FOCUS AND *WH*-FEATURES IN INTERROGATIVE C *

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1. Introduction

In Japanese, word order is relatively free. For example, both SOV and OSV orders are possible, as shown in (1).

(1) a. Taroo-ga hon-o kat-ta
-Nom book-Acc buy-Past

'Taroo bought a book.'

b. Hon$_i$-o Taroo-ga t_i kat-ta
book-Acc -Nom buy-Past

'Taroo bought a book.'

The OSV order in (1b) is derived by scrambling (see Saito 1985, among others) of the object to the sentence initial position without changing the meaning of the sentence. Thus, it is widely assumed that scrambling is not feature-driven, so that it applies freely (see Saito 1985, 1989, Fukui 1986, Kuroda 1988, Saito and Fukui 1998 among many others).[1]

Besides this optionality, one of the most remarkable properties of scrambling is that scrambling undergoes "LF-undoing" (Saito 1989), or "radical reconstruction." Saito (1989) offers a convincing illustration of the radical reconstruction effect, based on the generalization that *wh*-phrases must be c-commanded by a Q-morpheme (Harada 1972). First, look at the examples in (2).

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[1] Alternatively, Miyagawa (1997, 2001), Kitahara (1997), and Kawamura (2001) argue that scrambling is in fact feature-driven.

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(2) a. [$_{TP}$ Taroo-ga Hanako-ni [$_{CP}$ [$_{TP}$ dare-ga ku-ru] ka] osie-ta]
-Nom -to who-Nom come-Pres Q teach-Past

'Taroo told Hanako who is coming.'

b. * [$_{TP}$ Taroo-ga dare-ni [$_{CP}$ [$_{TP}$ Hanako-ga ku-ru] ka] osie-ta]
-Nom who-to -Nom come-Pres Q teach-Past

'(Lit.) Taroo told who Hanako is coming.'

In (2a), the *wh*-phrase *dare* 'who' is c-commanded by the Q-morpheme *ka*, and the sentence is grammatical. On the other hand, in (2b), the *wh*-phrase is outside of the c-command domain of the Q-morpheme. Hence, Harada's (1972) generalization can correctly rule out the example in (2b). Then, look at the examples in (3).

(3) a. [$_{TP}$ Taroo-ga [$_{CP}$ [$_{TP}$ Hanako-ga nani-o kat-ta] ka] siritagatteir-u]
-Nom -Nom what-Acc buy-Past Q want-to-know-Pres

'Taroo wants to know what Hanako bought.'

b. ? [$_{TP}$ Nani$_i$-o Taroo-ga [$_{CP}$ [$_{TP}$ Hanako-ga t_i kat-ta] ka] siritagatteir-u][2]
what-Acc -Nom -Nom buy-Past Q want-to-know-Pres

'Taroo wants to know what Hanako bought.'

The sentence in (3b) is derived from (3a) by long-distance scrambling of the *wh*-phrase *nani* 'what' to the matrix clause. Surprisingly, this sentence is grammatical, although the *wh*-phrase is not c-commanded by the Q-morpheme at S-structure. Based on this observation, Saito (1989) argues that the generalization applies at LF and scrambling can be undone at LF, so that the *wh*-phrase goes back to its trace position, which the Q-morpheme c-commands.

In this regard, it is expected that there is no restriction on word order alternations in Japanese, as long as they are derived by scrambling. This expectation, however, is not correct. Look at the contrast found in (4), which is called the "anti-superiority" effect (see A. Watanabe 1991, S. Watanabe 1994, and Saito 2004, among others).

(4) a. *Naze Taroo-ga nani-o kat-ta no?
why -Nom what-Acc buy-Past Q

'Why did Taroo buy what?'

[2] Saito (1989) attributes the marginal status of (3b) to Subjacency, since the scrambled *wh*-phrase is moved out of a *wh*-island. In any event, what is important here is that there is clear contrast between (2b) and (3b).

b. Nani$_i$-o naze Taroo-ga t_i kat-ta no?
what-Acc why -Nom buy-Past Q

'Why did Taroo buy what?'

In (4a), *naze* 'why' precedes *nani* 'what', and the sentence is ungrammatical. On the other hand, in (4b), *nani* 'what' precedes *naze* 'why' as a result of scrambling, and the sentence is grammatical.[3] Given that *in-situ wh*-phrases moves at LF (Huang 1982), this is unexpected under the assumption that scrambling is undone at LF; since radical reconstruction forces the examples in (4) have the same LF representation, the contrast is left unexplained. Note that only *naze* 'why' induces the anti-superiority effect; multiple *wh*-questions are in fact possible without restriction on ordering.[4]

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[3] Given that a subject cannot be scrambled (Saito 1985), the fact that the object *wh*-phrase *nani* 'what' precedes the subject *Taroo* ensures that it undergoes scrambling, though we leave the precise position of *naze* 'why' open at this point.

[4] The name "anti-superiority" comes from superiority phenomena. The relevant examples are the following;

(i) a. Who$_i$ t_i bought what?

b. * What$_i$ did who buy t_i?

(ii) a. Why$_i$ did John buy what t_i?

b. * What$_i$ did John buy t_i why?

If the lower *wh*-phrase moves first, the sentence becomes ungrammatical. Therefore, Chomsky (1973) proposes the following condition.

(iii) *Superiority Condition*
No rule can involve X, Y in the structure
… X … [$_\alpha$ … Z … -WYV …]…
where the rule applies ambiguously to Z and Y and Z is superior to Y.

As we have seen, contrary to the English case which rules out *wh*-'why' order, Japanese allows only this order. Thus, this phenomenon is called "anti-"superiority. Japanese, however, shows some peculiar pattern to this condition. Look at the examples in (iv).

(iv) a. Dare-ga nani-o kat-ta no?
who-Nom what-Acc buy-Past Q

'Who bought what?'

b. Nani$_i$-o dare-ga t_i kat-ta no?
what-Acc wh-Nom buy-Past Q

'(Lit.) What did who buy?'

A similar pattern is found in the following contrast in (5), which is called the intervention effect by scope bearing elements, henthforth SBEs (see Beck 1996, Beck and Kim 1997).[5]

(5) a. *Hanako-sika nani-o yoma-nakat-ta no?[6]
-only what-Acc read-not-Past Q

'What did only Hanako read?'

b. Nani$_i$-o Hanako-sika t_i yoma-nakat-ta no?
what-Acc -only read-not-Past Q

'What did only Hanako read?'

The contrast in (5) suggests that *nani* 'what' cannot follow the NPI *-sika* 'only'. Again, this word order restriction on SBEs and *wh*-phrases is not expected, because this word order alternation is derived by scrambling.

One interesting exception of the intervention effect is the following case, where an SBE co-occurs with *naze* 'why'.

(6) a. Taroo-ga naze sono hon-sika yoma-nakat-ta no?
-Nom why that book-only read-not-past Q

'Why did Taroo read only that book?'

b. Taroo-ga sono hon-sika$_i$ naze t_i yoma-nakat-ta no?
-Nom that book-only why read-not-Past Q

'Why did Taroo read only that book?'

In this case, both of the 'why'-SBE order and the SBE-'why' order are allowed. Note that only *naze* 'why' can escape the intervention effect. Again, *naze* 'why' shows different behavior from the other *wh*-phrases.

The anti-superiority effect, the intervention effect, and the exception of the intervention effect are schematically summarized as in (7).

These examples indicate that both orders are possible. That is, anti-superiority in Japanese is not totally opposite to superiority in English. Although the term anti-superiority is a little bit confusing, we continue to use it to refer to the fact that 'why'-*wh* order induces ungrammaticality.

[5] SBEs include *-sika* 'only', *-mo* 'also', *daremo* 'anyone', *dareka* 'someone', *daremo* 'everyone'. In this paper, we use the Negative Polarity Item (henthforth NPI) *-sika* 'only' because it induces the most salient effect.

[6] Ko (2006) illustrates that Korean shows the same pattern of grammaticality with respect to the examples which this paper provides. Because of the space limitation, we deal with only Japanese examples here. We, however, believe that the same explanation holds in the Korean counterparts.

(7) a. *[… 'why' … *wh* …] vs. [ok][… *wh* … 'why' …] : anti-superiority

b. *[… SBE … *wh* …] vs. [ok][… *wh* … SBE …] : intervention effect

c. [ok][… 'why' … *wh* …] vs. [ok][… *wh* … 'why' …] : exception of intervention

Here, three questions arise;

(8) a. Why the surface order of *wh*-phrases and SBEs is crucial to the grammaticality of a sentence, given the optionality and the radical reconstruction property of scrambling?

b. Why does *naze* 'why' behave differently from the other *wh*-phrases?

c. Why do SBEs induce the intervention effect?

Recently, Ko (2005) provides an answer to (8b); she claims that the peculiar behavior of *naze* 'why' with respect to the intervention effect follows from the hypothesis that *naze* 'why' is base-generated into Spec, CP. Subsequently, Ko (2006) extends the analysis to the anti-superiority effect, assuming the split-CP system (see Rizzi 1997, 1999 especially). In this paper, however, we show that Ko's analysis does not make sense if the question in (8a) is taken seriously, because her analysis overlooks the properties of scrambling.

Alternatively, we claim that the ungrammatical cases are ruled out as illicit cases of valuation of unvalued features on C. In so doing, we first answer the question in (8b), claiming that *naze* 'why' is different from the other *wh*-phrases in its feature specification; the ordinary *wh*-phrases have a focus feature whereas *naze* 'why' lacks it. Then, we propose a feature valuation mechanism, which crucially employs Pesetsky and Torrego's (2004) claim that valuation of features is independent of interpretability of them, and illustrate how the proposed mechanism exclude the ungrammatical cases, answering the question in (8c). More over, we argue that although the proposed mechanism can provide a partial answer to (8a), it is necessary to assume Nissenbaum's (2000) idea that all overt operations precede covert ones within a certain domain, coupled with Richards' (2001) tucking-in theory, to give a full answer to (8a): On the one hand, Pesetsky and Torrego's proposal excludes the possibility of scrambling before feature checking; on the other hand, Nissenbaum's theory makes scrambling after covert feature checking impossible because by definition, scrambling is an overt operation. In addition, tucking-in ensures that overt movement of multiple *wh*-phrases to Spec, CP preserves the order of relevant constituents.

This paper is organized as follows. In Section 2, we briefly review the analysis by Ko (2005, 2006) and point out several problems of the analysis. In Section 3, we first recapture what we have to explain by making a generalization, and briefly argue that the split-CP system cannot explain the generalization contrary to Ko's analysis. Then, we provide an analysis. Section 4 illustrates that the proposed analysis can cover the more complex cases.

Finally, in Section 5, after summarizing this paper, we speculate the status of the Ko's hypothesis and the split-CP hypothesis.

2. Previous Analysis and Problems

2.1 CP-Modifier Hypothesis

In this subsection, we review the analysis by Ko (2005) as a first step. First, Ko (2005) claims that the ungrammatical SBE-*wh* order can be ruled out by assuming the Intervention Effect Constraint (Beck and Kim 1997) stated in (9).

(9) *Intervention Effect Constraint*
At LF, a *wh*-phrase cannot move across an SBE to its checking (scope) position.

a. *[… Q … SBE … *wh* …][7]

b. ok[… Q … wh_i … SBE … t_i …] (slightly modified from Ko 2006, p.321)

This constraint can rule out the example in (5a). Note that scrambling of the *wh*-phrase over the SBE is possible, since scrambling does not involve feature checking. Thus, even if a *wh*-phrase is base-generated below an SBE, it can enter the checking relation with Q as long as it is preposed by scrambling, as in (9b).

On the other hand, as we have seen above, *naze* 'why' seems to be exempt from the Intervention Effect Constraint. Ko (2005), however, points out that in some circumstances, *naze* 'why' is also subject to the Intervention Effect Constraint. Look at the examples in (10).

