Some Remarks on the Coordinate Structure Constraint

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1. Introduction
Ross (1967) proposes the Coordinate Structure Constraint (henceforth CSC).

(1) The Coordinate Structure Constraint (CSC)
In a coordinate structure, no conjunct may be moved, nor may any element contained in a conjunct be moved out of that conjunct.          (Ross 1967: 89)

As (1) shows, the CSC consists of two parts of statements. One is “no conjunct may be moved”. The ungrammatical sentences in (2) fall under this part because in (2), one of the conjoined elements, that is, what is extracted. The other is “nor may any element contained in a conjunct be moved out of the conjunct”. The ungrammatical sentences in (3) are ruled out by this part. What is extracted in (3) is not a conjoined element, but an element embedded in the phrase which is conjoined.

(2) a. *What1 did John eat apples and t1?
    b. *What1 did John eat t1 and apples?

(3) a. *What1 did John eat apples and drink t1?
    b. *What1 did John drink t1 and eat apples?

It is well known that Across-the-Board movement (henceforth ATB movement), which seems to be a counter example, extracts an element out of the both conjuncts, without violating the CSC, as shown in (4).

(4) What1 did [TP John [VP [VP buy t1] and [VP drink t1]]]?

Munn (1993) and Hornstein and Nunes (2000:13) suggest that the Parallelism Requirement, which requires that conjuncts be semantically “similar”, is imposed on coordinated structures. Specifically, Hornstein and Nunes assume that this semantic requirement is analyzed as a bare output condition at C-I interface. The examples in (2) and (3) fall under the Parallelism Requirement because one of the conjuncts involve a variable but the other does not. A natural explanation can be given to the grammaticality of (4) because both of the conjuncts involve the variables. If this type of analysis goes in the right direction, we do not have to posit the CSC as a syntactic constraint.
In this paper, I address the following question: Is the CSC necessary as a syntactic island? I argue that the answer is negative. I provide evidence suggesting that there are some cases which the Parallelism Requirement cannot rule out.

Specifically, I am wondering whether a distinct element can be extracted from some phrases which are conjoined, as shown in (5).

(5) \[ X \quad Y \quad [t_X \quad \text{and} \quad t_Y] \]

The movement in (5) behaves like ATB movement in that each conjunct involves a gap but the crucial difference is that in the case of ATB movement, extracted elements are identical elements while in (5), distinct elements are extracted. If (5) is permitted, then I can put forward the idea that the CSC can be eliminated as a syntactic constraint. I investigate whether the derivation illustrated in (5) is possible, considering Quantifier Raising at LF.

2. QR and CSC

As discussed in May (1985: 59), Ruys (1993), among others, QR is subject to the CSC. The relevant example is given in (6).

(6) A (different) student likes every professor and hates the dean. (a > every, *every> a)

In (6), the object quantified NP every professor cannot take wide scope over the subject. In order to take wide scope over the subject, the object quantified NP must undergo QR, as follows.

(7) \[ \text{CSC violation} \]

In (7), the relevant movement violates the CSC. The ungrammaticality shows that QR obeys the CSC. However, interestingly, the following example seems to violate the CSC.

(8) A (different) student [likes every professor,] and [wants him, to be on his committee].

Ruys (1993) observes that if a bound pronoun is in one of the conjunct, the quantified
expression in the other conjunct can take wide scope over the subject QP. Example (8) involves the pronoun *him* in the second conjunct, and *every professor*, which is in the first conjunct, can take wide scope over the subject *a (different) student*. The contrast in (9) suggests that an apparent violation of the CSC is observed in the case of *wh*-in-situ.

(9) a. *Which student likes which professor and hates the dean?*
   
   b. Which student likes which professor and wants him to be on his committee?  
   
   (Fox 2000:53)

Next, consider the following example.

(10) A student [respects every professor] and [hates every associate professor].

   (a> every, *every> a)

In (10), the conjoined elements are VP, which involves a quantified expression, respectively. Interestingly, (10) is unambiguous. The subject indefinite can take a wide scope over the object but the object quantifier cannot take wide scope over the subject. In order for the objects to take wide scope over the subject quantifier, both quantifiers must move out of the coordinated structure, as shown in (11).

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1 Fox (2000) gives an account to these facts, on the following assumptions.

(i) a. Extraction out of a coordinate structure is possible only when the structure consists of two independent substructures, each composed of one of the coordinates together with material above it up to the landing site (henceforth, *component structures*).

   b. Grammatical constraints are checked independently in each of the component structures.

