrases leads to a violation of the CSC (section 6.3.1). On the other hand, if the Agree approach is adopted, it leads to a violation of the CSC (section 6.3.2.1) or failure of the $C_{[+Q]}$ to Agree with the *wh*-phrase in the second conjunct due to the following condition (section 6.3.2.2):

(3) *Condition on Agree in coordination*

A Probe outside a coordinate structure cannot Agree with a Goal in the “less close” conjunct when the “closer” conjunct also contains a potential Goal.

This condition forces us to assume that ATB movement should be analyzed as an instance of sideward movement (section 6.3.2.3). The reason why Japanese permits ATB distribution of in-situ *wh*-phrases is that it makes use of null operator movement to license *wh*-in-situ. This makes it possible that ATB movement of a null operator takes

place in sentences each of whose conjuncts contains an in-situ *wh*-phrase (section 6.4). The two of the theoretical implications of my analysis are (i) that no LF movement of the residue of a *wh*-phrase occurs (section 6.5.1.1) and (ii) that *wh*-adjuncts, as well as *wh*-arguments, make use of null operator movement (section 6.5.1.2). Two of the issues I left open are concerned with (i) D-linked *wh*-phrases (section 6.5.2.1) and (ii) some judgmental variation among English speakers (section 6.5.2.2).

Chapter 7 was devoted to showing that the subject does not have to raise to Spec,IP and can remain within VP in Japanese. Evidence for this comes from the fact that scrambling of the object in the first VP conjunct, but not that in the second VP conjunct, across the subject does not result in a violation of the CSC (section 7.2). Although one might claim, in order to deal with this fact without assuming the optionality of subject raising in Japanese, that what is called Japanese VP coordination here should be analyzed as IP coordination, I provided two arguments against such an IP coordination analysis (section 7.3). I further examined several apparent arguments against the VP coordination analysis, showing that none of them is convincing (section 7.4). Recently, several researchers have argued that the traditional EPP, or the EPP on I^0/T^0 is universal, but if the discussion in this chapter is on the right track, it suggests that this is not the case (section 7.4).

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