(10)a. Hanako-ga [$_{CP}$ Taroo-ga naze kur-u to] it-ta no?
-Nom -Nom why come-Pres C say-Past Q

'What is the reason x such that Hanako said that Taroo is coming for x?'

b. *Hanako-sika [$_{CP}$ Taroo-ga naze kur-u to] iwa-nakat-ta no?
-only -Nom why come-Pres C say-not-Past Q

'What is the reason x such that Hanako said that Taroo is coming for x?'

The example in (10a) indicates that *in-situ wh*-phrase *naze* 'why' can take matrix scope. In contrast, if the matrix subject is replaced to the SBE *Hanako-sika* 'only Hanako' as in (10b), the embedded *naze* 'why' cannot take matrix scope, and the sentence become ungrammatical. In this case, the example in (10b) has the following LF representation.

[7] Checking relation is indicated by dashed lines, regardless whether movement is involved or not.

(11) $[_{CP}$ Q $[_{TP}$ … SBE … $[_{CP}$ … 'why' …]]]

This structure is straightforwardly ruled out by the Intervention Effect Constraint, since the *wh*-phrase has to move across the SBE to the matrix interrogative C. Based on this fact, Ko (2005) claims that the exceptional behavior of *naze* 'why' is limited to its clause-internal movement.

To explain this peculiar property of *naze* 'why', Ko (2005) proposes the following hypothesis;

(12) *CP-Modifier Hypothesis*
'Why' in *wh-in-situ* languages is an adverb that is externally merged in Spec, CP of the clause it modifies.

Under the CP-Modifier Hypothesis (henthforth CMH), the example in (6a), repeated here as (13a), is derived in the manner depicted in (13b).

(13)a. Taroo-ga naze sono hon-sika yoma-nakat-ta no?
-Nom why that book-only read-not-past Q

'Why did Taroo read only that book?'

b. Step 1; External merge of *naze* 'why' into Spec, CP with feature checking
$[_{CP}$ naze $[_{TP}$ Taroo-ga sono hon-sika yoma-nakat-ta] no]

Step2; Scrambling of the subject to sentence initial position[8]
$[_{CP}$ Taroo$_i$-ga naze $[_{TP}$ t_i sono hon-sika yoma-nakat-ta] no]

Then, the exceptionally grammatical 'why'-SBE order in (6b), repeated here as in (14a), has the derivation illustrated in (14b).

(14)a. Taroo-ga sono hon-sika naze yoma-nakat-ta no?
-Nom that book-only why read-not-Past Q

'Why did Taroo read only that book?'

[8] Note that contra Saito (1985), scrambling of subject must be possible under the CMH, as argued by Ko (2005). See Ko (2005, Section 7.1) for the relevant discussion.

b. Step 1; External merge of *naze* 'why' into Spec, CP with feature checking
[$_{CP}$ naze [$_{TP}$ Taroo-ga sono hon-sika yoma-nakat-ta] no]

Step 2; Scrambling of the subject and the SBE before *naze* 'why', respectively
[$_{CP}$ Taroo$_i$-ga sono hon-sika$_j$ naze [$_{TP}$ t_i t_j yoma-nakat-ta] no]

What is crucial here is that scrambling of the SBE takes place after feature checking of *naze* 'why' with Q. Therefore, the SBE does not interfere in the checking relation, as long as *naze* 'why' is merged into an interrogative CP. In this way, Ko (2005) explains the exceptional behavior of *naze* 'why' with respect to the intervention effect, attributing it to the base-generated position of *naze* 'why'. In other words, Ko (2005) answers to the question in (8b) by claiming only *naze* 'why' can be base-generated into Spec, CP whereas the other *wh*-phrases are not.

The anti-superiority effect, however, causes a problem to the analysis. The relevant example (4a) is repeated as (15).

(15) *Naze Taroo-ga nani-o kat-ta no?
why -Nom what-Acc buy-Past Q

'Why did Taroo buy what?'

The derivation of the example in (15) under the CMH is schematically illustrated in (16).

(16)a. Step 1; Feature checking between the *wh*-phrase and Q
[$_{CP}$ Q [$_{TP}$ … *wh* …]]

b. Step 2; External merge of *naze* 'why' into Spec, CP with feature checking
[$_{CP}$ 'why' Q [$_{TP}$ … *wh* …]

At the Step 1 in (16a), nothing prevents the *wh*-phrase entering a checking relation with the interrogative C. Subsequently, 'why' is merged into Spec, CP with feature checking. Thus, the derivation can converge, contrary to the fact.

In addition, Ko herself noticed that her explanation has another problem. Look at the example in (17a), where the SBE and the *wh*-phrase precede *naze* 'why'.

(17)a. ?*Taroo-sika nani-o naze tabe-nakat-ta no?
-only what-Acc why eat-not-Past Q

'Why did only Taroo eat what?' (Based on Ko's 2006 Korean example in p. 333)

b. [$_{CP}$ $\underline{\underline{SBE_i}}$ wh_j 'why' Q [$_{TP}$ … t_i … t_j …]]

As shown in (17b), since the SBE is adjoined to CP, it does not prevent from the *wh*-phrase from entering the checking relation with the interrogative C. Thus, the CMH wrongly rules in the example in (17a).

To avoid this problem, Ko (2006) adopts Rizzi's (1999) split-CP system. Rizzi (1999) claims that CP is a highly structured zone, as shown in (18).

(18) [Force [(Top(ic)) [Int(errogative) [(Top) [Foc(us) [(Top) [Fin(iteness) [IP …]]]]]]]]
↑ ↑
'why' *wh*-movement

Rizzi (1999) also claims that in Italian, *perchè* 'why' is base-generated in Spec, IntP, and Spec, FocP is the landing site for *wh*-movement. Following his idea, Ko (2006) proposes that in *wh-in-situ* languages, there are at least two CP-layers, namely C-Focus (C_{Foc}) and C-Interrogative (C_{Int}), where C_{Foc} dominates C_{Int}, as shown in (19).

(19) [$_{CFocP}$ … C_{Foc} [$_{CIntP}$ … C_{Int} [$_{IP}$ …]]
↑ ↑
wh-movement 'why'

Under this revised CMH, the offending example in (17a) has the schematic structure in (20).

(20) [$_{CFocP}$ C_{Foc} [$_{CIntP}$ $\underline{\underline{SBE_i}}$ wh_j 'why' C_{Int} [$_{IP}$ … t_i … t_j …]]
X

Note that in (19), the hierarchical order between C_{Foc} and C_{Int} is reversed from Rizzi's (1999) original proposal. Hence, even if *naze* 'why' is merged into Spec, C_{Int}P, as Rizzi (1999) claims, the *wh*-phrase has to move to Spec, C_{Foc}P, which is located higher than C_{Int} since Spec, C_{Foc}P is the landing site for *wh*-movement. This movement, however, is impossible since it crosses the SBE, as shown in (20). Therefore, the revised CMH can correctly rule out the case in (17a).

Given the revised CMH, Ko (2006) extends her analysis to the anti-superiority effect. In doing so, Ko (2006) claims that 'why' in Japanese and Korean is itself an SBE that induces the intervention effect. Under this analysis, the ungrammatical 'why'-*wh* order has the schematic structure in (21a), whereas the grammatical *wh*-'why' order has the structure in (21b).

(21)a. *[$_{CFocP}$ C_{Foc} [$_{CIntP}$ $\underline{\underline{\text{'why'}}}$ C_{Int} [$_{IP}$ … wh …]]]
X

b. $^{ok}[_{CFocP}\ C_{Foc}\ [_{CIntP}\quad wh_i\quad$ ‘why’ $C_{Int}\ [_{IP}\ \ldots\ \ t_i\ \ \ldots]]]$

By hypothesis, *naze* ‘why’ is base-generated in Spec, $C_{Int}P$ in both cases. In the case of (21a), the *wh*-phrase has to move Spec, $C_{Foc}P$, crossing *naze* ‘why’, while nothing intervenes between Spec, $C_{Foc}P$ and the *wh*-phrase in the case of (21b) because of scrambling. Therefore, the revised CMH, coupled with the assumption that ‘why’ induces the intervention effect, can explain the anti-superiority effect.

In this subsection, we reviewed the analysis by Ko (2005, 2006) and illustrated how the analysis explains the paradigm in (7). The next subsection, however, shows that the explanation faces serious problems when the optionality and the radical reconstruction property of scrambling are taken into consideration.

2.2 The “Undesirable Scrambling” Problem

Although Ko’s (2005, 2006) explanation seems to cover the paradigm, it overlooks the properties of scrambling. Recall that her explanation crucially relies on the LF condition to distinguish the following two representations in (22).

(22)a. *[… Q … SBE … *wh* …]

b. ^{ok}[… Q … wh_i … SBE … t_i …]

Ko claims that the structure in (22b) is well-formed because the *wh*-phrase undergoes scrambling, not *wh*-movement. At this point, however, recall also that scrambling is subject to radical reconstruction at LF, as we have seen above. As a result of radical reconstruction, the representations in (22a) and (22b) become identical, so that both of them are ruled out by the Intervention Effect Constraint in (9), contrary to her claim.

One might say that radical reconstruction applies as long as it is necessary (e.g., Bošković and Takahashi 1998 and Sugisaki 2001), so the scrambled *wh*-phrase in (22b) need not be reconstructed. If this is the case, radical reconstruction ceases to be a problem. Ko’s analysis, however, faces more serious problem. Look at the schematic derivation in (23).

(23)a. Step 1; Scrambling of the *wh*-phrase and the SBE[9]

$[_{CIntP}\quad wh_i\quad SBE_j\quad$ ‘why’ $C_{Int}\ [_{IP}\ \ldots\ t_i\ \ldots\ t_j\ \ldots]]$

[9] The order of the SBE and the *wh*-phrase within IP is irrelevant here, because both of them are moved by scrambling.

b. Step 2; Merge of C_{Foc}, entering a checking relation with the *wh*-phrase
$[_{CFocP}\ C_{Foc}\ [_{CIntP}\ wh_i \quad \underline{SBE_j} \quad \underline{\text{'why'}} \quad C_{Int}\ [_{IP} \ldots\ t_i\ \ldots\ t_j\ \ldots]]]$

c. Step 3; Scrambling of the SBE to the C_{Foc}P-adjoined position
$[_{CFocP}\ \underline{SBE_j}\ C_{Foc}\ [_{CIntP} \quad wh_i \quad t'_j \quad \underline{\text{'why'}} \quad C_{Int}\ [_{IP} \ldots\ t_i\ \ldots\ t_j\ \ldots]]]$

Suppose that both the SBE and the *wh*-phrase are moved to the C_{Int}P-adjoined positions respectively, and the *wh*-phrase occupies the higher position, as shown in (23a). Then at the point where C_{Foc} is merged, nothing prevents the *wh*-phrase from entering a checking relation with C_{Foc}, as in (23b). Finally, at the Step 3 in (23c), the SBE is scrambled to the C_{Foc}P-adjoined position. If this scrambling is possible, the ungrammatical SBE-*wh*-'why' order can be wrongly derived. In fact, the example in (24) suggests that SBEs can be scrambled to this position, since it can undergo long-distance scrambling to the matrix clause. Given that a derivation proceeds phase-by-phase (Chomsky 2000, 2001), it is necessary to move the scrambled phrase through the highest edge of CP, namely Spec, C_{Foc}P.

(24) Taroo-ni-sika$_i$ Ziroo-ga [$_{CP}$ t'$_i$ Hanako-ga t$_i$ sono hon-o age-nakat-ta to] it-ta
-to-only -Nom -Nom that book-Acc give-not-Past C say-past
'Ziroo said that Hanako gave that book only to Taroo.'