   (Fox 2000: 50)

Under these assumptions, when the object takes wide scope, (6) and (8) have the following component structure, respectively.

(ii) every professor₁ a (different) student likes t₁

   every professor₁ a (different) student hates the dean.

(iii) every professor₁ a (different) student [[likes t₁]

   every professor₁ a (different) student [wants him₁ to be on his committee]].

In (iii), *every professor* binds the variable in the first conjunct but the second conjunct violates the constraint against vacuous quantification, which leads to the ungrammaticality. In contrast, (iii) does not violate anything because in the second conjunct, *every professor* binds the bound pronoun *him*. I will leave the discussion of Fox’s approach for future research.
(11) [[every professor]₁ [every associate professor]₂

[TP a student respects t₁ and hates t₂]]

What rules out the derivation given in (11)? The Parallelism Requirement would allow the derivation in (11) because the both conjuncts have variables and hence they are semantically similar. In contrast, the CSC in (1) can rule out the derivation in (11) because elements are extracted out of the conjoined phrases. In order to rule out the derivation given in (11), I propose that the CSC rules out the derivation given in (11). However, the CSC in (1) rules out the derivations where the object takes wide scope over the subject in (8), as it is. I reformulate the second part of the CSC as follows.

(12) The second part of the Coordinate Structure Constraint (Revised)
Extraction of elements out of both conjuncts is not possible.

According to (12), if a sentence has extraction out of both conjuncts, then the sentence will be ruled out. If a sentence has extraction out of one of the conjuncts, then the sentence cannot be ruled out by (12). In other words, under the present analysis, the interpretation in (7) where objects take wide scope over subjects is not ruled out by (12) because they involve extraction out of one of the conjuncts, that is, the first conjunct. I propose that they are ruled out independently from the revised CSC. I suggest that they are ruled out by the Parallelism Requirement.

I have to consider the case of ATB movement because (12) rules out ATB movement wrongly. Following Munn (1993), I assume that ATB movement involves operator movement, not literal “across the board” movement. Munn (1993) analyzes (13a) as (13b).

(13) a. I wonder who Jane detests and Harry adores.
   b. I wonder [CP who₁ [IP [IP Jane detests t₁] [ConjP Op [Con'j and Harry adores e₁]]]].

Under Munn’s analysis, the null operator is base-generated in the second conjunct and moves to the [Spec, ConjP], from where it can be licensed by the overt operator. Munn (1993) argues that his theory gives a straightforward account to the following binding asymmetry.

(14) Which picture₁ of himself/*herself did John paint t₁ [Op [and Mary buy e₁]]?

Under ATB movement analysis, it is not clear why himself is allowed while herself is not allowed.
Furthermore, the present analysis is consistent with Bošković and Franks’s (2000) claim that there is no ATB movement at LF because the present analysis does not allow ATB movement itself.

(15) a. Some boy hugged every girl and kissed every girl.
   b. Some delegate represented every candidate and nominated every candidate.

(Bošković and Franks 2000: 114)

In (15a) and (15b), the object quantified NP every girl/every candidate cannot take wide scope over the subject existentially quantified NP. If the object quantified NP could undergo QR in the ATB fashion as shown in (15), the wide scope reading of the object Quantified NP would be possible.

(16) a. [TP every girl1 [TP some boy [hugged t1] and [kissed t1]]]
   b. [TP every candidate1 [TP some delegate [represented t1] and [nominated t1]]]

However, this is not the case. This fact supports the claim that there is no ATB movement at LF.

I have discussed the case where elements are extracted out of the conjoined elements. Next, I turn to the case of the extraction of the conjoined elements, as shown in (2), repeated as (17).

(17) a. *What1 did John eat apples and t1?
   b. *What1 did John eat t1 and apples?

In (17), what is an element which is directly coordinated with the other NP. I suggest that the ungrammatical sentences in (17) are ruled out by the Parallelism Requirement, like the derivation where the object takes wide scope over the subject in (7). In what follows, I consider whether distinct elements are both extracted in the following way.

(18) X Y [ tx and ty ]

First, consider the following example.

(19) A student respects John and every associate professor. (a > every, *every> a)

In (19) the object quantified NP every associate professor cannot take wide scope over the subject existentially quantified NP. This shows that QR is subject to the first part of
Ross’s CSC. In order to take wide scope over the subject, the object quantified NP must undergo QR, as follows.

\[(20) \quad [\text{TP every associate professor}_1 [\text{TP a student respects [John and } t_1]]]

Ross’s CSC violation

Keeping this discussion in mind, consider the following example.