We call this the "undesirable scrambling" problem, since the free application of scrambling obscures underlying checking relations.

The same problem arises in the case of the anti-superiority effect. Consider the following possible derivation in (25).

(25)a. Step 1; External merge of 'why' into Spec, C_{Int}P with feature checking
$[_{CIntP}\ \underline{\text{'why'}}\ C_{Int}\ [_{IP} \ldots\ wh\ \ldots]]$

b. Step 2; Scrambling of the *wh*-phrase to the C_{Int}P-adjoined position
$[_{CIntP}\ wh_i\ [_{CIntP}\ \underline{\text{'why'}}\ C_{Int}\ [_{IP} \ldots\ t_i\ \ldots]]]$

c. Step 3; Merge of the C_{Foc} head, with feature checking of the *wh*-phrase
$[_{CFocP}\ C_{Foc}\ [_{CIntP}\ wh_i\ [_{CIntP}\ \underline{\text{'why'}}\ C_{Int}\ [_{IP} \ldots\ t_i\ \ldots]]]]$

d. Step 4; Scrambling of 'why' to the C_{Foc}P-adjoined position
$[_{CFocP}\ \underline{\text{'why'}_j}\ C_{Foc}\ [_{CIntP}\ wh_i\ [_{CIntP}\ t_j\ C_{Int}\ [_{IP} \ldots\ t_i\ \ldots]]]]$

This derivation yields the 'why'-*wh* order. Note that the *wh*-phrase can enters the checking relation with C_{Foc} since 'why' does not intervene at the Step 3 in (25c), and nothing prevents

'why' being scrambled to the C_{Foc}P-adjoined position at the Step 4 in (25d) because the checking relation between 'why' and C_{Int} has been already established. Thus, the ungrammatical 'why'-*wh* order is wrongly predicted to be grammatical.

In addition to the undesirable scrambling problem, there is an independent motivation to cast doubt on Ko's (2005, 2006) analysis. Recall that her argument is based on the assumption that 'why' is subject to the Intervention Effect Constraint. Evidence for this assumption is (10b), repeated here as (26a).

(26)a. *Hanako-sika [$_{CP}$ Taroo-ga naze kur-u to] iwa-nakat-ta no?
-only -Nom why come-Pres C say-not-Past Q

'What is the reason x such that Hanako said that Taroo is coming for x?'

b. *Hanako-ga [$_{CP}$ Taroo-ga naze kur-u to] iwa-nakat-ta no?
-Nom -Nom why come-Pres C say-not-Past Q

'What is the reason x such that Hanako didn't say that Taroo is coming for x?'

c. *Why$_i$ don't you think [t_i [we can help him]]? (Rizzi 1990, p. 83)

The example in (26b), however, suggests that the example in (26a) is ruled out by other reasons, independently of the Intervention Effect Constraint. The example in (26b) minimally differs from (26a) in that the SBE subject in (26a) is replaced to the non-SBE one. The example in (26b) is ungrammatical because 'why' crosses the negative island (Rizzi 1990). A typical case of the negative island is shown in (26c). That is, the *wh*-movement of 'why' to the matrix clause is blocked by negation, which is situated between 'why' and the matrix interrogative C. Note that (26a) also has negation between 'why' and the matrix interrogative C. Therefore, we claim that (26a) is ungrammatical because it violates negative island on par with (26b), not because feature checking of 'why' is blocked by the SBE. Thus, there is no reason to believe that 'why' is subject to the Intervention Effect Constraint.

Summarizing this section, we reviewed the analysis by Ko (2005, 2006) and pointed out the problems it faces. In particular, we argued that since the analysis has no way to forbid scrambling to the highest CP-adjoined position, it cannot avoid the undesirable scrambling problem. We also argued that the assumption that 'why' also obeys the Intervention Effect Constraint is not founded.

3. Proposals and Analysis

This section provides an alternative theory which can explain the paradigm in (7), overcoming the problems of the previous studies. First, Section 3.1 recaptures what we have to explain. Then, in Section 3.2, we propose a theory which crucially employs Pesetsky and Torrego's (2004) conception of feature interpretability and feature valuation, and illustrate how the proposed mechanism explain the paradigm. Finally, in Section 3.3, we show that a

residual problem can be solved if Nissenbaum's (2000) distinction of overt/covert movement is adopted, coupled with Richards' (2001) tucking-in theory, arguing that this in turn supports Nissenbaum's theory.

3.1 Recapturing What We Have to Explain

3.1.1 To Capture the Generalization on the Word Order

One of the things which we have to explain is the generalization on the word order among the SBEs, *wh*-phrases, and 'why'. In what way is the word order restricted? Look at the configurations in (27), to which the whole paradigm in (7) is integrated.

(27)a. *[… Q … SBE/'why' … *wh* …] vs. ^{ok}[… Q … *wh* … SBE/'why' …]

b. ^{ok}[… Q … SBE … 'why' …] vs. ^{ok}[… Q … 'why' … SBE]

Only the order where the SBE or 'why' intervenes between Q and *wh*-phrases is ungrammatical. Thus, we have the following preliminary generalization in (28).

(28)*Generalization on the Word Order (preliminary)*
SBE/'why' cannot intervene between Q and *wh*-phrases, while there is no order restriction between SBEs and 'why'.

Here, two questions arise.

(29)a. What is the difference between the ordinary *wh*-phrases and 'why'?

b. What is the similarity between SBEs and 'why'?

Note that the questions in (29) are closely related to the questions in (8b) and (8c). Thus, if we can answer the questions in (29), it provides a key to answer to (8b) and (8c).

We start with the first question in (29a). Our answer is the following; the ordinary *wh*-phrases have the focus feature, while 'why' lacks it. In general, *wh*-phrases bear focus. As shown in (30a), *wh*-phrases are incompatible with focused items in Italian.

(30)a. *A chi QUESTO hanno ditto (non qualcos'altro)?[10] (Rizzi 1999, p. 4)

'To whom THIS they said (not something else)?'

b. Perchè QUESTO avremmo dovuto dirgli, non qualcos'altro? (*ibid*, p. 7)

'Why THIS we should have said to him, not something else?'

Rizzi (1999) explains this fact by claiming that the *wh*-phrases and the focused items compete for the only one focus position, namely Spec, $C_{Foc}P$, to check their focus feature. On the other

[10] The focused items are indicated in capitals.

hand, as shown in (30b), *perchè* 'why' can co-occur with the focused elements. If 'why' lacks the focus feature, as we claim, their co-occurrence is not surprising because they do not compete for Spec, $C_{Foc}P$.

Another difference between the ordinary *wh*-phrases and 'why' is found in the bare-binary combination construction, exemplified in (31).

(31)a. *When Adam?/*What at school?

b. Why Adam?/Why at school?

Among the *wh*-phrases, only 'why' can appear in this construction. Kawamura (2006a, b) claims that the non-*wh* part of the construction, namely *Adam* or *at school*, bears focus. If this is correct, the contrast in (31) can be explained essentially in the same way as the explanation of (30) above. That is, given a sentence cannot have double foci, only the examples in (31b) are grammatical since 'why' lacks the focus feature.

Finally, another instance of the focus association of 'why' can be found in (32). Bromberger (1992) observes that focus-shift affects the range of possible answers to *why*-questions, as shown in (32).

(32)a. Why did ADAM eat the apple?
---Because he was the one that Eve worked on.

b. Why did Adam EAT the apple?
---Because he couldn't think of anything else to do with it.

c. Why did Adam eat the APPLE?
---Because it was the only food around.

The examples in (32) indicate that the felicitous answers to the *why*-question change depending on which constituent is focused. This can be explained if it is assumed that 'why' lacks the focus feature, so that it can be associated with focus. On the other hand, the range of the answers to the ordinary *wh*-questions is not affected by focus-shift, as illustrated in (33).

(33)a. When did ADAM eat the apple?
---At 4_{PM} on July 7, $24{,}000_{BC}$.

b. When did Adam EAT the apple?
--- At 4_{PM} on July 7, $24{,}000_{BC}$.

c. When did Adam eat the APPLE?
--- At 4_{PM} on July 7, $24{,}000_{BC}$.

This fact can be explained if we assume that the ordinary *wh*-phrases are inherently focused, so that it cannot be associated with focus. Thus, we conclude that *wh*-phrases in general have the focus feature, while 'why' lacks it.

Then, let's turn to the nature of SBEs. Based on Kim's (2002) claim that the source of the intervention effect is the focus-relatedness of SBEs, we assume that SBEs have the focus feature, which is checked by its counterpart on C (see also Aoyagi 1994 for the similar proposal).

Now, we have briefly specified what lexical items have what features. They are summarized in (34).

(34)*Feature Specifications of Lexical Items (preliminary)*

	Q-feature	Focus-feature
a. SBEs	----	√
b. *wh*-phrases	√	√
c. 'why'	√	----
d. interrogative C	√	optional

Here, we got the answers to the questions in (29). Compare the feature specifications of the *wh*-phrases and 'why'. The answer to (29a) is that *wh*-phrases and 'why' differ in the absence of the focus feature. Next, compare SBEs, *wh*-phrases, and 'why'. The answer to the question in (29b) is the following; SBEs and 'why' are similar in that the feature which they have constitutes the proper subset of the features which the ordinary *wh*-phrases have.

So, let us reconsider the configurations under the feature specifications in (34). They are summarized in (35).

(35)a. ^{ok}[… C{Q, Foc} … *wh*{Q, Foc} … SBE{Foc}/ 'why'{Q} …]

b. *[… C{Q, Foc} … SBE{Foc}/ 'why'{Q} … *wh*{Q, Foc} …]

c. ^{ok}[… C{Q, Foc} … SBE{Foc} … 'why'{Q} …]

d. ^{ok}[… C{Q, Foc} … 'why'{Q} … SBE{Foc} …]

At this point, we can revise the preliminary generalization in (28) to (36).

(36)*Generalization on the Word Order (revised)*

α can enter the checking relation with a head H iff there is no intervening β which contains the proper subset of the features relevant to the checking relation.

This generalization can correctly distinguish the ill-formed (35b) from the other well-formed configurations. In Section 3.2.2, we will derive this generalization.

Before continuing, it is worth pointing out that a split-CP system, in which each C hosts the Q-feature and the focus feature separately, is incompatible with the generalization (36). Consider the configuration in (37a), where an SBE precedes a *wh*-phrase. Note that this ordering should be ruled out. The derivation proceeds as illustrated in (37b).

(37)a. $[_{CP2}\ C_2\{Q\}\ [_{CP1}\ C_1\{Foc\}\ [_{IP}\ \ldots\ \ SBE\{Foc\}\ \ \ldots\ \ \textit{wh}\{Q, Foc\}\ \ \ldots]]]$

b. Step 1; The SBE enters checking relation with C_1[11]
$[_{CP2}\ C_2\{Q\}\ [_{CP1}\ C_1\{\sout{Foc}\}\ [_{IP}\ \ldots\ \ SBE\{Foc\}\ \ \ldots\ \ \textit{wh}\{Q, Foc\}\ \ \ldots]]]$

Step 2; The *wh*-phrase enters a checking relation with C_2
$[_{CP2}\ C_2\{\sout{Q}\}\ [_{CP1}\ C_1\{\sout{Foc}\}\ [_{IP}\ \ldots\ \ SBE\{Foc\}\ \ \ldots\ \ \textit{wh}\{Q, Foc\}\ \ \ldots]]]$

Under the generalization (36), the Step 2 in (37b) counts as legitimate, because the feature relevant to this checking relation is only the Q-feature, and the SBE does not have it. Therefore, the derivation converges, yielding the SBE-*wh* order, contrary to fact. Thus, in what follows, we will adopt the single-CP system.

3.1.2 To Find a Solution to the "Undesirable Scrambling" Problem

Another important issue is to solve the undesirable scrambling problem, which casts serious doubt on Ko's (2005, 2006) analysis. In fact, this problem arises even under the single-CP system. Look at the derivation in (38).

(38)a. Step 1; Merge of C
$[_{CP}\ C\{Q, Foc\}\ [_{IP}\ \ldots\ \ \textit{wh}\{Q, Foc\}\ \ \ldots\ \ SBE\{Foc\}\ \ \ldots]]$

b. Step 2; The *wh*-phrase enters a checking relation with C, observing (36)
$[_{CP}\ C\{\sout{Q}, \sout{Foc}\}\ [_{IP}\ \ldots\ \ \textit{wh}\{\sout{Q}, \sout{Foc}\}\ \ \ldots\ \ SBE\{Foc\}\ \ \ldots]]$

c. Step 3; The SBE is scrambled to the highest CP-adjoined position
$[_{CP}\ SBE\{Foc\}\ [_{CP}\ C\{\sout{Q}, \sout{Foc}\}\ [_{IP}\ \ldots\ \ \textit{wh}\{\sout{Q}, \sout{Foc}\}\ \ \ldots\ \ t_{SBE}\ \ \ldots]]$

In (38a), the *wh*-phrase precedes the SBE. This configuration is well-formed on par with (35a) so that the checking relation between the *wh*-phrase and the C head can observe the generalization (36), as indicated in (38b). In principle, once the checking relation is established, the SBE can be scrambled to the CP-adjoined position as in (38c). The derivation can converge, yielding the ungrammatical SBE-*wh* order. As shown in (38), undesirable

[11] A strike-through indicates that the feature is deleted by feature checking.

scrambling is problematic because it obscures underlying checking relations. It is necessary to forbid the undesirable scrambling, without recourse to ad hoc assumptions.

In this subsection, we have argued that there are two things that have to be solved to give a uniform explanation to the paradigm in (27); the generalization on word order (36) and the undesirable scrambling problem. As a first step to solve the problem, we have suggested that specification of features on lexical items and the way of feature checking play a crucial role to solve the problems. In Section 3.2, we further pursue this line of approach and implement it in more specific way.

3.2 Implementation

3.2.1 More Precise Feature Specifications of Lexical Items

First, we revise the feature specifications of lexical items in (27), adopting the proposal by Pesetsky and Torrego (2004). Their basic idea is that valuation of a feature is independent of interpretability of it; whether a feature is interpretable or not is irrelevant to whether it has value or not. Thus, there are four logically possible repertoires of features, listed in (39).

(39)*Repertoire of Possible Features*

	notation	Examples
a. interpretable, valued	$[_{iX}$ X]	$[_{iQ}$ Q] on yes/no question C
b. interpretable, unvalued	$[_{iX}$]	$[_{iQ}$] on *wh*-question C
c. uninterpretable, valued	$[_{uX}$ X]	$[_{uQ}$ Q] on *wh*-phrases
d. uninterpretable, unvalued	$[_{uX}$]	$[_{uQ}$] on embedded declarative C which supports successive cyclic *wh*-movement

The first one, in (39a), is interpretable valued feature $[_{iX}$ X]. One instance of this feature is $[_{iQ}$ Q], which appears on yes/no-question C. The second possibility is the interpretable unvalued feature $[_{iX}$]. *Wh*-question C has one instance of this type, namely $[_{iQ}$], which attracts a *wh*-phrase and gets valued from it. The third type is the uninterpretable valued feature $[_{uX}$ X], which for example appears on *wh*-phrases as $[_{uQ}$ Q]. The last type is the uninterpretable unvalued feature $[_{uX}$]. A concrete example of this type is $[_{uQ}$], which appears on the embedded declarative C, which supports successive cyclic *wh*-movement.

One important aspect of Pesetsky and Torrego's (2004) theory is that a feature which is unvalued can act as probe, even though the feature is interpretable. Consider how their theory derives a *wh*-question in (40a). We omit the focus features here.

(40)a. [$_{CP2}$ What$_i$ do you think [$_{CP1}$ t'$_i$ John bought t$_i$]]?

b. Step 1; [$_{uQ}$] on the embedded C_1 probes its domain, and it finds *what* as a goal[12] [13]

[$_{CP1}$ C_1{[$_{uQ}$ **Q**]} [$_{IP}$ … what{[$_{uQ}$ Q]} …]]

Step 2; C_1 attracts *what* to Spec, CP_1

[$_{CP1}$ what{[$_{uQ}$ Q] }$_i$ C_1{~~[$_{uQ}$ **Q**]~~} [$_{IP}$ … t$_i$ …]]

Step 3; [$_{iQ}$] on the matrix C_2 probes its domain, and it finds *what* as a goal

[$_{CP2}$ C_2{[$_{iQ}$ **Q**]} [$_{IP}$ … [$_{CP1}$ what{~~[$_{uQ}$ Q]~~}$_i$ C_1 [$_{IP}$ … t$_i$ …]]]]

Step 4; C_2 attracts *what* to Spec, CP_2

[$_{CP2}$ what{~~[$_{uQ}$ Q]~~}$_i$ C_2{[$_{iQ}$ **Q**]} [$_{IP}$ … [$_{CP1}$ t'$_i$ C_1 [$_{IP}$ … t$_i$ …]]]]

At the Step 1 in the derivation (40b), [$_{uQ}$] on the embedded C probes its domain and finds the *wh*-phrase *what* as goal. Then, attracting the *wh*-phrase to its Spec, the embedded C gets valued from it, so that [$_{uQ}$] is deleted. Given that an uninterpretable valued feature can be deleted iff it is checked by interpretable features, [$_{uQ}$ Q] on the *wh*-phrase is not deleted. Then, the matrix C is introduced to the derivation as in the Step 2 in (40b), and [$_{iQ}$] on it probes its domain and find *what* on the embedded Spec, CP as goal.[14] It values [$_{iQ}$] on the matrix C and by assumption, it can be deleted. In this way, Pesetsky and Torrego's (2004) theory makes it possible to derive successive cyclic *wh*-movement, postulating only one kind of feature, namely Q-feature.

Under Pesetsky and Torrego's (2004) typology of features, we have to sharpen the feature specification of the focus feature. Given that focus is a kind of clausal phenomena, it is natural to assume that if a focus feature appears on C, it becomes interpretable, while if it appears on an SBE, which is a subpart of a clause, it becomes uninterpretable. Thus, we claim that SBEs have [$_{uF(oc)}$ F], and C can optionally have [$_{iF}$].

Now, we have more precise feature specifications of lexical items, as listed in (41).

[12] The value which is assigned via feature valuation is indicated by boldface.

[13] Probing by unvalued features is indicated by dotted lines.

[14] Here, we put aside the *v**P phase for ease of exposition. It is possible to obtain the same result if we assume that *v** has [$_{uQ}$].

(41)*Feature Specifications of Lexical Items (revised)*

	Q-feature	Focus-feature
a. SBEs	----	$[_{uF}$ F]
b. *wh*-phrases	$[_{uQ}$ Q]	$[_{uF}$ F]
c. 'why'	$[_{uQ}$ Q]	----
d. yes/no-question C	$[_{iQ}$ Q]	optionally, $[_{iF}$]
e. *wh*-question C	$[_{iQ}$]	optionally, $[_{iF}$]
f. embedded declarative C	$[_{uQ}$]	optionally, $[_{iF}$]

Note that features on SBEs, *wh*-phrases, and 'why' are all uninterpretable although they are valued. Thus, the only way for them to be deleted is to be probed by interpretable unvalued features, namely the features on C. On the other hand, under Chomsky's (2000, 2001) conception of interpretability and valuation, interpretable features always have value, so that they need not be checked. Therefore, since the focus feature on SBEs, for example, is presumably valued, it must be interpretable. This difference between Pesetsky and Torrego (2004) and Chomsky (2000, 2001) becomes crucial when we solve the undesirable scrambling problem. We will come back to this point later.

3.2.2 Analysis

Let us turn to the word order generalization in (39). To derive the generalization, we propose the Valuation Condition (42).

(42)*Valuation Condition*

A probe P must utilize all valued features on a goal G for valuation of unvalued features on P.

Let us examine how the Valuation Condition, combined with the feature specifications in (41) works. The schematic structure of the intervention/anti-superiority effect is shown in (43).

(43)a. *[… Q … SBE/'why' … *wh* …]

b. ^{ok}[… Q … *wh* … SBE/'why' …]

Below, we concentrate on the case of the intervention effect for ease of exposition. The anti-superiority effect can be explained essentially in the same way.

Given that the relevant features are not enter any checking relation within IP so that scrambling freely change the order of *wh*-phrases and SBEs, we have two logically possible configurations at the point where the matrix interrogative C is merged, as indicated in (44).

(44)a. Possibility 1; An SBE precedes a *wh*-phrase

$[_{CP}$ C{$[_{iQ}$], $[_{iF}$]} $[_{IP}$ … SBE{$[_{uF}$ F]} … *wh*{$[_{uQ}$ Q], $[_{uF}$ F]} …]]

b. Possibility 2; A *wh*-phrase precedes an SBE
$[_{CP}\ C\{[_{iQ}\ \ ],\ [_{iF}\ \ ]\}\ [_{IP}\ \ldots\ \ \textit{wh}\{[_{uQ}\ Q],\ [_{uF}\ F]\}\ \ \ldots\ \ SBE\{[_{uF}\ F]\}\ \ \ldots]]$

First, let us consider the Possibility 1 in (44a). The derivation proceeds as in (45).

(45)*Continuation of the Possibility 1*

a. Step 1; C probes its domain, and it finds the SBE as a goal[15]
$[_{CP}\ C\{[_{iQ}\ \ ],\ [_{iF}\ \mathbf{F}]\}\ [_{IP}\ \ldots\ \ SBE\{\sout{[_{uF}\ F]}\}\ \ \ldots\ \ \textit{wh}\{[_{uQ}\ Q],\ [_{uF}\ F]\}\ \ \ldots]]$

b. Step 2; C probes its domain again, and it finds the *wh*-phrase as a goal[16]
$[_{CP}\ C\{[_{iQ}\ \ ],\ [_{iF}\ \mathbf{F}]\}\ [_{IP}\ \ldots\ \ SBE\{\sout{[_{uF}\ F]}\}\ \ \ldots\ \ \textit{wh}\{[_{uQ}\ Q],\ [_{uF}\ F]\}\ \ \ldots]]$
X

As shown in (45a), C probes its domain, and finds the SBE as a goal, since the SBE asymmetrically c-commands the *wh*-phrase at this step. Then, $[_{iF}\ \ ]$ on C is valued by $[_{uF}\ F]$ on the SBE. Since C utilizes all features on the SBE, this step is legitimate. Then, C probes its domain again as in (45b), and finds the *wh*-phrase as a goal. The probe, however, cannot utilize $[_{uF}\ F]$ on the *wh*-phrase because $[_{iF}\ \ ]$ on C has been already valued at the Step 1. Therefore, this step violates the Valuation Condition. As a result, the ungrammatical SBE-*wh* order is correctly ruled out.

Let us now turn to the Possibility 2 in (44b). Look at the derivation in (46).