(21) A student respects [every professor] and [every associate professor].

\[(a > \text{every, every} > \text{a})\]

Example (21) is ambiguous. One reading is that the subject indefinite takes wide scope over the object quantifiers. Crucially, (21) has the other reading where the object quantifier \textit{every professor} and \textit{every associate professor} take wide scope over the subject quantifier. I assume that (21) has the derivation, given in (22).

\[(22) \quad [[\text{every professor}_1 [\text{every associate professor}_2 [\text{TP a student respects [} t_1 \text{ and } t_2]]]]

Example (21) has the interpretation given in (23b), not (23a).

\[(23) \quad \begin{array}{l}
a. \text{For every professor } x, \text{ there is a student } z \text{ such that } z \text{ respects } x \text{ and for every associate professor } y, \text{ there is a student } w \text{ such that } w \text{ respects } y. \\
b. \text{For every professor } x, \text{ there is a student } z \text{ such that } z \text{ respects } x \text{ and for every associate professor } y, \text{ there is a student } z \text{ such that } z \text{ respects } y.
\end{array}\]

In (23b), each pair of a professor and an associate professor must have a single student. The representation in (22) gives this interpretation straightforwardly. That’s why I assume that (21) has the derivation in (22). However, the derivation in (22) violates the first part of the CSC in (1). I would like to put forward the idea that the first part of the CSC in (1) can be eliminated.

3. Concluding Remarks

In this paper, I have argued that the second part of the CSC is syntactically motivated and reformulated the second part of the CSC. Furthermore, I have put forward the idea that the first part of the CSC in (1) is eliminated. Typical CSC violation like (2-3) fall under the Parallelism Requirement. Before closing the paper, I would like to mention a residual issue.
Merchant (1999) classifies several islands into PF-islands and LF-islands, based on the repair of the island violation. Specifically, he claims that the first part of the CSC is a PF-island and the second part of the CSC is an LF-island. As discussed in Ross (1969), Chung et al. (1995), among others, sluicing seems to violate the first part of the CSC. The relevant examples are as follows.

(24)   a. ?Irv and someone were dancing together, but I don’t know who.  
       (Ross 1969: 276)

       b. ?They persuaded Kennedy and some other senator to jointly sponsor the legislation, but I can’t remember which one.     (Chung et al. 1995: 273)

The counterparts of (24), which do not involve sluicing, exhibit the island violation, as follows.

(25)   a. *Irv and someone were dancing together, but I don’t know who. Irv and t₁ were dancing together.

       b. *They persuaded Kennedy and some other senator to jointly sponsor the legislation, but I can’t remember which one. they persuaded Kennedy and t₁ to jointly sponsor the legislation.

Merchant argues that the contrast between (24) and (25) is accounted by assuming that the first part of the CSC applies at PF component, not in the narrow syntax. In (25), wh-phrases undergo movement, leaving traces within the island. The traces lead to the ungrammaticality of (25). In (24), the traces are deleted with sluicing. Thus, the sentences in (24) are grammatical. If the first part of the CSC applied in the narrow syntax, then the contrast between (24) and (25) would not be expected.

Next, turn to the second part of the CSC. Merchant (1999) argues that the second part of the CSC is an LF-island because sluicing does not repair the island violation. The relevant example is given in (26), which has the derivation given in (27).

(26) *No farmer sold his farm and moved to a certain town- I don’t remember which.  
       (Merchant 1999: 266)

(27) No farmer sold his farm and moved to a certain town  
    - I don’t remember which₁ [no farmer sold his farm and moved to t₁].

If the second part of the CSC applied at PF component, then (26) would be repaired like

\(^2\) According to Merchant’s classification, the first part of the CSC, the Left Branch Condition and the Subject Condition are PF-islands while the second part of the CSC and the Complex NP Constraint are LF-islands. See also Sugisaki and Nomura (to appear) for further interesting evidence for this classification in terms of LF phenomena.
(24). However, it is not the case. Merchant (1999) argues that the second part of the CSC is an LF-island.

The fact that the violation of the second part of the CSC cannot be repaired by sluicing is consistent with the present discussion because the Parallelism Requirement is violated, regardless of sluicing at PF. However, the fact that the violation of the first part of the CSC can be repaired by sluicing raises a problem to the present discussion. The sentences in (24) still violate the Parallelism Requirement, even if the illegitimate trace is deleted at PF. I will leave this issue for future research.

References