(46)*Continuation of the Possibility 2*

a. Step 1; C probes its domain, and it finds the *wh*-phrase as a goal
$[_{CP}\ C\{[_{iQ}\ \mathbf{Q}],\ [_{iF}\ \mathbf{F}]\}\ [_{IP}\ \ldots\ \ \textit{wh}\{\sout{[_{uQ}\ Q]},\ \sout{[_{uF}\ F]}\}\ \ \ldots\ \ SBE\{[_{uF}\ F]\}\ \ \ldots]]$

b. Step 2; The fully valued C check the uninterpretable feature on the SBE
$[_{CP}\ C\{[_{iQ}\ \mathbf{Q}],\ [_{iF}\ \mathbf{F}]\}\ [_{IP}\ \ldots\ \ \textit{wh}\{\sout{[_{uQ}\ Q]},\ \sout{[_{uF}\ F]}\}\ \ \ldots\ \ SBE\{\sout{[_{uF}\ F]}\}\ \ \ldots]]$

C probes its domain and finds the *wh*-phrase as a goal, as illustrated in (46a). By the Valuation Condition, C has to exhaust the features on the *wh*-phrase, namely $[_{uQ}\ Q]$ and $[_{uF}\ F]$, so that all the unvalued features on C are valued. Then, the fully valued C can check $[_{uF}\ F]$ on the SBE as in (46b). This step observes the Valuation Condition since no feature valuation takes place. Therefore, the Possibility 2 converges, yielding the grammatical *wh*-SBE order.

[15] In this subsection, we deal with the special case where all operations are covert. Next subsection argues the interaction of overt and covert operations, although it does not affect the argument here.

[16] A pair of features that is problematic for the relevant operation is indicated by screening.

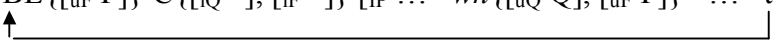
Note that the explanation here crucially relies on the assumption that it is impossible to change the IP-internal order of elements, which enter the checking relation with C. Therefore, we have to ensure that the order of the relevant elements is preserved after feature checking. To do so, we have to solve the undesirable scrambling problem. Here, we provide a solution to the problem. Suppose that α contains an undeleted uninterpretable feature [$_{uX}$ X], and it is scrambled to the matrix CP-adjoined position, before C probes its domain. The structure in (47) is the relevant one.

(47) *[$_{CP}$ α{[$_{uX}$ X]} C_{matrix}{[$_{iX}$]} [$_{IP}$ … t_{α} …]]

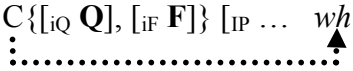
Given that scrambling does not involve any feature checking, and the search domain of a probe is restricted to the sister of the head, there is no way to check the undeleted [$_{uX}$ X] on α. Therefore, such scrambling, namely "scrambling before feature checking", always induces ungrammatical result. Recall that SBEs, *wh*-phrases, and 'why' have uninterpretable features under Pesetsky and Torrego's (2004) theory. Thus, scrambling of them before feature checking makes the derivation crash.

The derivation in (48) is one concrete example. In (48a), the SBE, which had followed the *wh*-phrase within IP, is scrambled to the CP-adjoined position before C probes its domain.

(48)a. Step 1; SBE is scrambled before C probes its domain
[$_{CP}$ SBE{[$_{uF}$ F]} C{[$_{iQ}$], [$_{iF}$]} [$_{IP}$ … *wh*{[$_{uQ}$ Q], [$_{uF}$ F]} … t_{SBE} …]]



b. Step 2; C probes its domain, and it finds *wh*-phrase as a goal
[$_{CP}$ SBE{[$_{uF}$ F]} C{[$_{iQ}$ **Q**], [$_{iF}$ **F**]} [$_{IP}$ … *wh*{~~[$_{uQ}$ Q]~~, ~~[$_{uF}$ F]~~} … t_{SBE} …]]



Then, C probes its domain and finds the *wh*-phrase as a goal. Therefore, the features on the *wh*-phrase and C are successfully valued and deleted, observing the Valuation Condition. However, the scrambled SBE still has the uninterpretable feature [$_{uF}$ F], and there is no way to check it. Hence, the derivation crashes and the ungrammatical SBE-*wh* order is ruled out. That is, it is scrambling of the SBE that makes the derivation crash. Note that under Chomsky's (2000, 2001) idea of feature interpretability and valuation, this situation is unexpected. As we have seen above, SBEs are arguably valued so that interpretable. Therefore, there is no reason for the derivation in (48) to crash, contrary to fact. Thus, the undesirable scrambling problem does offer an empirical argument for Pesetsky and Torrego's (2004) conception of valuation/interpretability of features.

How does the proposed analysis deal with the absence of the intervention effect, repeated here in (49)?

(49)a. ^{ok}[… Q … SBE … 'why' …]

b. ^{ok}[… Q … ‘why’ … SBE]

At the point where the matrix interrogative C is introduced to the derivation, we have two logically possible configurations (50a) and (50b), because the features on the SBE and ‘why’ are not checked within IP, so that scrambling freely alter the ordering.

(50)a. Possibility 1; An SBE precedes ‘why’
[$_{CP}$ C{[$_{iQ}$], [$_{iF}$]} [$_{IP}$ … SBE{[$_{uF}$ F]} … ‘why’{[$_{uQ}$ Q]} …]]

b. Possibility 2; ‘Why’ precedes an SBE
[$_{CP}$ C{[$_{iQ}$], [$_{iF}$]} [$_{IP}$ … ‘why’{[$_{uQ}$ Q]} … SBE{[$_{uF}$ F]} …]]

Let us continue the derivation of the Possibility 1. Look at (51).

(51)*Continuation of the Possibility 1*

a. Step 1; C probes its domain, and it finds the SBE as a goal
[$_{CP}$ C{[$_{iQ}$], [$_{iF}$ **F**]} [$_{IP}$ … SBE{~~[$_{uF}$ F]~~} … ‘why’{[$_{uQ}$ Q]} …]]

b. Step 2; C probes its domain again, and it finds ‘why’ as a goal
[$_{CP}$ C{[$_{iQ}$ **Q**], [$_{iF}$ **F**]} [$_{IP}$ … SBE{~~[$_{uF}$ F]~~} … ‘why’{~~[$_{uQ}$ Q]~~} …]]

In this case, each step in (51) obeys the Valuation Condition, since each step utilizes the all valued features on the goal, namely [$_{uF}$ F] on the SBE and [$_{uQ}$ Q] on ‘why’, respectively. Thus, the derivation can converge, yielding the grammatical SBE-‘why’ order. The Possibility 2 in (50b) gets the same way. Look at the derivation in (52).

(52)*Continuation of the Possibility 2*

a. Step 1; C probes its domain, and it finds ‘why’ as a goal
[$_{CP}$ C{[$_{iQ}$ **Q**], [$_{iF}$]} [$_{IP}$ … ‘why’{~~[$_{uQ}$ Q]~~} … SBE{[$_{uF}$ F]} …]]

b. Step 2; C probes its domain again, and it finds the SBE as a goal
[$_{CP}$ C{[$_{iQ}$ **Q**], [$_{iF}$ **F**]} [$_{IP}$ … ‘why’{~~[$_{uQ}$ Q]~~} … SBE{~~[$_{uF}$ F]~~} …]]

In this case, the value of [$_{iQ}$] is valued first, because ‘why’ is closer to C than the SBE. Each step can observe the Valuation Condition, so that the grammatical ‘why’-SBE order can be derived.

To sum up this section, we argued that the feature specifications in (41) and the Valuation Condition (42) can derive the effects of the generalization (36). We also argued that Pesetsky and Torrego’s (2004) idea makes it possible for SBEs, *wh*-phrases, and ‘why’ to have uninterpretable features, which in turn enables us to solve the undesirable scrambling

problem; scrambling before feature checking is impossible. The next subsection, however, shows that the proposed analysis does not fully solve the problem yet; it cannot exclude the possibility of "scrambling after feature checking". We claim that this residual problem can be solved by assuming the proposals by Nissenbaum (2000) and Richards (2001), and argue that this in turn provide a support for their proposals.

3.3 Solving the Residual Problem

To understand the problem of scrambling after feature checking, consider the derivation in (53).

(53)a. Step 1; Merge of C to IP, where the *wh*-phrase precedes the SBE
$[_{CP}\ C\{[_{iQ}\ \ ],\ [_{iF}\ \ ]\}\ [_{IP}\ \ldots\ \ \textit{wh}\{[_{uQ}\ Q],\ [_{uF}\ F]\}\ \ \ldots\ \ SBE\{[_{uF}\ F]\}\ \ \ldots]]$

b. Step 2; C probes its domain, and it finds the *wh*-phrase as a goal
$[_{CP}\ C\{[_{iQ}\ \mathbf{Q}],\ [_{iF}\ \mathbf{F}]\}\ [_{IP}\ \ldots\ \ \textit{wh}\{[_{uQ}\ \cancel{Q}],\ [_{uF}\ \cancel{F}]\}\ \ \ldots\ \ SBE\{[_{uF}\ F]\}\ \ \ldots]]$

c. Step3; The fully valued C checks the uninterpretable feature on the SBE
$[_{CP}\ C\{[_{iQ}\ \mathbf{Q}],\ [_{iF}\ \mathbf{F}]\}\ [_{IP}\ \ldots\ \ \textit{wh}\{[_{uQ}\ \cancel{Q}],\ [_{uF}\ \cancel{F}]\}\ \ \ldots\ \ SBE\{[_{uF}\ \cancel{F}]\}\ \ \ldots]]$

d. Step 4; Scrambling of the SBE to the CP-adjoined position
$[_{CP}\ SBE\{[_{uF}\ \cancel{F}]\}\ C\{[_{iQ}\ \mathbf{Q}],\ [_{iF}\ \mathbf{F}]\}\ [_{IP}\ \ldots\ \ \textit{wh}\{[_{uQ}\ \cancel{Q}],\ [_{uF}\ \cancel{F}]\}\ \ \ldots\ \ t_{SBE}\ \ \ldots]]$

As we have seen in the previous subsection, each step in (53b) and in (53c) is possible. The problematic step is the Step 4 in (53d). If this step is in fact possible, the ungrammatical SBE-*wh* order cannot be ruled out, because all the features have already cease to be problematic until that point. Recall that the undesirable scrambling problem is a problem of scrambling before feature checking. What happens here is the scrambling of the SBE after its feature-checking. Let us call this the "revived undesirable problem". In the rest of this section, we argue that this problem can be solved once we assume the theory by Nissenbaum (2000), who claims that all overt operations must precede the covert ones within a certain domain.

The central idea of Nissenbaum (2000) is that the overt component and the covert component succeed each other. To embody this idea, Nissenbaum (2000) first assumes (54) and (55) (Nissenbaum 2000, p. 17).

(54) *Pronunciation of Chains*
A syntactic chain is spelled out in exactly one position --- the highest one possible.

(55) Spellout *Applies to the Internal Domain on Each Cycle*
The *spellout* property of a head H is satisfied by applying rules of phonology to the sister of H.

Then, Nissenbaum (2000) distinguishes overt and covert operations in the following way (Nissenbaum 2000, p. 13).

(56)*The Difference between Overt and Covert Movement is Due to Sequencing*
Operations that precede spellout are overt, while those that follow it are covert.

Under this distinction, if movement applies first, and then the internal domain of H is spelled out, the moved phrase α is pronounced at the landing site, by the assumption in (54). This situation is illustrated in (57).

(57)a. Step 1; Movement of α
$[_{HP} \ldots \ \alpha \ \ldots H [\ldots \ \alpha \ \ldots]]$

b. Step 2; Spellout of the internal domain[17]
$[_{HP} \ldots \ \alpha \ \ldots H [\![\ldots \ <\alpha> \ \ldots]\!]]$

This is the case of overt movement. On the other hand, if the internal domain of H is spelled out first, the position where α is pronounced is determined at this point. Thus, the subsequence movement cannot be overt, as indicated in (58).

(58)a. Step 1; Spellout of the internal domain
$[_{HP} H [\![\ldots \ \alpha \ \ldots]\!]]$

b. Step 2; Movement of α
$[_{HP} \ldots \ <\alpha> \ \ldots H [\![\ldots \ \alpha \ \ldots]\!]]$

This yields covert movement. In this way, Nissenbaum's (2000) theory ensures that within a certain domain, namely where the head H drives operations, all overt operations apply before the covert ones do.

Now, we can dissolve the revived undesirable scrambling problem. Look at the derivation in (59).

[17] A spelled out domain is indicated by ⟦ … α … ⟧ notation, and <α> indicates that α is not pronounced there.

(59)a. Step 1; Both α and β undergo covert movement[18]

$[_{HP}\ H\{[_{iX}\ \mathbf{X}], [_{iY}\ \mathbf{Y}]\}\ [_{H'P}\ \ldots\ \ \alpha\{[_{u\mathrm{X}}\ \mathrm{X}]\}\ \ \ldots\ \ \beta\{[_{u\mathrm{Y}}\ \mathrm{Y}]\}\ \ \ldots]]$

b. Step 2; Scrambling of β

$[_{HP}\ \beta\{[_{u\mathrm{Y}}\ \mathrm{Y}]\}\ H\{[_{iX}\ \mathbf{X}], [_{iY}\ \mathbf{Y}]\}\ [_{H'P}\ \ldots\ \ \alpha\{[_{u\mathrm{X}}\ \mathrm{X}]\}\ \ \ldots\ \ t_{\beta}\ \ \ldots]]$

Suppose that both α and β undergo covert movement and the unvalued features on H get valued, as in (59a). This means that the internal domain of H, namely H'P has been already spelled out at this point. Since by definition, scrambling is an overt operation, it is impossible to apply it to the configuration in (59a). Therefore, the step in (59b), which is the "revived undesirable" step, is impossible. This is the solution.

In addition to providing a solution to the revived undesirable scrambling problem, Nissenbaum's (2000) theory has another good point. So far, we have dealt with the cases in which all operations take place covertly. As we have seen above, what is crucial to our explanation is to ensure that the ordering of elements which enter the checking relation with C is not destroyed by feature checking itself. Interaction of overt and covert operations may make it impossible to guarantee the word order preservation. Nissenbaum's (2000) mechanism coupled with Richards' (2001) tucking-in, however, makes it possible to extend the analysis to the cases where overt and covert operations interact.

Before continuing, let us clarify when spellout applies in Japanese. We claim that spellout applies at any point during the head H is executing operations.[19] In other words, Japanese/Korean has both overt and covert movement options. Evidence for this claim comes from the radical reconstruction example (3b), repeated here as in (60).

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[18] Under Nissenbaum's (2000) theory of movement, the more precise representation of (59a) should be the following;

(i) $[_{HP}\ <\alpha\{[_{u\mathrm{X}}\ \mathrm{X}]\}> <\beta\{[_{u\mathrm{Y}}\ \mathrm{Y}]\}> H\{[_{iX}\ \mathbf{X}], [_{iY}\ \mathbf{Y}]\}\ [_{H'P}\ \ldots\ \ \alpha\{[_{u\mathrm{X}}\ \mathrm{X}]\}\ \ \ldots\ \ \beta\{[_{u\mathrm{Y}}\ \mathrm{Y}]\}\ \ \ldots]]$

In the following discussion, however, we continue to use the conventional structure as if no movement takes place in cases of covert movement, for expository purpose.

[19] Richards (2001) offers the following parameters of the interrogative C.

(i) a. English *wh*-movement: Apply spellout after exactly one wh-phrase raises to the periphery of an interrogative clause. (Richards 2001, p. 203)

b. Chinese: Don't apply spellout after any *wh*-phrase has raised to the periphery of an interrogative clause. (*ibid*., p. 207)

c. Bulgarian: Don't attract any *wh*-phrase to the periphery of an interrogative clause after spellout has applied. (*ibid*., p. 207)

(60) ?[$_{TP}$ Nani$_i$-o Taroo-ga [$_{CP}$ t'$_i$ [$_{TP}$ Hanako-ga t_i kat-ta] ka] siritagatteir-u]
what-Acc -Nom -Nom buy-Past Q want-to-know-Pres

'Taroo wants to know what Hanako bought.'

In this example, the *wh*-phrase *nani* 'what' undergoes long-distance scrambling to the matrix clause, taking its scope at the embedded CP. Given that long-distance scrambling must move through the edge of the embedded CP (see Saito 2003, 2005), *nani* 'what' has to stop at the edge, establishing a checking relation with the embedded C to take the embedded scope. Under our current assumptions, however, it is impossible to establish the relation by scrambling to the CP-adjoined position, because scrambling does not involve any feature checking. Meanwhile, if only the covert option is available to check [$_{uQ}$ Q] on *nani* 'what', it is impossible to move the *wh*-phrase to the edge of the embedded CP, because scrambling is no longer available after the covert feature checking. Hence, there is no way to scramble the *wh*-phrase to the matrix CP. Therefore, it is necessary to assume the overt movement option, in addition to the covert one. If this is the case, it in turn implies spellout can apply at any point during the relevant head is active.

Bearing this mind, let us see how the order of elements is preserved. Consider the configuration in (61), where the internal domain H'P contains two elements which must be checked by H.

(61) [$_{HP}$ H{[$_{iX}$], [$_{iY}$]} [$_{H'P}$ … α{[$_{uX}$ X]} … β{[$_{uY}$ Y]} …]]

Since there are two elements α and β, and two movement options, we have four logically possible combinations. The first possibility is that both of them undergo covert movement, as in (62). Of course, the order cannot be changed.

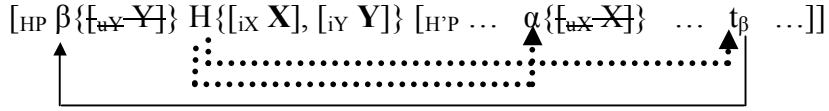
(62)*Order Preservation Case 1; both α and β undergo covert movement*
[$_{HP}$ H{[$_{iX}$ **X**], [$_{iY}$ **Y**]} [$_{H'P}$ … α{[$_{uX}$ ~~X~~]} … β{[$_{uY}$ ~~Y~~]} …]]

The second one is the case where α moves overtly and β moves covertly, as in (63).

(63)*Order Preservation Case 2; α moves overtly and β moves covertly*
[$_{HP}$ α{[$_{uX}$ ~~X~~]} H{[$_{iX}$ **X**], [$_{iY}$ **Y**]} [$_{H'P}$ … $t_α$ … β{[$_{uY}$ ~~Y~~]} …]]

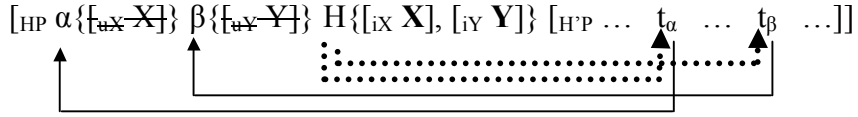
Scrambling of β is no longer available, so that it cannot precede α within HP. The third possibility is that α moves covertly while β moves overtly, which yields the structure in (64).

(64)*Order Preservation Case 3; α moves covertly while β moves overtly*



In this case, the order between α and β is reversed after feature-checking. However, this case is straightforwardly ruled out by Nissenbaum's (2000) mechanism. Since α is closer to H than β, H find α as a goal first, and moves it covertly. This means that spellout of H'P has already been applied until this point. Thus, the subsequent movement of β cannot be overt. Therefore, the structure in (64) is impossible. The last possibility is to move both α and β overtly. At this point, Richards' (2001) tucking-in condition plays an important role. Assuming the tucking-in condition, Nissenbaum (2000) claims that the closer element moves first, and the second movement tucks the constituent in the lower Spec position. This case is illustrated in (65).

(65)*Order Preservation Case 4; both α and β undergo overt movement*



As a result of tucking-in, the closer element α still precedes β after the feature-checking. Therefore, in all cases the ordering of elements within HP can be preserved. Given a natural assumption that the HP which executes spellout is CP, there is no position to scramble higher than it except for the case where it is embedded, there is no way to alter the ordering of relevant phrases. Here, we have the answer to the question in (8a), repeated here as (66).

(66) Why the surface order of *wh*-phrases and SBEs is crucial to the grammaticality of a sentence, given the optionality and the radical reconstruction property of scrambling?

The answer is; surface order is crucial because whether feature checking can obey the Valuation Condition relies on the IP-internal order, and the IP-internal order cannot be changed by feature-checking itself. In addition, scrambling either before or after feature checking is impossible. In this way, Nissenbaum (2000) and Richards (2001) provide the solution to answer the question in (66). This in turn supports for their theory because their arguments are constructed on independent facts.

Let us summarize this section. First, we illustrated that the feature specification (41) and the Valuation Condition (42) can derive the effects of the generalization (36), answering the question in (8b) and (8c). The answer is that the features which SBEs and 'why' have constitute only the proper subset of those which the ordinary *wh*-phrases have. Second, we showed that the undesirable scrambling problem can be partially solved by Pesetsky and Torrego's (2004) proposal. Finally, we provided the full answer to the question in (8a), solving the residue of the undesirable scrambling problem, by assuming Nissenbaum (2000) and Richards (2001).

4. Extension to Some Complex Cases

In this section, we extend the proposed mechanism to some more complex cases. First, we show that the case which forces Ko (2006) to adopt the split-CP system can be explained, without recourse to the split-CP system. Second, an apparent counterexample of the intervention effect is discussed.

4.1 Ko's Motivation for the Split-CP System

This subsection argues that Ko's (2006) motivation for the split-CP system can be explained by the proposed mechanism which employs the single-CP system. Look at the example in (17a), repeated here as (67).

(67) ?*Taroo-sika nani-o naze tabe-nakat-ta no?
-only what-Acc why eat-not-Past Q

'Why did only Taroo eat what?'

Recall that under the CHM with single-CP system, (67) has the following structure.

(68) $[_{CP}$ SBE_i wh_j 'why' C $[_{IP}$ … t_i … t_j …]]

Since 'why' is base-generated into Spec, CP, the fact the SBE and the *wh*-phrase precedes 'why' indicates that they are scrambled to the positions which are higher than Spec, CP. In this structure, the SBE does not block the checking relation between the *wh*-phrase and the C head, so that it is wrongly predicated that the relevant example is grammatical. Thus, Ko (2006) abandons the single-CP system.

Let us consider how the proposed analysis rules out the example in (67). The important feature of the analysis is that the ordering of the relevant constituents is preserved. In other words, the surface order reflects the IP-internal order. Hence, the example has the following structure at the point where the C head is introduced to the derivation.

(69) $[_{CP}$ C{$[_{iQ}$], $[_{iF}$]} $[_{IP}$ … SBE{$[_{uF}$ F]} … *wh*{$[_{uQ}$ Q], $[_{uF}$ F]} … 'why'{$[_{uQ}$ Q]} …]

The derivation proceeds as follows.

(70)*Continuation of (69)*

a. Step 1; C probes its domain, and it finds the SBE as a goal[20]
$[_{CP}$ C{$[_{iQ}$], $[_{iF}$ **F**]} $[_{IP}$ … SBE{~~$[_{uF}$ F]~~} … *wh*{$[_{uQ}$ Q], $[_{uF}$ F]} … 'why'{$[_{uQ}$ Q]} …]

[20] In what follows, we concentrate on the cases where all elements undergo covert movement for ease of exposition.

b. Step 2; C probes its domain again, and it finds the *wh*-phrase as a goal
$[_{CP}$ C{$[_{iQ}$], $[_{iF}$ **F**]} $[_{IP}$ … SBE{$[_{\text{~~uF F~~}}]$} … *wh*{$[_{uQ}$ Q], $[_{uF}$ F]} … 'why'{$[_{uQ}$ Q]} …]
X

At the Step 2 in (70b), C cannot utilize $[_{uF}$ F] on the *wh*-phrase, since $[_{iF}$] on C has been already valued at the Step 1 in (70a). Therefore, the derivation crashes, violating the Valuation Condition. Thus, the example in (67) can be explained without recourse to the split-CP system.

4.2 An Apparent Counterexample of the Intervention Effect

In this subsection, we discuss an apparent counterexample of the intervention effect, where long-distance scrambling of an SBE interacts with a matrix *wh*-phrase. Look at the examples in (71), cited form Saito (2005).

(71)a. Soko-ni-sika$_i$ dare-ga $[_{CP}$ Taroo-ga t_i ik-anakat-ta to] Ziroo-ni it-ta no?
there-to-only who-Nom -Nom go-not-Past C -to say-Past Q

'Who said to Ziroo that it was only there that Taroo went?' (Saito 2005, p. 365)

b. Tookyoo-kara-sika$_i$ dare-ga $[_{CP}$ nimotu-ga t_i todok-anakat-ta to] Ziroo-ni it-ta no?
-from-only who-Nom luggage-Nom arrive-not-Past C -to say-Past Q

'Who said to Ziroo that it was only from Tokyo that luggage arrived?' (*ibid.*)

In these examples, the SBE undergoes long-distance scrambling to the matrix CP, and precedes the matrix *wh*-subject. This, they have the following schematic structure.

(72) $[_{CP}$ Q … SBE … *wh* $[_{CP}$ … t_{SBE} …]]

Although this should be the case of intervention effect, the examples are not ungrammatical.

The proposed mechanism, however, can deal with them. Look at the derivation in (73).

(73)a. Step 1; Formation of the embedded CP
$[_{CP}$ C{$[_{iF}$]} $[_{IP}$ … SBE{$[_{uF}$ F]} …]]

b. Step 2; Overt movement of the SBE to the embedded Spec, CP
$[_{CP}$ SBE{$[_{\text{~~uF F~~}}]$} C{$[_{iF}$ **F**]} $[_{IP}$ … t_{SBE} …]]

c. Step 3; Formation of the matrix IP
$[_{IP}$ … *wh*{$[_{uQ}$ Q], $[_{uF}$ F]} … $[_{CP}$ SBE{$[_{\text{~~uF F~~}}]$} C{$[_{iF}$ **F**]} $[_{IP}$ … t_{SBE} …]]…]

d. Step 4; Long-distance scrambling of the SBE
[IP … SBE{[uF ~~F~~]} … *wh*{[uQ Q], [uF F]} … [CP t'SBE … [IP … tSBE …]]…]

e. Step 5; Merge of the matrix C
[CP C{[iQ], [iF]} [IP … SBE{[uF ~~F~~]} … *wh*{[uQ Q], [uF F]} … [CP t'SBE]…]…]

f. Step 6; C probes its domain, and it finds the *wh*-phrase as a goal
[CP C{[iQ **Q**], [iF **F**]} [IP … SBE{[uF ~~F~~]} … *wh*{[uQ ~~Q~~], [uF ~~F~~]} …[CP t'SBE]…]…]

At the Step 1 in (73a), the embedded C head is introduced to the derivation with the optional feature [iF]. Then, at the Step 2 in (73b), the SBE moves overtly to Spec, CP. [uF F] on the SBE values [iF] on the embedded C, and [uF F] on the SBE is deleted. Note that this movement is not scrambling but overt movement, so that the uninterpretable feature can be deleted. At the Step 3 in (73c), the matrix IP is formed with the subject *wh*-phrase. At the Step 4 in (73d), the SBE, which is in the edge of the embedded CP, undergoes long-distance scrambling to the matrix IP-adjoined position.[21] At the Step 5 in (73e), the matrix C is merged. Then, in the Step 6, C probes its domain. What is crucial here is that [uF F] on the SBE has been already deleted until this step, so that the probe can skip the SBE. The probe finds the *wh*-phrase as the closest goal and values its own unvalued features, observing the Valuation Condition. Therefore, the derivation converges successfully, yielding the desirable word order.[22]

To sum up this section, we discussed the two cases; one is that a single clause contains an SBE, a *wh*-phrase and 'why',[23] and the other is the interaction of a *wh*-phrase in a higher

[21] We are still ignoring the *v**P phase.

[22] This analysis is consistent with Saito's (2003, 2005) analysis of long-distance scrambling in its spirit. Saito (2003, 2005) claims that long-distance scrambling is in fact movement of only phonetic features, which results from the deletion of other features in the previous steps. See Saito (2003, 2005) for details.

[23] Aono (2006) observes an interesting pattern of co-occurrence of the relevant items. Look at the example in (i).

(i) *Dono-gaka-sika naze sore-o kak-anakat-ta no?
which-artist-only why it-Acc paint-not-Past Q
'(Lit.) Why did only which artist paint it?'

In this example, the *wh*-phrase *dono-gaka* 'which artist' is combined with the NPI *-sika* 'only'. Although it precedes 'why', the sentence is ungrammatical. Under our proposals, there seems to be no way to exclude this example since C can be fully valued by the *wh*-phrase first and then it can check [uQ Q] on 'why'. We tentatively suggest that combination of a *wh*-phrase and an SBE causes some change to the feature specification of the amalgam, leaving the precise contents of such change open.

clause and an SBE which undergoes long-distance scrambling. We showed that the proposed mechanism can be extended to such complex cases.

5. Concluding Remarks

5.1 Major Results

In this paper, we discussed the word order restrictions among SBEs, *wh*-phrases, and 'why', which are rather unexpected in relatively free word order languages like Japanese. Through the discussion of these restrictions, we got the following major results. First, we gave a generalization which unifies the anti-superiority effect, and the intervention effect, and the exception of the intervention effect, and proposed an analysis which can capture the generalization. At the same time, arguing that it is necessary to solve the undesirable scrambling problem, and any theory which does not pay attention to this problem is inadequate, we developed the way to solve the problem. Second, we pointed out the analysis which employs the split-CP system has several problems, while the problems can be solved under the single-CP system. Finally, since the proposed mechanism crucially assumes that 'why' is base-generated within IP, the CMH cannot be tenable at least for Japanese.

Let us go back to the questions in (8), which we made in Section 1, repeated here as (74).

(74)a. Why the surface order of *wh*-phrases and SBEs is crucial to the grammaticality of a sentence, given the optionality and the radical reconstruction property of scrambling?

b. Why does *naze* 'why' behave differently from the other *wh*-phrases?

c. Why do SBEs induce the intervention effect?

We have the following answers; the answer to (74a): Surface order is crucial because under Pesetsky and Torrego's (2004) idea of feature interpretability and valuation, whether feature checking can obey the Valuation Condition relies on the IP-internal order. In addition, the IP-internal order cannot be changed by feature checking itself, given the proposals by Nissenbaum (2000) and Richards (2001). Further, scrambling either before or after feature checking is also impossible, given the proposed mechanism. Therefore, the IP-internal order is carried over to the surface order. The answer to (74b) is that *naze* 'why' differs from the other *wh*-phrases in that it lacks the focus feature. The answer to (74c): SBEs induce the intervention effect because their specifications of features which are checked by C are the proper subset of those of the ordinary *wh*-phrases, so that they always violate the Valuation Condition when they precede the ordinary *wh*-phrases.

5.2 A Speculation on the Status of the CMH and the Split-CP System

Finally, we make a brief speculation. Recall that under the Ko's (2005, 2006) original formulation, the CMH is a hypothesis for *wh-in-situ* languages including Japanese, Korean,

and Chinese. Yet, there are proposals which are akin to the CMH for not *wh-in-situ* languages; see Rizzi (1999) for Italian and Hornstein (1995) for English. The suggesting fact is that Chinese lacks the anti-superiority effect, as the contrast in (75) indicates.

(75)a. Zhangsan weishenme bu chi shenme (dongxi)?
why not eat what thing

'Why did Zhangsan not eat what?' (Ko 2006, p. 336)

b. ?*Zhangsan shenme dongxi weishenme bu chi?
what thing why not eat

'Why did Zhangsan not eat what?' (*ibid*.)

This fact can be explained if we assume that the CMH is true for Chinese and it lacks A'-scrambling, as Ko (2006) claims. Thus, we speculate that the CMH may be true for VO languages including Chinese, Italian, and English, not for *wh-in-situ* languages. In addition, recall that the split-CP system can generate the 'why'-*wh* order vacuously observing the Valuation Condition, as we have seen in (37). The relevant derivation is repeated in (76).

(76)a. Step 1; Suppose that C_1 and C_2 hosts the Q-feature and the focus feature separately[24]
$[_{CP2}\ C_2\{[_{iF}\ ]\}\ [_{CP1}\ C_1\{[_{iQ}\ ]\}\ [_{IP}\ \ldots\ \text{'why'}\{[_{uQ}\ Q]\}\ \ldots\ \textit{wh}\{[_{uQ}\ Q], [_{uF}\ F]\}\ \ldots]]]$

b. Step 2; C_1 probes its domain, and it finds 'why' as a goal
$[_{CP2}\ C_2\{[_{iF}\ ]\}\ [_{CP1}\ C_1\{[_{iQ}\ \mathbf{Q}]\}\ [_{IP}\ \ldots\ \text{'why'}\{\sout{[_{uQ}\ Q]}\}\ \ldots\ \textit{wh}\{[_{uQ}\ Q], [_{uF}\ F]\}\ \ldots]]]$

c. Step 3; The fully valued C_1 can check $[_{uQ}\ Q]$ on the *wh*-phrase
$[_{CP2}\ C_2\{[_{iF}\ ]\}\ [_{CP1}\ C_1\{[_{iQ}\ \mathbf{Q}]\}\ [_{IP}\ \ldots\ \text{'why'}\{\sout{[_{uQ}\ Q]}\}\ \ldots\ \textit{wh}\{\sout{[_{uQ}\ Q]}, [_{uF}\ F]\}\ \ldots]]]$

d. Step 4; C_2 probes its domain, and it finds the *wh*-phase as a goal
$[_{CP2}\ C_2\{[_{iF}\ \mathbf{F}]\}\ [_{CP1}\ C_1\{[_{iQ}\ \mathbf{Q}]\}\ [_{IP}\ \ldots\ \text{'why'}\{\sout{[_{uQ}\ Q]}\}\ \ldots\ \textit{wh}\{\sout{[_{uQ}\ Q]}, \sout{[_{uF}\ F]}\}\ \ldots]]]$

What is crucial here is the Step 3 in (76c). Since C_1 hosts only $[_{iQ}\ ]$, it can freely check the uninterpretable features without violating the Valuation Condition, once it is valued. Thus, the derivation converges, yielding the desirable word order. Thus, we speculate that in addition to English and Italian, Chinese also employs the split-CP system.[25] We further

[24] The hierarchical order of two C heads is not relevant.

[25] Everything else being equal, the proposed analysis predicts that if there is no anti-superiority effect in a language, the intervention effect is also absent. One problem of this approach is that Chinese in fact shows the intervention effect. I thank to Barry C.-Y. Yang for pointing out this fact. We hope to return this issue in future works.

speculate that the CMH and the split-CP system are related to the head-parameter; head-initial languages make use of the CMH and the split-CP system, while head-final ones are not.

Appendix: Some "Additional" Phenomena

1. Additional *Wh*-effect

In some circumstances, anti-superiority is evaded, as the contrast in (77) indicates.

(77)a. *Taroo-ga naze nani-o tabe-ta no?
-Nom why what-Acc eat-past Q

'Why did Taroo eat what?'

b. Dare-ga naze nani-o tabe-ta no?
who-Nom why what-Acc eat-Past Q

'(Lit.) Why did who eat what?'

If the subject is replaced to a *wh*-phrase as in (77b), the sentence becomes grammatical. This phenomenon is called the "additional *wh*-effect" (see A. Watanabe 1991, S. Watanabe 1994, Saito 1994, and references cited therein), because the additional *wh*-phrase remedies the anti-superiority effect. They have the following schematic structures.

(78) *[… 'why' … *wh* …] ➔ [ok]… wh_1 … 'why' …wh_2 …]

The proposed mechanism straightforwardly explains this observation. Look at the derivation in (79).

(79)a. Step 1; Merge of C
$[_{CP}$ C{[$_{iQ}$],[$_{iF}$]} $[_{IP}$ …wh_1{[$_{uQ}$ Q],[$_{uF}$ F]}…'why'{[$_{uF}$ F]}… wh_2{[$_{uQ}$ Q],[$_{uF}$ F]}…]]

b. Step 2; C probes its domain, and it finds wh_1 as a goal
$[_{CP}$ C{[$_{iQ}$ **Q**],[$_{iF}$ **F**]} $[_{IP}$ …wh_1{[$_{uQ}$ ~~Q~~],[$_{uF}$ ~~F~~]}…'why'{[$_{uF}$ F]}… wh_2{[$_{uQ}$ Q],[$_{uF}$ F]}…]]

c. Step 3; The fully valued C can check the uninterpretable features on 'why' and wh_2
$[_{CP}$ C{[$_{iQ}$ **Q**],[$_{iF}$ **F**]} $[_{IP}$ …wh_1{[$_{uQ}$ ~~Q~~],[$_{uF}$ ~~F~~]}…'why'{[$_{uF}$ ~~F~~]}… wh_2{[$_{uQ}$ ~~Q~~],[$_{uF}$ ~~F~~]}…]]

Recall that the surface order reflects the IP-internal order. Hence, the example in (77b) has the structure in the Step 1 in (79a) when the C head is merged. Then, C probes its domain and finds wh_1 as a goal. At this point, all the unvalued features on C can be valued. Therefore, the

subsequent feature checking can observe the Valuation Condition, so that the derivation can converge. In this way, the additional *wh*-effect can be explained.

2. New Observation; "Additional SBE Effect"

Here, we discuss a prediction of the proposed analysis and show that the prediction is borne out, providing a new observation. First, suppose that we have the configuration shown in (80a).

(80)a. Step 1; Merge of C
$[_{CP}\ C\{[_{iQ}\ \ ],\ [_{iF}\ \ ]\}\ [_{IP}\ \ldots\ SBE\{[_{uF}\ F]\}\ \ldots\ \text{'why'}\{[_{uQ}\ Q]\}\ \ldots\ wh\{[_{uQ}\ Q],\ [_{uF}\ F]\}\ \ldots]]$

b. Step 2; C probes its domain, and it finds the SBE as a goal
$[_{CP}\ C\{[_{iQ}\ \ ],\ [_{iF}\ \mathbf{F}]\}\ [_{IP}\ \ldots\ SBE\{\cancel{[_{uF}\ F]}\}\ \ldots\ \text{'why'}\{[_{uQ}\ Q]\}\ \ldots\ wh\{[_{uQ}\ Q],\ [_{uF}\ F]\}\ \ldots]]$

c. Step 3; C probes its domain, and it finds 'why' as a goal
$[_{CP}\ C\{[_{iQ}\ \mathbf{Q}],\ [_{iF}\ \mathbf{F}]\}\ [_{IP}\ \ldots\ SBE\{\cancel{[_{uF}\ F]}\}\ \ldots\ \text{'why'}\{\cancel{[_{uQ}\ Q]}\}\ \ldots\ wh\{[_{uQ}\ Q],\ [_{uF}\ F]\}\ \ldots]]$

d. Step 4; The fully valued C can check the uninterpretable features on the *wh*-phrase
$[_{CP}\ C\{[_{iQ}\ \mathbf{Q}],\ [_{iF}\ \mathbf{F}]\}\ [_{IP}\ \ldots\ SBE\{\cancel{[_{uF}\ F]}\}\ \ldots\ \text{'why'}\{\cancel{[_{uQ}\ Q]}\}\ \ldots\ wh\{\cancel{[_{uQ}\ Q]},\ \cancel{[_{uF}\ F]}\}\ \ldots]]$

At the next step in (80b), C can utilize all the valued features on the SBE, obeying the Valuation Condition. The subsequence step in (80c) also observes it, since 'why' lacks $[_{uF}\ F]$. Then, C is fully valued, so that its can check the uninterpretable features on the *wh*-phrase, violating nothing. Hence, the derivation converges. Therefore, the mechanism allows this type of ordering, that is SBE-'why'-*wh* or 'why'-SBE-*wh*. This prediction is borne out. Look at the examples in (81) and (82).

(81)*The SBE-'why'*-wh *Order*

a. Taroo-sika naze nani-o yoma-nakat-ta no?
-only why what-Acc read-not-Past Q

'Why did only Taroo read what?'

b. Taroo-sika naze sono hon-o yoma-nakat-ta no?
-only why that book-Acc read-not-Past Q

'Why did only Taroo read that book?'

(82)*The 'why'-SBE*-wh *Order*

a. Naze Taroo-sika nani-o yoma-nakat-ta no?
why -only what-Acc read-not-Past Q

'Why did only Taroo read what?'

b. Naze Taroo-sika sono hon- o yoma-nakat-ta no?
why -only that book-Acc read-not-Past Q

'Why did only Taroo read that book?'

In these examples, (81b) and (82b) are the cases of the exception of the intervention effect. There is no significant difference in grammaticality between (81a) and (81b), and (82a) and (82b), respectively.

In particular, the case of (81) is interesting. Note that in (81a), if the subject is not an SBE, the sentence should be ruled out as an instance of anti-superiority. That is, the anti-superiority effect can be remedied by an additional SBE, as illustrated in (83a).

(83)a. *[… 'why' … *wh* …] ➔ ^{ok}[… SBE … 'why' … *wh* …]

b. *[… 'why' … *wh* …] ➔ ^{ok}[… wh_1 … 'why' … wh_2 …]

The situation is reminiscent of the additional *wh*-effect (78), repeated here as (83b). Thus, we call this phenomenon the "additional SBE effect".

References

Aono, M. (2006) "Wh-phrases, Negative Polarity Items, and Anti-Superiority Effects in Japanese," paper read at the Hyderabad-Nanzan Workshop, held at Nanzan University, October 2006.

Aoyagi, H. (1994) "On Association with Focus and Scope of Focus Particle in Japanese," *MIT Working Papers in Linguistics* 24, 23-44.

Beck, S. (1996) "Quantified Structures as Barriers for LF Movement," *Natural Language Semantics* 4, 1-56.

Beck, S. and S.-S. Kim. (1997) "On *Wh*- and Operator Scope in Korean," *Journal of East Asian Linguistics* 6, 339-84.

Bošković, Ž. and D. Takahashi. (1998) "Scrambling and Last Resort," *Linguistic Inquiry* 29, 347-66.

Bromberger, S. (1992) *On What We Know We don't Know*. The University of Chicago Press.

Chomsky, N. (1973) "Conditions on Transformations," in S. Anderson & P. Kiparsky, eds., *A Festschrift for Morris Halle*, Holt, Rinehart and Winston, New York, 232-86.

Chomsky, N. (2000) "Minimalist Inquiries: The Framework," in R. Martin et al., eds., *Step by Step: Essays on Minimalist Syntax in Honor of Howard Lasnik*, MIT Press, Cambridge, Mass., 89-151.

Chomsky, N. (2001) "Derivation by Phase," in M. Kenstowicz, ed., *Ken Hale: A Life in Language*, MIT Press, Cambridge, Mass., 1-52.

Fukui, N. (1986) *A Theory of Category Projection and its Applications*, Ph.D. dissertation, MIT.

Harada. K. (1972) "Constraints on WH-Q Binding," *Studies in Descriptive and Applied Linguistics* 5, 180-206.

Huang, C.-T. J. (1982) *Logical Relations in Chinese and the Theory of Grammar*, Ph.D. dissertation, MIT.

Hornstein, N. (1995) *Logical Form*. Blackwell, Oxford.

Kawamura, T. (2001) *A Feature-Checking Analysis of Japanese Scrambling*, MA thesis, Nanzan University.

Kawamura, T. (2006a) "Focal Effect in Causal *Wh*-questions," ms., Stony Brook University.

Kawamura, T. (2006b) "The Causal *Wh*-phrases *Naze* in Japanese Cleft Constructions," ms., Stony Brook University.

Kim, S.-S. (2002) "Intervention Effects are Focus Effects," *Japanese/Korean Linguistics* 10, 615-28.

Kitahara, H. (1997) *Elementary Operations and Optimal Derivations*, MIT Press, Cambridge, Mass.

Ko, H. (2005) "Syntax of *Why-in-situ*: Merge into [Spec, CP] in the Overt Syntax," *Natural Language and Linguistic Theory* 23, 867-916.

Ko, H. (2006) "On the Structural Height of Reason *Wh*-Adverbials: Acquisition and Consequences," in L. Cheng & N. Corver, eds., Wh-*movement: Moving on*. MIT Press, Cambridge, Mass., 319-49.

Kuroda, S.-Y. (1988) "Whether We Agree or Not: A Comparative Study of English and Japanese," in W. Poser, ed., *Papers from the Second International Workshop on Japanese Syntax*, CSLI Publications, Stanford, 103-43.

Miyagawa, S. (1997) "Against Optional Scrambling," *Linguistic Inquiry* 28, 1-25.

Miyagawa, S. (2001) "EPP, scrambling, and wh-in-situ," in M. Kenstowicz, ed., *Ken Hale: A Life in Language*, MIT Press, Cambridge, Mass., 293-338.

Nissenbaum, J. (2000) *Investigations of Covert Phrase Movement*. Ph.D. dissertation, MIT.

Pesetsky, D. and E. Torrego. (2004) "The Syntax of Valuation and the Interpretability of Features," ms., MIT and University of Massachusetts.

Richards, N. (2001) *Movement in Language*. Oxford University Press, Oxford.

Rizzi, L. (1990) *Relativized Minimality*. MIT Press, Cambridge, Mass.

Rizzi, L. (1997) "Fine Structure of the Left Periphery," in L. Haegeman, ed., *Elements of Grammar*, Kluwer, Dordrecht, 281-337.

Rizzi, L. (1999) "On the Position of 'Int(errogative)' in the Left Periphery of the Clause," ms., Università di Siena.

Saito, M. (1985) *Some Asymmetries in Japanese and Their Theoretical Implications*, Ph.D. dissertation, MIT.

Saito, M. (1989) "Scrambling as Semantically Vacuous A'-movement," in M. Baltin and A. Kroch, eds., *Alternative Conceptions of Phrase Structure*, the University of Chicago Press, Chicago.

Saito, M. (1994) "Additional-*wh* Effects and the Adjunction Site Theory," *Journal of East Asian Linguistics* 3, 195-240.

Saito, M. (2003) A Derivational Approach to the Interpretation of Scrambling Chains, *Lingua* 113, 481-518.

Saito, M. (2004) "Some Remarks on Superiority and Crossing," in H.-J. Yoon, ed., *Generative Grammar in a Broader Perspective*, Hankook, Seoul, 571-95.

Saito, M. (2005) "Further Notes on the Interpretation of Scrambling Chains," in J. Sabel & M. Saito, eds., *The Free Word Order Phenomenon*, Mouton de Gruyter, New York, 335-76.

Saito, M. and N. Fukui. (1998) Order in Phrase Structure and Movement, *Linguistic Inquiry* 29, 439-74.

Sugisaki, K. (2001) Scrambling of Adjuncts and Last Resort, *Japanese/Korean Linguistics* 9, 379-89.

Watanabe, A. (1991) *Wh*-in-situ, Subjacency, and Chain Formation, ms., MIT.

Watanabe, S. (1994) (Anti-) Superiority as Weak Crossover, *MIT Working Papers in Linguistics* 24, 393-411.